

# THE BOOK OF ABSTRACTS



17th International  
and 59th Polish Conference

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Dear Colleagues,

on behalf of Students' Scientific Association at the Medical University of Lodz it is my pleasure to meet you at the 59th Polish and 17th International Conference Juvenes Pro Medicina 2021. This year, Juvenes Pro Medicina Conference for Students and Young Doctors brought together almost 400 active participants, which is a remarkable success. This is of the utmost importance in the year of global SARS-CoV2 pandemic. Due to the common work of Organising Committee, International Affairs Team and IT Group, we were able to host the Juvenes Pro Medicina 2021 completely on-line.

The 2021 edition of JPM is about to be the 17th international conference organized by the Students' Scientific Association. Each year, we are facing new challenges, which only motivates us to push ourselves to the limits. This year, despite the tense international restrictions, especially concerning the international travel, we were able to provide Keynote Lectures in greater scale than ever before, hosting 5 international guests. With your support, we have also reached over 700 submitted abstracts. As a result, we have opened 32 student sessions, during which young researchers presented their works!

The objective of our conference is to create an international, scientific event for young scientists, where they can share and present their best work. Juvenes Pro Medicina addresses the challenges and opportunities in different medical fields and brings together young students, scientists and doctors to exchange, debate and network. The conference is held in Łódź, Poland, the 3rd largest Polish city, and has its own unique industrial atmosphere. We have confidence you will find the conference stimulating and rewarding.

A handwritten signature in cursive script, reading "Katarzyna Knes".

President of Juvenes Pro Medicina 2021

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## **ANESTHESIOLOGY AND EMERGENCY MEDICINE**

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## **Automated cardiopulmonary resuscitation device for pre-hospital cardiac arrest: a single-centre experience of AutoPulse-CPR, Anesthesiology and Emergency Medicine**

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**Tutor:** MD PhD Dzintra Jakubaņeca

**Introduction:** A low quality of cardiopulmonary resuscitation (CPR) predicts adverse outcome. The usage of A-CPR following out-hospital cardiac arrest remains poorly described. Two automatic mechanical chest compression devices – LUCAS and AutoPulse – have been used in Latvia in order to optimize the circulation in patients with cardiac arrest. Objective.

**Aim of the study:** To determine the implementation and effectiveness of LUCAS and AutoPulse for out-of-hospital cardiac patients in Latvia.

**Material and methods:** A retrospective cross-section study was carried out, involving adult patients with out-of-hospital cardiac arrest with sustained circulatory arrest. The data from State Emergency Service of Latvia regarding the patients resuscitated with mechanical chest compression device – AutoPulse was used in the study.

**Results:** From May 2016 to December 2018, 232 patients, 182 (78.4 %) of those men and 50 (21.6 %) women ( $p < 0.001$ ) were resuscitated with AutoPulse. The median age for women was 62.5 (12.0–92.0) years and 59.0 (17.0–88.0) for men ( $p = 0.101$ ). Of those patients, in 70/232 (30.2 %) cases the return to spontaneous circulation and a successful admission to the hospital, 59/70 (84.3 %) were male and only 11/70 (15.7 %) were women. The median age (min-max) of patients who had survived was 58.50 (17–92) years, but in patients' group who died, the median age 60.0 (12–88) years ( $p = 0.375$ ). The aetiologies of cardiac arrest were followed: unknown cause 126/232 (54.31), the second most common cardiac arrest reason was an acute myocardial infarction in 44/232 (19 %) cases, and Chronic Ischemic heart disease in 23/232 (9.9 %) cases, while non-cardiogenic cause was present in 39/232 (17 %) cases. 68.2 % (30/44) of the patients with myocardial infarction and 14/23 (60.9 %) of the patients with the diagnosis CIHD ( $p = 0.549$ ) experienced the return of spontaneous circulation and were admitted to hospital. The most common location of cardiac arrest was found to be a patient's residence – 137 (59.1 %) cases, and 95 (40.9 %) – in public places.

**Conclusions:** AutoPulse is effectively used in Latvia and the study shows a positive outcome. Acknowledgements. The authors declare the absence of the conflict of interest."

## Chronic pain and cognitive functioning in elderly patients

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**Presenting author:** Weronika Hajec

**Tutor:** Prof. Marta Muszalik

**Introduction:** Pain, as defined by the International Society for the Study of Pain, is defined as an unpleasant sensory and emotional experience related to actual or potential damage to the body. Chronic pain is pathological pain, the symptoms of which last continuously or recur continuously at certain times of the day for at least 3 months. Chronic pain is often defined as a disease in itself that requires multidirectional therapeutic management.

**Aim of the study:** The aim of the study was to present the relationship between chronic pain in the elderly and their cognitive functioning.

**Material and methods:** The study involved 40 people, 7 men and 33 women, over 60 years of age. The research was conducted in the Geriatrics Clinic of University Hospital No. 1 in Bydgoszcz. The prevalence of chronic pain was assessed. The intensity of chronic pain was assessed using the 11-point Numerical Rating Scale (NRS). Cognitive functioning was assessed using two screening scales: MoCa (Montreal Cognitive Assessment) and MMSE (Minimental State Examination). Statistical analysis was performed using the Statistica 13.3 software.

**Results:** The studies showed that 45% of the study participants suffered from chronic pain that lasted more than 3 months. Along with the increase in pain intensity on the NRS scale, the cognitive functioning of the elderly worsened on the MoCa scale ( $r = -0.4982$ ,  $p = 0.0012$ ). A similar trend was observed in cognitive functioning when assessed with the MMSE scale ( $r = -0.1719$ ,  $p = 0.2955$ ).

**Conclusions:** Patients with chronic pain scored worse in tests assessing cognitive functioning, which may have an impact on their functioning in everyday life. The severity of cognitive dysfunction depends on the severity of pain. It seems that an effective analgesic treatment is an important role in limiting the progression of cognitive dysfunction. Chronic pain, as a huge problem among the elderly, requires further research into the influence of chronic pain on cognitive functioning.

## **Does experience of the intubator affect aerosol and droplet generation during intubation: a simulation study**

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**Presenting author:** Edvards Kalnins

**Tutor:** Marta Silina

**Introduction:** COVID-19 pandemic is affecting many countries all over the globe. All the efforts are given to limit the spread of pandemic, including medical staff being infected when treating patients. For COVID-19 patient management, intubation may be needed, which also is an aerosol and droplet generating procedure. It can promote virus spread via contact, droplet or aerosolization routes. It is advised that intubation is performed by an experienced intubator as it allows better visualisation of the vocal cords and shorter intubation time thus decreasing aerosol and droplet generation time.

**Aim of the study:** The aim of this study was to examine the extent of contact contamination, droplet spread and aerosolization that occur during intubation in a mannequin study and to compare the results between an experienced intubator and a young doctor.

**Materials and methods:** In the experiment an atomiser device containing luminescent fluid was placed into Laerdal Airway mannequin's pharynx. An experienced intubator and a young doctor intubated the mannequin 5 times each using a videolaryngoscope while 0.5 mls of luminescent fluid was sprayed through atomiser. The droplet spread and contact contamination after intubation were visualised using ultraviolet light and standardized photographs taken. The extent of spread was evaluated using a 4-point Likert scale (0 to 3) by two independent observers. To assure the reliability of the results, the Cohen  $\kappa$  coefficient of interrater reliability between the 2 examiners was calculated.

**Results:** For experienced intubator contact contamination and droplet spread was 1(0-1) and 2(1-2). For young doctor the results were 2,5(2-3) and 1(0-1) for contact contamination and droplet spread, accordingly. The Cohen  $\kappa$  coefficient was 0.6, which demonstrated substantial agreement between examiners.

**Conclusions:** Less contact contamination was observed with experienced practitioner. Intubation done by young doctor resulted in less droplet spread.



## Evaluation of mechanical power changes during continuous mechanical ventilation

Justina Krauklyte  
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**Presenting author:** Justina Krauklyte

**Tutor:** Prof. Saulius Vosylius

**Aim of the study:** Aim of this study was to calculate and evaluate ventilator generated MP during 12-24h ventilation with pressure controlled ventilation (P-CMV) and automatically adjustable ventilation (Intellivent-ASV).

**Material and methods:** Mechanical ventilation data was obtained from Hamilton S1 ventilator database. Mechanical power was calculated using using 2 formulas reported in the literature: extended equation, where  $MP = 0.098 \cdot RR \cdot VT \cdot (\Delta P_{insp} + PEEP)$ , and surrogate equation, where  $MP = 0.098 \cdot RR \cdot VT \cdot (PEEP + \Delta P_{insp} \cdot (1 - e^{-T_{insp}/R \cdot C}))$ .

**Results:** Our study included mechanical ventilation data of 9 patients (5 cases with acute respiratory distress syndrome). Median of calculated MP's was as follows (according to extended and surrogate equations): 10.1 [5.5; 26.9] and 8.7 [4.6; 24.1]; 21.5 [14.9; 32.3] and 19.7 [13.4; 26.9]; 17.6 [2.8; 52.4] and 12.7 [2.8; 38.2]; 24.4 [10.1; 47.1] and 16.0 [8.1; 39.2]; 9.6 [3.4; 17.7] and 9.3 [3.4; 16.5]; 22.1 [12.1; 40.4] and 18.5 [8.8; 36.2]; 30.5 [21.8; 46.9] and 29.3 [18.2; 43.8]; 22.7 [8.1; 38.9] and 19.8 [7.4; 36.2].

**Conclusions:** Quantitative values of MP generated by mechanical ventilation varies depending on the ventilation method used and patient's condition. Unfortunately, yet there is no the possibility to evaluate obtained results, as there are no threshold of safe MP in humans.

## Glycemic Variability in Critically ill

Alicja Kalemba, Cezary Kapfan, Monika Krok  
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**Presenting author:** Alicja Kalemba

**Tutor:** Prof. Łukasz Krzych

**Introduction:** Non-diabetic hyperglycemia is a dangerous metabolic phenomenon and may occur in up to 38% of subjects treated in the intensive care unit. Inattentive treatment of glycemic disorders, causing its fluctuations and hypoglycemic episodes, is a serious health hazard promoting negative outcomes. Thus, glycemic variability has become an important clinical prognostic marker.

**Aim of the study:** The aim of our study was to assess the variability of glycaemia and its basic determinants, and to verify its relationship with mortality in patients hospitalized in a mixed ICU.

**Methods:** The medical records of 37 patients hospitalized between 13.01.2020 and 29.02.2020 were analyzed prospectively. According to local protocol, insulin therapy was started when the blood glucose (BG) in two measurements was  $\geq 200$  mg/dL and the insulin dose was adjusted to maintain BG within the range of 140-180 mg/dL. The BG variability during the stay was assessed using two definitions, i.e. (1) the value of standard deviation (SD) from all the measurements performed and (2) the coefficient of variation (CV).

**Results:** Insulin was used in 28 (75.7%) subjects. There was correlation between the BG variability and daily insulin dose (SD:  $R=0,559$ ;  $p<0.01$ ; CV:  $R=0,621$ ;  $p<0.01$ ). The median energy dose was 7820 (IQR 2126-14274 ) kcal/day. There was correlation between the BG variability and the total energy daily dose (SD:  $R=0,373$ ;  $p=0.02$ ; CV:  $R=0,364$ ;  $p=0.03$ ). Glycemic variability was higher among patients in whom treatment with adrenalin ( $p=0,0218$ ) or steroid ( $p=0,0292$ ) was applied. The BG variability, expressed using SD, was associated with ICU mortality (ROC=0,806; 95%CI 0,643-0,917;  $p= 0,0014$ ).

**Conclusions:** The BG variability in the ICU setting arises from the loss of balance between the supplied energy and the applied insulin dose, and may be associated with a worse prognosis.

## **BASIC SCIENCE 1**

**COORDINATORS:** Bartosz Lenda, Aleksandra Podwysocka

### **Jury**

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## **Sauropus androgynus Leaves Extract Prevent Cognitive Deterioration and Hippocampal Amyloid Beta 42 (A $\beta$ -42) Formation in Aluminium Chloride-induced Alzheimer Rat Model**

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**Presenting author:** Tungki Pratama Umar

**Tutor:** MD Rachmat Hidayat, MD Kemas Ya'kub Rahadiyanto

**Introduction:** Alzheimer's disease is a debilitating complex disorder affecting the brain. It is a part of the degenerative process and is estimated to affect approximately 46 million people by 2016. Nowadays, the perception of Alzheimer's disease as an "aging person" disease has shifted to a younger person, even in a productive period. This disease is associated with disturbance in metabolism, deposition, or protein clearance, specifically with amyloid-beta (A $\beta$ ). There is no cure for this disease until now.

Sauropus androgynus leaf is a product that can slow degenerative processes. Sauropus androgynus leaves have flavonoid as one of their key components. Its primary flavonoid, kaempferol, and quercetin have some neuroprotective profile by inhibiting the development of Reactive Oxygen Species (ROS), enhancing antioxidant enzymes, and preventing neuronal apoptosis mediated by A $\beta$ -42 neurotoxicity.

**Aim of Study:** This study aimed to investigate the influence of Sauropus androgynus leaves on the prevention of cognitive decline and A $\beta$ -42 expression in the hippocampal dentate gyrus of Alzheimer's disease model rats.

**Material and Methods:** The study was undertaken via an in vivo experimental study. Sauropus androgynus leaves are extracted by maceration for three days. In the meantime, the subjects of the study (thirty male Wistar rats) are divided into six groups, each consisting of five rats. Group 1: Normal control (no treatment), group 2: negative control, group 3: positive control (vitamin B12), group 4, 5 and 6 Sauropus androgynus leaves extract with doses of 75 mg/kgBW, 150 mg/kgBW and 300 mg/kgBW respectively for 28 days. Aluminum chloride (AlCl<sub>3</sub>) is used as an Alzheimer's disease-inducing agent in the treatment group (group 2-6). Cognitive function was assessed by a t-maze test, while Dentate Gyrus A $\beta$ -42 expression was examined by immunohistochemistry.

**Results:** Cognitive function evaluation by measuring the ratio of alternations on the first and 28 days of the study showed a considerable increase ( $p < 0.05$ ) in the group receiving Sauropus androgynus leaf extract at doses of 150 mg/kgBW and 300 mg/kgBW. Another assessment based on the pace at which the task was completed found that the groups receiving Sauropus androgynus leaf extract at doses of 150 mg/kgBW and 300 mg/kgBW had better completion times and significantly different ( $p < 0.05$ ) than the positive and negative controls. The A $\beta$ -42 expression found in the dentate gyrus also showed similar findings, i.e. a substantial positive difference ( $p < 0.05$ ) in all classes of Sauropus androgynus leaf extract compared to negative controls and positive controls.

## **The effect of human rhinovirus HRV-16 on enzyme expression of the arachidonic acid metabolic pathway in human pulmonary vascular endothelium**

Kinga Klimczak

Medical University of Lodz

**Presenting author:** Kinga Klimczak

**Tutor:** Prof. Maciej Chałubiński, MD Robert Szewczyk, MD Aleksandra Likońska

**Introduction:** Rhinoviral infections lead to exacerbation of asthma, worsening of the course of the disease, and a reduction in the quality of life. Eicosanoid synthesis is regulated by specific enzymes pathway, known as: phospholipase A2 (PLPA2), cyclooxygenases (COX1 and COX2), lipoxygenases (5-LO, 12-LO, 15-LO) and leukotriene synthases (LTA4S, LTB4S and LTC4S) in the arachidonic acid (AA) metabolic pathway. The involvement of cysteinyl-leukotrienes and prostanoids in asthma immunopathology is well understood in epithelial cells. However, little is known about the engagement of AA metabolic pathway enzymes and the production of eicosanoids by the lung vascular endothelial cells during the rhinoviral infection.

**Aim of the study:** To assess the effect of rhinovirus HRV16 on AA metabolic pathway enzyme expression in the human pulmonary vascular endothelium.

**Material and methods:** Human pulmonary microvascular endothelial cells (HMVEC-L) were incubated with HRV16 (MOI 3) for 3 hours. After virus removal, cells were further cultured for 5, 24 and 72 hours to analyze COX-2, 5-LOX, LTC4S, PLA2, and COX-1 in Real-Time PCR. RANTES mRNA expression was assessed as an indicator of efficient infection of HMVEC-L.

**Results:** HRV16 caused 10,6-fold and 3,9-fold increase of the mRNA expression of COX-2 at 24 and 72 hours in HMVEC-L. Similarly, the expression of 5-LOX at 24 hours was also increased (13.5-fold). However, HRV16 caused 0,5 and 0,3 decrease of LTC4S mRNA expression at 24 and 72 hours. Expression of PLPA2 at 24 and 72 hours was increased 2,7-fold and 1,5-fold. COX-1 showed a 2,3-fold increase in expression at 24 hours of the experiment. The efficient infection was confirmed by the observed increase mRNA expression for RANTES over 6000-fold at 24 and 5300-fold at 72 hours.

**Conclusions:** The regulation of AA metabolic pathway enzymes by HRV16 in the lung vascular endothelium suggests their possible involvement in the immunopathology of rhinoviral asthma exacerbations.

This study was funded by grants of Medical University of Lodz, Poland no. 564/1-000-00/564-20-044.

## The culture of *Dracocephalum ruyschiana* L. transformed shoots on agar media and in temporary immersion bioreactors

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**Presenting author:** Katarzyna Puternicka

**Tutor:** PhD Izabela Weremczuk-Jeżyna

**Introduction:** *Dracocephalum ruyschiana* L. (Lamiaceae) is a critically endangered species, wherefore it is a strict protection plant in Poland. It is known, that in traditional medicine are used of aerial parts of the species, in gastrointestinal diseases, hypertension, rheumatoid arthritis. Moreover, the *D. ruyschiana* herb has antimicrobial, anti-inflammatory, antioxidant and cytotoxic activities. Its medicinal properties come from presence of active constituents, such as: flavonoids and their glucoside derivatives, phenolic acids, anthocyanins and essential oil.

The plant in vitro propagation creates perspectives of obtaining a rare plant material and bioactive compounds for use in agriculture and pharmaceutical industry.

**Aim of the study:** The aim of current research was optimization of medium composition for propagation shoot and next scale up of transformed shoot culture.

**Material and methods:** For optimization of growth, the transformed shoots were cultured on agar (0.7%) Murashige and Skoog medium with auxin 0.2 mg/l IAA and cytokinins: BAP or m-Toplin in concentrations: 0.2, 0.5, 1.0 and 2.0 mg/l. The culture growth period was four weeks. For scale up of culture, the transformed shoots were cultured in two types temporary immersion bioreactors: Rita and Plantform. Bioreactors contained 250 ml (Rita) and 500 ml (Plantform) liquid MS medium with 0.2 mg/l BAP and 0.2 mg/l IAA. In both bioreactor the medium was supplied to culture in period time 10 min every 80 min. The shoots in bioreactors were cultured three weeks. All culture were kept at 26±2°C under a 16h photoperiod. After the growth period the number shoots per explant, number shoots in bioreactor, length of shoots, as well as their FW and DW (g/tubes and g/bioreactor) were determination. We also recorded morphology of shoots.

**Results:** The average shoot length was the greatest for media with 0.2 mg/l BAP (3.1cm) and 0.2 mg/l m-Topolin (2.6 cm). The highest number shoots per explant (2.7) were observed for shoots grown on medium with 0.2 mg/l BAP and IAA 0.2 mg/l. The fresh and dry biomass of shoots was 0.12 mg/tube and 0.01 mg/tube.

In tested bioreactors the transformed shoots of *D. ruyschiana* showed intensively growth after three weeks. The highest number shoots per bioreactor (154) and the highest biomass were observed in Plantform, 23.27 g/bioreactor for fresh and 2.6 g/bioreactor for dry weight. The multiplication rate also was significantly higher (31) for Rita and (19) for Plantform compared to solid medium culture (2.72).

**Conclusions:** The most favorable system for the development of *D. ruyschiana* shoot culture was Plantform bioreactor containing MS medium supplemented BAP 0.2 mg/l i IAA mg/l. The scale-up of *D. ruyschiana* shoot culture allow significant amounts of rare, pharmacologically important plant material.

## Determining the effect of sterols and polyunsaturated fatty acids on the magnitude of dipole potential with a novel high-throughput flow cytometric method

Máté Szabó

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**Tutor:** MD PhD Florina Zákány, PhD Tamás Kovács

**Introduction:** Dipole potential (DP) is an intramembrane potential with a magnitude of around 300 mV, which greatly affects the function and conformation of transmembrane proteins. The magnitude of the DP is mainly determined by the lipid composition and particularly the sterol concentration of the membrane. Thus, diseases characterized by elevated cholesterol or 7-dehydrocholesterol (7DHC) levels, such as hypercholesterolemia (HC) or Smith-Lemli-Opitz syndrome (SLOS), can be associated with elevated DP, which may play a role in their pathophysiology.

**Aim of the study:** In such cases decreasing the DP could be favourable, however, no known physiological method to lower DP has been described. Measurement of the DP, especially in living cells, is difficult, yet we were able to develop a novel flow cytometric method to study the DP in models of such diseases and also in clinical specimens.

**Methods:** We have measured the magnitude of DP in membrane-biophysical models of HC and SLOS with our novel emission ratiometric (Rem) approach using the environment sensitive fluorophore F66 and flow cytometry. The models were created in JY lymphocytoid, THP-1 monocytoid and HEK-293-T human embryonal kidney cell lines treated with methyl-beta-cyclodextrin/sterol complexes. The effects of omega-3 (alpha-linolenic acid), omega-6 (gamma-linolenic acid) fatty acids and stearic acid on DP were determined in disease models using our novel method.

**Results:** In models of HC and SLOS loading the cells with cholesterol and 7DHC resulted in dose-dependent increases in DP ( $\Delta\text{Rem,max}$  -14%, and -8%, respectively). Demonstrating the importance of a diet rich in polyunsaturated fatty acids,  $\omega$ -3 fatty acid decreased, while  $\omega$ -6 or saturated fatty acid increased the magnitude of DP ( $\Delta\text{Rem,max}$  +10%, and -5%, respectively). In combined treatments  $\omega$ -3 fatty acid attenuated, while  $\omega$ -6 fatty acid amplified the effects of cholesterol on DP.

**Conclusion:** The results of our novel flow cytometric method confirmed the positive effect of  $\omega$ -3 fatty acid in reducing the adverse membrane biophysical alterations observed in HC. In our ongoing studies, we are determining alterations in the DP in samples from hypercholesterolemic and hypertriglyceridemic patients compared to control individuals.

**Support:** ÚNKP-20-2-I-DE-416, NTP-NFTÖ-20-B-0115

## Potential novel biomarkers for diagnostics of hormone-related cancer patients - in silico analysis

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**Introduction:** Hormone-related cancers affect numerous individuals worldwide, often leading to death. Because of recent advances in understanding their molecular basis, there is an observable decreasing trend in the number of reported deaths from these cancers. The advances are, among others, achieved by discovering potential early detection biomarkers, as well as molecular targets for novel therapeutics. Thus, it is valuable to undertake further research focusing on identifying these characteristics.

**Aim of the study :**The aim of our study was to investigate gene expression patterns from several signaling pathways in hormone-related cancer patients to distinguish potentially significant biomarkers for clinical purposes via in silico analyses.

**Materials and Methods:** Seven cancer types (BRCA, CESC, OV, PRAD, TGCT, UCEC, UCS) were selected for the study, of which data was further obtained from The Cancer Genome Atlas database. Subsequently, the data was prepared for gene expression analysis by the means of Monocle3 R-package toolkit. During this step, in order to evaluate noticeable similarities and differences in expression, the most significant genes were combined into modules and compared. Lastly, gene ontology evaluation via Protein ANalysis THrough Evolutionary Relationships (PANTHER) was performed to provide functional annotation of selected genes.

**Results:** Monocle3 analysis efficiently segregated cancer types into several molecular groups, distinguishing each malignancy. Interestingly, TGCT cancer appeared to divide into three different subgroups. On the other hand, CESC and UCEC tumors exhibited molecular similarities between each other. In addition, heatmap analysis revealed four gene modules with significantly altered expression between particular cancer types. Ontology evaluation indicated that these genes are mostly associated with carcinogenesis-correlated processes, e.g. angiogenesis, regulation of mitotic cycle or cell communication.

**Conclusions:** To summarize, our preliminary in silico analyses indicate several differences in gene expression patterns in hormone-related cancer patients. Further research focusing on the most significant genes may contribute to advances in diagnostics of these cancers, which is crucial for patient's survival and prognosis.



## **Development of a new test for determination of cells proliferation activity using CFSE pigment**

Bartosz Nowak

1Student Scientific Club of Clinical Immunology, Faculty of Medicine, Poznan University of Medical Sciences

**Presenting author:** Bartosz Nowak

**Tutor:** Prof. Mariusz Kaczmarek

**Introduction:** CFSE (Carboxyfluorescein succinimidyl ester ) is a pigment used for evaluation of proliferative activity of lymphocytes and cancer cells with flow cytometry. Pigment is metabolized within cells and thanks to its succinimidyl groups, the fluorescent conjugates with proteins are being made. Through next cell divisions, the level of CFSE is decreasing proportionally. CFSE pigment could be found with flow cytometry analysis for several days. Importantly, the pigment itself is thought to be safe for cells. Thanks to its unique chemical and physical features, the CFSE is considered to be an ideal candidate for development of new proliferation test.

**Aim of the study:** The aim of the study was to find whether CFSE pigment could be used for proliferation activity test on three different cell lines and try to standardize such a test.

**Material and methods:** Three cell lines: A549 (lung cancer), SKOV-3 (ovarian cancer) and PSN- 1 (pancreatic cancer) were cultured until reaching full confluence. Then the cells from each line were incubated with 2,5 ul of CFSE pigment using protocol provided by the pigment manufacturer. The cells were then cultured until reaching time of 0h, 24h , 48h, 72h and 96h. Additionally the cells from each line with no addition of CFSE were also cultured until reaching corresponding time. Then the cells were collected and analyzed with flow cytometry and specialized software for cells division counting.

**Results:** We found that addition of CFSE pigment corresponded to higher number of death cells, which varies across used cell lines. After 72 h, the percent of death cells incubated with CFSE or not were similar. We also confirmed that the optimal concentration of pigment should be less than 2,5 ul and not more. Interestingly, the proliferation index corresponded to number of cells division made by different lines. The number of cell division varied across examined cell cultures with higher number for A549 culture (5 to 7 division after 72 h incubation) and lower for SKOV-3 and PSN-1 cultures (1 to 4 division in 72 h after CFSE incubation).

**Conclusions:** The CFSE pigment could be potentially dangerous to cells survivability, especially during first hours after incubation with pigment. Each cell line, which would be potentially used for proliferation test should be tested and standardized to corresponding cell line without CFSE before proper experiment. Lung cancer line A549 has biggest proliferation potency, thus it could be used for different functional in vitro tests.

**Acknowledgment:** Project was implemented with the use of funds for science, awarded by the Poznań University of Medical Sciences.

## **Changes in Blood Urea Nitrogen Levels After Performing Islamic Fasting Models in High-Fat-High-Fructose-Induced Rats**

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**Presenting author:** Naufal Arif Ismail

**Tutor:** MD Miranti Dewi Pramaningtyas

**Aim of the study:** High-Fat-High-Fructose (HFHF) intake contributes to developing chronic diseases, including chronic kidney disease (CKD). Fasting in Islam, such as Ramadan fasting (RF), Dawood fasting (DF), and Monday-Thursday fasting (MTF), which is intermittent fasting, have been considered as alternatives to improve health. This study investigates the effect of fasting in Islam on blood urea nitrogen (BUN) changes in HFHF-induced rats.

**Method:** A total of 25 8-week-old male Wistar rats were randomly divided into 5 groups. i) NC, standard diet control; ii) HFHF control diet; iii) RF, fasted every day; iv), DF, on the 1st day of fasting (no food and drink), the 2nd day is free to eat and drink, and the 3rd day is fasted again and repeated so on; v) MTF, fasted only on Mondays and Thursdays. The treatment group fasted after 14 days of HFHF induced, with a fasting duration of 14 hours (17:00 to 07:00), for 29 days. BUN measurement is performed after HFHF induction (pre-test) and after fasting treatment (post-test) using the enzymatic photometric method by Photometer Microlab 300. The data was analysed using paired-samples T-test and Wilcoxon.

**Results:** After fasting treatment, compared to pre-tests, BUN levels did not decrease significantly in the RF group ( $p=0.067$ ) but decreased significantly in the DF ( $p=0.010$ ) and MTF ( $p=0.008$ ) groups. Meanwhile, the NC and HFHF groups did not show any changes in BUN levels.

**Conclusions:** This result suggests this is a new insight into fasting in Islam, DF and MTF can be an alternative in preventing CKD disease caused by HFHF.

## **Metabotropic receptors control of rebound depolarization in medial prefrontal cortex pyramidal neurons**

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**Presenting author:** Piotr Lach

**Tutor:** MD PhD Przemysław Kurowski

**Introduction:** Rebound depolarization (RD) occurs in medial prefrontal cortex pyramidal neurons (mPFC) and leads to a persistent neuronal activity. It is responsible for the conversion of an inhibitory signal into an excitatory signal. In contrast to a physiological excitation, RD lasts hundreds of milliseconds. Prolonged depolarizations are involved in working memory and are implicated in disorders like epilepsy and Alzheimer's disease. A molecular basis of rebound depolarization remains unknown.

**Aim of the study:** The study aimed to evaluate the influence of metabotropic receptors activation in RD generation. Adrenergic, muscarinic, and serotonergic receptors have been tested.

**Material and Methods:** Experiments were performed on layer V mPFC pyramidal neurons in slices obtained from adult male rats (60-day-old rats). Recordings of membrane potential were performed in a whole-cell current-clamp configuration in the presence of tetrodotoxin (TTX), glutamatergic and GABAergic blockers in extracellular solution. Therefore, the tested neurons were synaptically isolated.

**Results:** The resting membrane potential in the tested neurons was  $-67.9 \pm 0.95$  mV. RD exhibited the following properties: evoked after prior cell hyperpolarization below  $-80$  mV, had a threshold close to the resting membrane potential, an amplitude of  $30.6 \pm 1.2$  mV. Adrenergic receptors stimulation by noradrenaline (NA,  $50 \mu\text{M}$ ,  $n=6$ ) and cirazoline ( $\alpha_1$ -adrenoceptor and imidazole agonist,  $100 \mu\text{M}$ ,  $n=7$ ) evoked RD. In 2 of 7 tested pyramidal neurons, application of carbachol (non-selective cholinergic agonist,  $100 \mu\text{M}$ ) elicited RD. Neither isoproterenol ( $\beta$ -adrenoceptor agonist,  $100 \mu\text{M}$ ,  $n=5$ ), clonidine ( $\alpha_2$ -adrenoceptor agonist,  $100 \mu\text{M}$ ,  $n=5$ ), nor serotonin (5-HT receptors agonist,  $50 \mu\text{M}$ ,  $n=3$ ) significantly changed the membrane potential level when applied to the extracellular solution alone.

**Conclusions:** The obtained results suggest that RD in layer V mPFC pyramidal neurons is evoked by the activation of adrenergic and partially cholinergic receptors.

The study was supported by the National Science Centre, Poland (grant number: 2015/17/N/NZ4/02889) and the Medical University of Warsaw (grant number: FW3/2/F/MG/N/20).

## **Growth features of the tibia after repeated fracture in animals with type 2 diabetes**

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St. Luke Lugansk State Medical University», Ukraine

**Presenting author:** Nadezhda Mosyagina

**Tutor:** Prof. V. Luzin

**Introduction:** Osteoporotic bone fractures occurring in patients with type 2 diabetes constitute a major problem for many clinical specialists of both surgical and therapeutical profiles. Repeated fractures even after complete cure of the preceding fracture exert extremely negative effects on other skeletal bones.

**Aim of our study** thus is to investigate growth features of the tibia after fracture following completely healed femur fracture in animals with type 2 diabetes.

**Material and methods:** 84 female rats were distributed into the following groups: group 1 comprised intact animals, group 2 comprised animals with repeated fracture modeled. Fracture modeling was performed in two steps: first fracture was applied to the distal part of the femoral shaft and after 60-day healing course the second fracture was applied to the proximal part of the tibial shaft. Both fractures were performed as simple 2 mm wide round openings in the respective area. Animals of group 3 were on 30-day adipogenic diet resulting in stable hyperglycemia and obesity before fracture modeling was performed. Observation terms constituted 7, 15, 30, and 60 days after formation of the second fracture. Animals were withdrawn from the experiment with the respect to observation terms and tibia were excised and prepared for gross measurements.

**Results:** In animals of group 2 tibia exhibited minute longitudinal growth acceleration by the 7th day while in the rest of the terms growth rate was lower than that of the group 1. In animals of group 3 both longitudinal and appositional growth rates exhibited marked lag in comparison with group 2. Length of the tibia decreased in all observation terms by 1.8%, 1.4%, 1.5%. and 3.4%. Width of the tibial shaft decrease was observed by the 7th, the 15th, and the 60th day – by 2.3%, 9.4%, and 6.2% respectively. Unlike those of group 2 these values show no signs of growth rate restoration. This may be attributed to combined adverse effects of diabetes and repeated fracture.

**Conclusion:** Fracture of the tibia after complete healing of fracture of the femur in animals with type 2 diabetes results in marked inhibition of growth rate of the tibia. Restoration of growth rate even after fracture healing is not observed.

## **Vitamin D increases the expression of antioxidant enzymes in human pancreatic cancer cells exposed to oxidative stress**

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**Tutor:** Prof. Agnieszka Śliwińska

**Introduction:** It has been shown that pancreatic beta cells are particularly exposed to oxidative stress because they have a reduced antioxidant capacity. Recent clinical studies suggest that vitamin D may protect against tumor development. One of the proposed mechanisms involves the regulation of antioxidant enzymes expression. However, this indirect antioxidant action of vitamin D in pancreatic cells is still unknown.

**Aim of the study:** The aim of the study was to determine the effect of vitamin D on the expression of enzymes responsible for protection against oxidative stress induced by hydrogen peroxide in pancreatic cancer cells (PCC).

**Material and methods:** The study was conducted on pancreatic cancer cells 1.2B4, a hybrid cell line that was generated by electrofusion of primary human pancreatic islets cultures with human pancreatic carcinoma cells [HuP-T3]. 1.2B4 cells were incubated with 750 $\mu$ M H<sub>2</sub>O<sub>2</sub> and 100nM vitamin alone and in combination for 24, 48 and 72 hours. Cell viability was determined by the MTT test. The expression level of antioxidant enzymes: catalase (CAT), superoxide dismutase isoenzyme SOD1, SOD2 and SOD3, as well as glutathione peroxidase Gpx1 and Gpx3 were assessed by qRT-PCR and TaqMan probes.

The expression level of the studied genes was determined the  $\Delta\Delta$ -Ct method normalized to the GAPDH reference gene. Student's t test was used to evaluate statistical significance between samples obtained from the MTT assay and qRT-PCR. P<0.05 was considered as statistically significant.

**Results:** Vitamin D (5nM–100nM D) did not decreased viability of PCC. Hydrogen peroxide (50 $\mu$ M–1500 $\mu$ M) decreased in a dose dependent manner the viability of 1.2B4 cells. Based on MTT results for further analysis we choose 100nM D and 750 $\mu$ M H<sub>2</sub>O<sub>2</sub> which caused 20% decrease in cell viability. Vitamin D was found to protect PCC against H<sub>2</sub>O<sub>2</sub>-induced decline in viability. Vitamin D alone did not have any significant effect on the expression level of genes encoding antioxidant enzymes. A similar effect was observed when the cells were exposed to H<sub>2</sub>O<sub>2</sub>. The combine treatment with 100nM D and H<sub>2</sub>O<sub>2</sub> evoked significant increase of CAT expression (p<0.05), SOD1 (p<0.05) and Gpx3 (p<0.05) after 24 hours of incubation. The results also showed an increase in SOD3 expression (p<0.05) after 48 hours. Moreover, an increase in Gpx3 expression (p<0.05) was also found after 72 hours. We did not observe any significant effect of vitamin D and H<sub>2</sub>O<sub>2</sub> on the SOD2 and Gpx1 expression in studied incubation periods.

**Conclusions:** The obtained results suggest that vitamin D protects against oxidative stress induced PCC death and it can be at least partially the effect of upregulation of antioxidant enzymes CAT, SOD1, SOD3 and Gpx3. Therefore, vitamin D may increase antioxidant defense system in response to oxidative stress inducer in PCC. The study was supported by the grant from Medical University of Lodz no. 503/1-159-01/503-21-001-19-00"

## Effect of vitamin D3 on the expression of enzymes modifying the structure of chromatin in 1.2B4 cells

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**Introduction:** Vitamin D3 is a steroid hormone involved in the functioning of the skeletal, neuromuscular, immune, and cardiovascular systems. Vitamin D also suggests to have antioxidant and anti-cancer properties. The mechanism of vitamin D3 action involves the control of gene expression mediated by the VDR / RXR complex and an effect on proteins and secondary messengers of various signaling pathways. Due to the fact that the degree of chromatin packing determines the availability of transcription factors, and thus regulates gene expression, an interesting research problem is the assessment of the effect of vitamin D3 on the expression level of enzymes responsible for the maintenance of DNA methylation and histone acetylation. DNA hipermethylation resulting in chromatin condensation silences gene expression, while histone acetylation causes chromatin relaxation and activation of transcription, DNA repair and telomere silencing. The degree of DNA methylation is kept by DNMT proteins: (cytosine-5) -DNA methyltransferase 1 (DNMT1), (cytosine-5) - DNA 3A methyltransferase (DNMT3A), (cytosine-5) DNA-methyltransferase 3B (DNMT3B) and TET (ten-eleven translocation) proteins: TET1, TET2, TET3. The degree of acetylation is determined by histone acetyltransferases (HATs): KAT2B, CREBBP and EP300 and histone deacetylases (HDAC), including SIRT1.

**Aim of the study:** Determination of the effect of vitamin D3 on the expression level of DNMT1, DNMT3A, DNMT3B, TET1, TET2, TET3, SIRT1, KAT2B, CREBBP, EP300.

**Material and methods:** 1.2B4 cells were incubated with 100 nM 1 $\alpha$ , 25-dihydroxyvitamin D3 for 24, 48 and 72 hours. Expression of DNMT1, DNMT3A, DNMT3B, TET1, TET2, TET3, SIRT1, KAT2B, CREBBP, EP300 was assessed using qRT-PCR Taqman probes. GAPDH was used as a reference gene. Statistical analysis was performed with the student's t test, p <0.05 was considered statistically significant.

**Results:** In the case of DNA methyltransferases and TETs, after 24 hours of incubation with vitamin D3 we observed a significant increase in the expression of TET3 and a decrease of DNMT3A. In turn, upregulation of DNMT3A, TET2 and downregulation of DNMT1, DNMT3B were detected after 48 hours of incubation. Interestingly, after 72 hours of exposure to vitamin D increase in expression of DNMT3A, DNMT3B, TET1, TET2 were noted.

Consistently, HATs and HDACs, a significant increase of KAT2B and a decrease of EP300 were detected after 24 hours of incubation with vitamin D3. On the other hand, after 48 hours we observed only downregulation of KAT2B, CREBBP and EP300. Unexpectedly, after 72 hours of incubation the increase in expression SIRT-1, KAT2B, CREBBP were noted.

**Conclusions:** The obtained results suggest that vitamin D3 may regulate expression of enzymes responsible for epigenetic modifications such as DNA methylation and histone acetylation in human pancreatic cancer cells.

The research was financed by the resources of UMED No. 503/1-159-01/503-21-001-19-00.

## The role of 2'-5'-oligoadenylate synthetase 1 (OAS1) in the limitation of the infection of human microvascular pulmonary endothelium by human rhinovirus

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**Introduction:** Human rhinovirus (HRV) causes infections of upper and lower airways. In patients with asthma, HRV is responsible for heavy and difficult to treat asthma exacerbations often negatively influencing further course of the disease. Recently, it has been proved that, apart from airway epithelium, HRV16 may infect the lung vascular endothelium and induce a very strong antiviral and inflammatory response. However, immediately after infection of endothelium, viral load increases to 5 hours before dropping sharply to finally reach very low levels by 24-72 hours. Such dynamics of HRV16 numbers in the vascular endothelium, different to the human airway epithelium, suggests that upon the infection, certain intracellular mechanisms might be activated to limit the virus load (e.g. based on 2'-5'-oligoadenylate synthetase 1 (OAS1) activity)

**Aim of the study:** The aim of the study was to analyze the potential role of OAS1 in the limitation of viral load in the lung vascular endothelium infected with HRV16.

**Material and methods:** Human pulmonary vascular endothelial cells (HMVECs) were incubated with HRV16 (MOI 3) for 3 hours. Afterwards the rhinovirus was washed out and the cells further cultured for subsequent 5, 24, 48 and 72 hours. mRNA expression of OAS1 was assessed in the real-time PCR and compared between infected culture and uninfected control (mock). OAS1 protein expression was subsequently analyzed in flow cytometry and in the confocal microscope. HRV16 copy numbers and expression of IFN-beta were assessed using real-time PCR and ELISA.

**Results:** HRV16 caused 65-, 66- 47-, and 51-fold increase of OAS1 gene in 5-, 24-, 48- and 72-hour, respectively, as compared to uninfected controls ( $p < 0.05$ ). The viral copy number was 14400, 5300 4900, 1165 in the hours mentioned previously. OAS1 enzyme may be activated in an autocrine manner by the interferon- $\beta$ , that showed 59-fold increase in 5-hour compared to uninfected controls. Enhancement of OAS1 gene expression was accompanied by the 2.4-fold and 2.9-fold increase of OAS1 protein expression in 24 and 72 hours, ( $p < 0.01$ ) assessed in the flow cytometer. HRV16 also caused an increase of OAS1 protein expression assessed in the confocal microscope in 24 hour as compared to uninfected cell culture (Fluorescence Intensity:  $17.3 \pm 9.2$  versus  $5.8 \pm 1.1$ , ( $p < 0.05$ )).

**Conclusions:** The limitation of HRV16 infection observed in the lung vascular endothelium may be associated with the increase of OAS1 and subsequent activation of OAS1-dependant antiviral intracellular mechanisms. This study was funded by STN grant program "Granty UMEDu" 564/1-000-00/564-20-041.

## The role of protein kinase R in the limitation of infections of human microvascular pulmonary endothelium by rhinovirus HRV16

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**Tutor:** Prof. Maciej Chałubiński

**Introduction:** Human rhinovirus (HRV16) is a part of the Picornaviridae family. This pathogen is associated with treatment-resistant exacerbations of asthma during cold seasons. The majority of experiments have concerned rhinoviral infections of the pulmonary epithelium and alveoli. Recent scientific reports have shown that vascular endothelium in the lungs also might be infected and damaged by HRV16. This virus may also induce an antiviral response accompanied by the intracellular limitation of viral particles.

**Aim of the study:** The aim of this study was to analyze if PKR might be associated with the limitation of viral replication of HRV16 within pulmonary endothelium cells.

**Materials and methods:** Human pulmonary microvascular endothelial cells (HMVECs) were incubated with the HRV16 viral suspension (MOI 3 concentration) for 3 hours. The viral suspension was washed out after incubation and the cells were cultured for subsequent 5, 24, 48, and 72 hours. mRNA was reversely transcribed to cDNA, assessed in real-time PCR, and compared among infected cultures and uninfected ones. Translation to PKR protein was subsequently analyzed in flow cytometry. The HRV16 copy numbers and expression of IFN- $\beta$  were assessed using ELISA and real-time PCR.

**Results:** HRV16 caused 4,97-, 7,5-, 6,4- and 3,85-fold increase of PKR gene transcription in 5, 24, 48 and 72 hours respectively, as compared to uninfected controls ( $p < 0,05$ ). After recalculation from MFI to percent values there is a statistical significance in PKR protein synthesis after 24 hours from the infection ( $p = 0,0002$ ; 112,9% - 111% - 109,5% - 129,7% - 100,9% - 101,1% - 149,6% - 156,7%). We have also checked how interferon-beta (IFN- $\beta$ ) levels change after the infection. There is a statistical difference in the production of IFN- $\beta$  transcript after 3-hour incubation and 5-hour culturing after washing out the virus ( $p = 0,0286$ ; 117,6 - 6,07 - 54 - 2,2)

**Conclusions:** The limitation of HRV16 infection in the lung vascular endothelium may be associated with the activity of the PKR enzyme.

These studies are a part of the STN grant program „Granty UMED-u 2020” (564/1-000-00/564-20-041).



## **Pathological changes in the mucous membrane of the small intestine due to prolonged consumption of palm oil**

Rhea Singh

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**Presenting author:** Rhea Singh

**Tutor:** MD Galina Gubina-Vakulyck

**Introduction:** Although palm oil is a very widely consumed commodity, health concerns have risen regarding its safety in the past few decades, due to its high saturated palmitic acid content.

**Aim** of this experimental study was to evaluate the effect of prolonged palm oil consumption on the morphology and function of small intestine (SI) as well as features of proliferation in these cells.

**Methods and materials:** Ten WAG male rats, separated randomly into two equal groups were given 10g/kg of sunflower oil (control group) and palm oil (main group) respectively in their food rations for 5 months. Microscopic investigation and morphometric studies were done on small intestine cells after staining with Periodic Acid Schiff and Einarson's (Gallocyanin-chromalum) stain. Quantitative enterocyte Ki-67 expression was assessed immunohistochemically. Lipid profile and serum level of proteins were evaluated to assess the degree of dysfunction of the small intestine.

**Results:** Significant amount of dysfunction and intense destructive enteritis of mucous membrane was revealed in SI of the rats orally exposed to palm oil. Moreover, Ki-67 expression was decreased in the group of palm oil rats despite significant damage. The biochemical analysis showed decrease in the serum levels of total proteins and phospholipids possibly due to damage to the SI epitheliocytes, which led to their decreased absorptive function. Increase in the levels of total lipids and triglycerides was found due to high level of saturated fatty acid content of the palm oil. Conclusion: Prolonged palm oil consumption promotes destruction and loss of function of the enterocytes with decreased regenerative capability of the epithelium.

## **BASIC SCIENCE 2**

**COORDINATORS:** Marta Ditmer, Jędrzej Chrzanowski

### **Jury**

MD PhD. Agata Gabryelska

Prof. Wojciech Fendler

## **Oviductal telocytes in patients with uterine fibroids.**

Anna Gil

Jagiellonian University Medical College

**Presenting author:** Anna Gil

**Tutor:** MD PhD Veronika Aleksandrovysh, MD Anna Wrona

**Aim of the study:** Tubal factor infertility occurs in 30-35% of infertile pairs. Infertility may be caused by impaired muscular contractility and ciliary beating as well as immunological imbalance and chronic inflammation. Newly discovered telocytes (TCs) have a wide variety of features that play an own role in oviduct physiology. They are engaged in local innervation, sensitivity to hypoxia, and sex steroid hormone balance. Women affected by uterine fibroids often cope with infertility, which is not necessarily the only myoma-related issue. The current study aimed to provide new insight on the involvement of tubal telocytes in the development of infertility through a direct and indirect impact on muscular contractility and ciliary motility in the human oviduct.

**Methods:** The study group consisted of eight patients with uterine fibroids (mean age  $52.9 \pm 6.7$  years), while the control group involved nine patients without uterine fibroids (mean age  $61.6 \pm 8.4$  years). Tissue samples were obtained from the ampullar part of both oviducts (left and right) and then were formalin-fixed, paraffin processed, cut, and stained by immunofluorescence methods for c-kit, tryptase, CD34, PDGFR alpha, CD31, estrogen and progesterone receptors, and iNOS for specific cell type visualization, including telocytes and nitrergic neurons. Routine histology was performed to analyze tissue morphology. The specimens were analyzed using light and fluorescence microscopy and image analysis.

**Results:** Telocytes were detected in the oviduct in both groups. In patients with fibroids, the decreased density of oviductal telocytes was observed. Immunopositivity for sex steroid hormone receptors and local interplay with iNOS-positive nerves were observed for oviductal telocytes in both groups.

**Conclusions:** Our results suggest that oviductal telocytes are crucial for muscular contraction and ciliary motility, which are crucial for fertility.

## **Distinct mesenchymal stem cell-mediated immunosuppressive mechanisms in experimental models of eosinophilic and neutrophilic asthma**

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**Presenting author:** Adrian Janucik

**Tutor:** Prof. Andrzej Eljaszewicz, MSc Marlena Tynecka, Prof. Marcin Moniuszko

**Introduction:** Asthma is recognized as one of the most common civilization diseases worldwide. Unfortunately, despite available therapeutic strategies, around 1% of patients develop severe disease and do not respond to the treatment. Thus, there is a crucial need for the development of novel treatment options. Over 30 years ago, mesenchymal stem cells (MSCs) were proposed to treat lung inflammation, including asthma. However, to date, the mechanisms of beneficial effects of MSC-administration remain not fully elucidated.

**Aim of the study:** Therefore, we aimed here to analyze the MSC-induced changes in the transcriptomic profiles of lungs with eosinophilic and neutrophilic experimental asthma.

**Methods:** Eosinophilic or neutrophilic asthma was induced with 10 µg/mL or 100 µg/mL of house dust mice extract, respectively. Adipose tissue-derived MSCs were administered intranasally. Lung inflammation and remodeling were assessed by HE and Masson's trichrome staining, respectively. RNA isolated from lung tissue was subjected to Next-Generation Sequencing (NGS) on the Illumina platform. "R" software (R Core Team) was used for the differential gene expression analysis. Moreover, Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) enrichment were performed. Gene signatures in canonical and non-canonical signaling pathways were analyzed with Ingenuity Pathway Analysis (IPA; QIAGEN).

**Results:** As expected, our study showed that MSCs significantly limit the lung tissue inflammation in used asthma models. Moreover, MSCs significantly decreased collagen remodeling in neutrophilic asthma. Transcriptomic profiling revealed distinct gene profiles among analyzed phenotypes. In eosinophilic, 438 genes were evaluated as differentially expressed, while in neutrophilic asthma model 2201 were assessed. GO, and KEGG terms in the eosinophilic model included: sensory perception of chemical stimulus and smell, leukemia inhibitory factor and amino acid responses, olfactory transduction, and MicroRNAs in cancer. In neutrophilic asthma, we found: Wnt signaling, MAPK/ERK pathway, and many functional processes. Moreover, IPA analyses indicated inhibition of the inflammatory responses with down-regulated pathways such as Crosstalk between Dendritic Cells and Natural Killer Cells, Dendritic Cell Maturation, and B Cell Receptor Signaling in eosinophilic and Leukotriene Biosynthesis in a neutrophilic asthma model.

**Conclusions:** In summary, we showed that MSC-administration in novel eosinophilic and neutrophilic asthma models effectively reduces inflammation. Moreover, we showed the limitation of lung remodeling in neutrophilic asthma after MSC-administration. More importantly, we found differently regulated gene signatures and pathways, indicating distinct putative mechanisms of immunosuppressive effects exerted by intranasal MSC-administration. A better understanding of these effects may allow the development of novel therapeutic strategies in eosinophilic and neutrophilic asthma.

## **Evaluation of vitamin D3 and methylprednisolone effects on podocytes viability in the minimal changes disease in vitro model.**

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**Presenting author:** Zuzanna Parfienowicz

**Tutor:** MD PhD Kamil Grubczak, MD PhD Kamil Grubczak

**Introduction:** Minimal change disease (MCD) is the most common idiopathic nephrotic syndrome in children and is characterized by proteinuria and loss of podocyte ultrastructure. The MCD-related phenomenon is not fully understood, however, it is directly associated with nephrotic syndrome development. Most recent studies are focused on immunological aspects related to structural changes observed in podocytes, leading eventually to loss of integrity of the glomerular membrane and subsequent proteinuria. In addition, to date, there are no data on immunomodulators in the MCD, including steroids and vitamin D3.

**Aim of the study:** Our study was aimed at flow cytometric evaluation of changes in podocytes apoptosis and viability in response to steroids and vitamin D3 application in the minimal change disease (MCD) in vitro model.

**Method:** The podocyte cell line (CIHP-1; University of Bristol) was incubated with LPS+PAN to induce selective cell damage to reflect the morphology of podocytes observed in MCD. Furthermore, cells were treated with different concentrations of vitamin D3 (VIT.D3) and methylprednisolone (MP). The viability and percentage of apoptotic cells were established using flow cytometric analysis.

**Results:** We found that the application of vitamin D3 or steroids did not result in cytotoxic effects on podocytes. In contrary, we found that low 40ug/ml concentration of steroids or high 100nM dose of vitamin caused a reduction in the number of early apoptotic cells. Notably, initial induction of MCD in vitro model led to significant changes on annexin binding by podocytes, possibly resulting from disturbed membrane properties.

**Conclusions:** In conclusion, the application of steroids or vitamin D3 does not impact podocytes viability in the MCD in vitro model. Moreover, the improvement in survival of podocytes can be observed after applying selected concentrations of studied immunomodulators. Subsequent experiments are of great importance for an in-depth mechanistic evaluation of vitamin D3 and steroid effects on podocytes function and survival in the course of minimal change disease.

## **Occurrence of ermF and cfxA genes in Bacteroides non-fragilis and Parabacteroides spp. isolated from diarrheal stool samples.**

Emilia Platos

Student's Scientific Group at Chair and Department of Medical Microbiology, Medical University of Warsaw

**Presenting author:** Emilia Platos

**Tutor:** PhD Kornelia Jasinska, PhD Marta Kierzkowska

**Introduction:** Occurrence of antibiotic resistance genes (ARGs): ermF and cfxA correlates with antibiotic resistance to clindamycin (MLS phenotype) and beta-lactams (penicillin, cephalosporin and ceftiofur) respectively. Bacteroides and Parabacteroides are a part of natural microbiome of gastrointestinal tract. Antimicrobial resistance (AMR) in these groups increased over the last years. Bacteria tend to be more resistant in stool rather than in other specimens.

**Aim of the study:** The prevalence of ermF and cfxA genes in bacteria from Bacteroides non-fragilis and Parabacteroides spp. in stool samples from patients with diarrhea.

**Material and methods:** In our study 155 species from 103 patients suspected of occurrence of antibiotic-associated diarrhea and hospitalized in Clinical Hospital in Warsaw were examined between 08.2019-01.2020. Patients stayed at surgical, transplantology, urological, cardiological, internal medicine, orthopedic, geriatric and dermatological wards. Stool samples were plated onto Bacteroides Bile Esculin Agar (BBE, Becton Dickinson, USA) and were incubated in 37°C in anaerobic conditions for 48 hours. Isolation of colonies was performed on Schaedler Agar and Columbia Agar (oxygen control), (bioMérieux, France). For identification of isolates we used mass spectrometry MALDI-TOF MS of VITEK MS (bioMérieux, France). DNA isolation was performed by Genomic mini kit (A&A Biotechnology). PCR assays were used to detect the presence of resistance genes. Amplification products were analyzed by electrophoresis in agarose gel stained with ethidium bromide.

**Results:** ErmF and cfxA genes were detected in 73 (47%) and 67 (43%) samples respectively, while both were found in 37 (24%) samples. Highest frequency of ermF and cfxA incidence was observed on internal medicine ward.

**Conclusions:** Prevalence of ermF and cfxA in stool strains is significant. High detection rates of the ermF and cfxA genes suggest that these strains act as reservoirs for antibiotic resistance genes. For proper management of antimicrobial resistance development in Bacteroides non-fragilis group of bacteria, it is necessary to determine antimicrobial resistance patterns and closely observe the resistance genes. It is important to monitor occurrence of resistance genes in fecal microbiota transplant, because their transfer to new environments facilitates growth of resistance."

## **Petroclinoid ligament and Dorello's canal anatomic variability and their clinical implications.**

Przemysław Kasiak

Medical University of Warsaw; Faculty of Medicine

**Presenting author:** Przemysław Kasiak

**Tutor:** MD PhD Jacek Kunicki

**Introduction:** The petroclinoid ligament (PCL) creates the roof of the Dorello's canal (DC). Close relationship with various significant anatomic structures, as the abducens nerve and the petroclival venous confluence, plays an important clinical role. From a surgical point of view, proper knowledge of these variations enable using PCL as a landmark in numerous neurosurgical skull base procedures.

**Aim of the study:** Our goal was to assess anatomic variability of the petroclinoid ligament (Gruber's ligament/PCL) and Dorello's canal with emphasis on their further clinical implications.

**Material and methods:** We dissected 94 sides from 47 skull base specimens of adults (mean age- 54,9 years; 36 males; 11 females). The arteries were injected with colored latex to facilitate the dissection. The PCL and DC area were dissected with microsurgical techniques using magnification 2-10X (OPMI PZO/Zeiss). We investigated: shape, structure and attachment points of ligament. Measurements of the PCL, DC and neighboring skull base structures were completed using morphometric software and microscope ocular ruler. Moreover, the angle and inclination of PCL according to the body planes were evaluated.

**Results:** We have observed all previously defined types of PCL, with the butterfly's type being most common (35,11%; n=33). In a few specimens the ligament was duplicated, ossified or hypoplastic. The mean length of the PCL was  $12,9 \pm 2,4$  mm. The PCL origin/insertion were significantly variable- petrous apex and its neighbouring bone to the area between posterior clinoid process and upper clivus. The mean DC width and length were, respectively,  $1,7 \pm 1,2$  mm and  $7,9 \pm 3,5$  mm. PCL relation to the sagittal plane varies between specimens from  $22^{\circ}20'37''$  to  $66^{\circ}48'52''$  (mean-  $43^{\circ}9'54''$ ) and is strongly dependent on location of the attachment points.

**Conclusions:** A petroclinoid ligament and a Dorello's canal are both highly variable structures. Specific anatomical configurations of these structures may influence the different susceptibility of the CN VI (located laterally or medially in DC) to injury during skull base surgical approaches and cranio-cerebral trauma.

## **Anterior Cruciate Ligament Innervation - the key to understand ACL injury and reconstruction.**

Bartosz Gonera, Konrad Kurtys

Medical University of Łódź Anterior Cruciate

**Presenting author:** Bartosz Gonera

**Tutor:** Prof. Łukasz Olewnik

**Introduction:** Seemingly well known innervation of the anterior cruciate ligament may still surprise us. Anatomists claim that ACL receives nerve fibers from the posterior articular branches of the tibial nerve which enter through the posterior aspect of the knee joint capsule. Nerve fibers run along with the vessels surrounding the ligament. However, anatomists are only focused on the part of the nerve that run to the ligament. There is lack of the studies that provide view inside of the ligament. Precise branching and distribution patterns inside of the ligament may be of great use while planning ACL surgery using autologous graft. After ACL injury there are still remnants of the injured ligament and it is crucial to decide what to do with them. Recent studies have revealed statistically better proprioceptive and functional outcomes using remnant preserving technique compared with the standard technique. However, there is no proven indicators which remnants are worth preserving.

**Purpose:** The aim of the study is to examine and reveal nerve distribution inside of the anterior cruciate ligament. In this study we use absolutely brilliant, but largely forgotten Sihler's staining method. Based on the findings it is possible to establish the mean length of the remnants that still have the nerve endings inside, and thus are more likely to contribute to faster graft innervation.

**Material and methods:** The classical dissection of 20 lower limbs, followed by morphological measurements, was performed. Dissection begins with the removal of the skin and superficial fascia from the area of the knee and anterior surface of the thigh, up to the patellar tendon. Following this, the patellar tendon has to be carefully isolated from tibial tuberosity. In order to expose ACL, the patella has to be everted. The next step is to isolate the ACL from both attachments. It is then subjected to the modified Sihler's staining method, according to a strictly specified protocol. This method allows mapping an entire nerve branching inside of the muscle or ligament while other structures become transparent or translucent.

**Results:** Dissection of 20 lower limbs revealed that in every case the main nerve trunk from the posterior articular branch of the tibial nerve inserts into the posterior side of the ACL, closer to its femoral attachment. Insertion point of the nerve is approximately 1,5cm from the proximal attachment of the ACL. Its diameter is approximately 0,5mm and in most cases it branches inside of the ligament. Different types of intraligamental innervations are observed.

**Conclusions:** Innervation inside of the anterior cruciate ligament seems to be variable but in our opinion its proximal part(femoral) is the most important, as in every case the main nerve trunk inserts and branches closer to this attachment. In most cases if the remnant is at least 1,5cm long it should contain nerve endings and it may accelerate the process of ligamentization and improve proprioception if properly fixed to the autograft.



## Assessment of the GTPase activity of 3 RAS proteins: KRAS wild-type, KRAS G12V and KRAS G12D

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Medical University of Lodz

**Presenting author:** Marta Węgierska

**Tutor:** Prof. Piotr Rieske MD, PhD Aneta Włodarczyk MSc

**Introduction:** Mutations of KRAS protein are prevalent among patients with pancreatic, colon and lung malignancies. In case of KRAS gene, observed alterations lead to the constant activation of KRAS protein, which is equal to the decline of its GTPase activity. Mutation in KRAS results in continuous activation of downstream effectors from pathways associated with cell survival and proliferation. KRAS G12V and G12D are one of the most frequently occurring mutations and it is crucial to better understand the impact of these alterations on the KRAS GTPase activity.

**Aim of the study:** The assessment of the GTPase activity of KRAS G12V and G12D in comparison to the KRAS wild-type (WT) protein.

**Materials and methods:** To obtain eukaryotic cell lines expressing KRAS WT, KRAS G12V and G12D proteins, the mutagenesis was performed using Chinese Hamster Ovary (CHO) cell line and plasmid vectors containing desired mutants and His-Tag and FLAG sequences. CHO cells expressing recombinant proteins were cultured in DMEM medium enriched with 10% FBS until they reached almost 90% confluency. Subsequently, cells were lysed and the protein purification assay was performed using HisTrap column. Isolated and purified KRAS WT, G12V and G12D proteins were used to perform GTPase activity assay in triplets.

**Results:** All cells had proven production of KRAS WT, G12V and G12D and the purity of each sample was sufficient. GTPase assay results have shown higher GTPase activity in case of KRAS WT in comparison to KRAS G12V and G12D. Addition of GAP increased the GTPase activity only when added to KRAS WT, while no significant changes in case of KRAS G12V and G12D were observed.

**Conclusions:** GTPase activity of KRAS protein is crucial to maintain proper signals transduction within the cell and switching KRAS activity between "on" and "off" state should be under strict control. Mutations localized in codon 12, such as G12V and G12V impair the GTPase activity of KRAS protein leading to its constant activation independently on the presence of GAPs and therefore continuously promoting downstream pathways associated with cell proliferation and cell survival. These alterations may contribute to the development of cancerous lesions and redound to the cancer cells resistance to currently used therapies. The relationship between the occurrence of KRAS protein mutations among cancer patients and their high mortality rate is alarming and requires further studies leading to the development of new potential therapeutic agents."

## **The assessment of the potentially effective combination of two kinase inhibitors CID2858522 and SU11274 in DK-MG high glioblastoma cells**

Amelia Kierasńska, Marta Węgierska, Damian Ciunowicz  
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**Presenting author:** Amelia Kierasńska

**Tutor:** MSc Adrianna Rutkowska, MD PhD Ewelina Stoczyńska-Fidelus

**Introduction:** Glioblastoma (GB) belongs to the group of the most aggressive brain tumors. The current methods of patient treatment are still not efficient enough, which is associated with a high mortality rate. DK-MG high is a stable glioblastoma cell line and it is characterized by a high expression of the altered epidermal growth factor receptor (EGFR) known as EGFRvIII variant. The occurrence of EGFRvIII in GB ranges between 25-30% and there is still no targeted therapy for this neoantigen. Determination of potential therapeutic drugs and their eventual combination approach is crucial for improvement of currently used treatment methods and the betterment of GB patients' lives. Here we made an attempt to select, based on molecular profile and current published data, and analyse two small molecules separately and in combination. CID2858522 belongs to the group of NF- $\kappa$ B activation inhibitors, while SU11274 is a c-Met inhibitor used in non-small cell lung cancer.

**Aim of the study:** Assessment of the IC<sub>30</sub>, IC<sub>50</sub>, IC<sub>70</sub> and the best combination index of CID2858522 and SU11274 in glioblastoma cells.

**Materials and methods:** To determine each IC value and combination, DK-MG high cells were seeded on the 96-well plate and incubated in RPMI 1640 medium enriched with 10% FBS for 24 hours. Before treatment of DK-MG high cells with analyzed compounds, the medium was exchanged on RPMI 1640 serum free for another 24 hours. The test compounds (including CID2858522, SU11274 as well as Afatinib as a control) were added to the cell culture for 72 hours. An additional control with DMSO as a vehicle was included. The viability of cells was verified using CellTiter 96<sup>®</sup> AQueous One Solution Reagent (Promega). The statistical analysis was conducted in GraphPad Prism 8.0.1 software.

**Results:** Firstly, the IC<sub>30</sub>, IC<sub>50</sub>, and IC<sub>70</sub> values for each of the analyzed compounds were indicated. The obtained IC values were used to assess the best possible combinations of tested compounds. For two combinations, CID2858522 at the constant concentration of 10  $\mu$ M and SU11274 at two different concentrations (9.97  $\mu$ M, and 132.46  $\mu$ M), the combination indexes (CI) were higher than 1. The CI for the rest of tested combinations was lower than 1.

**Conclusions:** The obtained results for the whole analyzed concentrations showed that only for two combinations of CID2858522 and SU11274 the synergistic and promising effect of the combined possible therapeutic agents was obtained. In case of the other tested combinations, the compounds at the analyzed concentrations act antagonistically. These outcomes suggest that usage of both CID2858522 and SU11274 at the particular concentrations may be further analysed to find an effective strategy of therapy for glioblastoma patients.

## Systems biology approach to cell surface proteins of human melanocytes and melanoma cells

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**Tutor:** MD PhD Tibor Hajdú, MD PhD Csaba Matta

**Introduction:** The complement of cell surface proteins is collectively referred to as the surfaceome. The composition of the surfaceome undergoes significant alterations during pathological conditions. Therefore, proteomic analysis of the surfaceome during the development of diseases such as malignant melanoma can provide valuable information for therapy, diagnosis, or prognosis. However, the surfaceome of human pigment cells is currently unexplored.

**Aim of the study:** The aim of our study was to characterize the surfaceome of human cutaneous melanocytes and melanoma cells and to explore signalling pathways related to cell surface proteins. This *in silico* approach may give us a global picture on possible relationships between the identified proteins and networks involved in melanoma evolution.

**Methods:** Three pigment cell cultures were used in our experiments. Epidermal melanocytes were isolated from human skin samples. WM35 melanoma cell line was established from *in situ* melanoma, while A2058 is derived from metastatic melanoma. Cell surface proteins were labelled with aminooxy-biotinylation, followed by mass spectrometry using high throughput shotgun proteomics to define the surfaceome. Gene ontology (GO) annotations of the identified proteins were obtained from the UniProt database.

**Results:** According to the proteomic analysis, 70-84% of the identified proteins were found to be cell surface proteins. A total of 416 (melanocytes), 256 (WM35) and 567 (A2058) surface proteins were discovered in the cell cultures. The combined list comprised 754 different proteins, of which 128 proteins were detected in melanocytes only, whereas 338 proteins were specific to the melanoma cell lines. These proteins could be useful indicators of benign vs. malignant transformations. 164 proteins were identified in all three cell types; this group may comprise proteins with altered expression and/or function in malignant cells. The next step was to further examine the identified surfaceome proteins by the Reactome database. The analysis revealed that signalling pathways present in melanocytes with the highest possibility are not related to surface proteins. In WM35 cells MET, RAP1, MAPK and B-Raf signalling was significantly over-represented amongst the identified pathways. In A2058 cells the Rho-GTP-ase, Slit-Robo and L1CAM signalling cascades were detected to be the most possible pathways in correlation with the surfaceome.

**Conclusion:** Our results identified new molecular targets that may serve as potential biomarkers in melanoma treatment. The novel, systems biology approach enabled a more targeted analysis of the pigment cell surfaceome database. The differences found in the surfaceome and related pathways of healthy vs. malignant pigment cells can lead to the discovery of highly selective biomarkers on disease onset and progression.

**Grants:** Supported by the ÚNKP-20-2 New National Excellence Program of the Ministry for Innovation and Technology from the Source of the National Research, Development and Innovation Fund.

**Analysis Zearalenone (ZEA) and its active metabolites  $\alpha$ -zearalenol and  $\beta$ -zearalenol ( $\alpha$ -ZOL,  $\beta$ -ZOL) reduce the viability of the human lung carcinoma cells**

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**Introduction:** Lung cancer is one of the most common cancers in the world, and the leading cause of cancer death for women and men. Almost 85% of patients with lung cancer are diagnosed with non-small-cell lung cancer (NSCLC), one of the most prevalent types of lung cancer. The etiology of this disease primarily includes environmental factors. Zearalenone (ZEA) is non-steroidal mycotoxin produced by mold fungi belonging to the *Fusarium* family, which show strong estrogenic activity.  $\alpha$ -ZOL and  $\beta$ -ZOL are the main metabolites of zearalenone, formed during the hydroxylation process. Both ZEA and its biologically active metabolites are considered as estrogenic mycotoxins, due to structural similarity to naturally occurring estrogens.

**Aim of the study:** The aim of the study was to evaluate the effect of ZEA,  $\alpha$ -ZOL,  $\beta$ -ZOL on the viability of tumor cells derived from lung tissue (A549 cell line).

**Materials and methods:** Lung cancer cell line A549 was treated with ZEA,  $\alpha$ -ZOL,  $\beta$ -ZOL in the concentration range 100-0.001 $\mu$ M for 24, 48 and 72 hours. The viability of cells was measured with MTT and AlamarBlue assays. One-way ANOVA was used to calculate statistical significance.  $p < 0.05$  was considered as statistically significant (GraphPad Prism software).

**Results:** The results showed that ZEA,  $\alpha$ -ZOL,  $\beta$ -ZOL significantly reduced the viability of the A549 cell line in a time- and dose- dependent manner. The A549 cell line shows the greatest sensitivity to  $\alpha$ -zearalenol, which may be related to its stronger estrogenic activity compared to ZEA and  $\beta$ -ZOL. Additionally, the results suggest that lung cancer cells are more sensitive to higher doses of mycotoxins.

**Conclusion:** The results indicate that estrogenic mycotoxins such as ZEA,  $\alpha$ -ZOL,  $\beta$ -ZOL may affect lung cancer cells due to the presence of estrogen receptors (ER $\alpha$  and ER $\beta$ ) in these cells and thus potentially participate in the process of carcinogenesis. However, this statement needs further studies to be confirmed.

## Effect of vitamin D3 on the expression of enzymes modifying the structure of chromatin in 1.2B4 cells

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**Introduction:** Vitamin D3 is a steroid hormone involved in the functioning of the skeletal, neuromuscular, immune, and cardiovascular systems. Vitamin D also suggests to have antioxidant and anti-cancer properties. The mechanism of vitamin D3 action involves the control of gene expression mediated by the VDR / RXR complex and an effect on proteins and secondary messengers of various signaling pathways. Due to the fact that the degree of chromatin packing determines the availability of transcription factors, and thus regulates gene expression, an interesting research problem is the assessment of the effect of vitamin D3 on the expression level of enzymes responsible for the maintenance of DNA methylation and histone acetylation. DNA hipermethylation resulting in chromatin condensation silences gene expression, while histone acetylation causes chromatin relaxation and activation of transcription, DNA repair and telomere silencing. The degree of DNA methylation is kept by DNMT proteins: (cytosine-5) -DNA methyltransferase 1 (DNMT1), (cytosine-5) -DNA 3A methyltransferase (DNMT3A), (cytosine-5) DNA-methyltransferase 3B (DNMT3B) and TET (ten-eleven translocation) proteins: TET1, TET2, TET3. The degree of acetylation is determined by histone acetyltransferases (HATs): KAT2B, CREBBP and EP300 and histone deacetylases (HDAC), including SIRT1.

**Aim of the study:** Determination of the effect of vitamin D3 on the expression level of DNMT1, DNMT3A, DNMT3B, TET1, TET2, TET3, SIRT1, KAT2B, CREBBP, EP300.

**Material and methods:** 1.2B4 cells were incubated with 100 nM 1 $\alpha$ , 25-dihydroxyvitamin D3 for 24, 48 and 72 hours. Expression of DNMT1, DNMT3A, DNMT3B, TET1, TET2, TET3, SIRT1, KAT2B, CREBBP, EP300 was assessed using qRT-PCR Taqman probes. GAPDH was used as a reference gene. Statistical analysis was performed with the student's t test, p <0.05 was considered statistically significant.

**Results:** In the case of DNA methyltransferases and TETs, after 24 hours of incubation with vitamin D3 we observed a significant increase in the expression of TET3 and a decrease of DNMT3A. In turn, upregulation of DNMT3A, TET2 and downregulation of DNMT1, DNMT3B were detected after 48 hours of incubation. Interestingly, after 72 hours of exposure to vitamin D increase in expression of DNMT3A, DNMT3B, TET1, TET2 were noted.

Consistently, HATs and HDACs, a significant increase of KAT2B and a decrease of EP300 were detected after 24 hours of incubation with vitamin D3. On the other hand, after 48 hours we observed only downregulation of KAT2B, CREBBP and EP300. Unexpectedly, after 72 hours of incubation the increase in expression SIRT-1, KAT2B, CREBBP were noted.

**Conclusions:** The obtained results suggest that vitamin D3 may regulate expression of enzymes responsible for epigenetic modifications such as DNA methylation and histone acetylation in human pancreatic cancer cells.

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## **Zearalenone induces oxidative stress, apoptosis and cell cycle disturbances in ovarian cancer cells**

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**Introduction:** Zearalenone (ZEA) is a fungal mycotoxin produced mainly by *Fusarium* species found in wide range of cereal products such as maize, barley, wheat, rice and etc. ZEA is reported to be a xenoestrogen due to its structural similarity to naturally occurring estrogens.

Ovarian cancer is the seventh cause of death and morbidity in females worldwide due to its late diagnosis and non-specific symptoms, thus the morbidity of it is still growing. Hormonal imbalance and disorders are postulated as one of the risk factors for ovarian cancer development. Therefore, estrogen-like mycotoxin present in diet might affect ovarian cancer cells.

**Aim of the study:** The aim of the study was to evaluate the effect of ZEA on the viability, oxidative stress and cell cycle progression of ovarian cancer cells.

**Materials and methods:** Ovarian cancer cell lines OVCAR3 and SKOV3 were treated with ZEA in the concentration range 100-0.001 $\mu$ M for 24, 48 and 72 hours. The viability of cells was measured with MTT assay. Based on the viability results three doses of ZEA (30 $\mu$ M, 10 $\mu$ M and 1 $\mu$ M) were chosen for the rest of experiments. Oxidative stress was estimated by reactive oxygen species (ROS) concentration using Oxidative Stress Kit (Merck Millipore). Apoptosis was determined using AnnexinV & Dead Cell Kit (Merck Millipore) and cell cycle distribution was examined by Muse Cell Cycle Kit (Merck Millipore). Migration of cells was evaluated with wound-healing assay (ImageJ software). To calculate statistical significance One-way ANOVA was used. P value lower than 0.05 was considered as statistically significant (GraphPad Prism software)

**Results:** The results showed that ZEA significantly decreased viability of both cell lines in a time- and dose-dependent manner. Moreover, an exposure to all doses leads to generation of ROS and induction of apoptosis, but only in the SKOV3 cell line. In the OVCAR3 cell line, only at the highest doses an increased number of ROS-positive was observed while an increased number of apoptotic cells was observed only at the highest dose. Cell cycle disturbances (G2/M cell cycle arrest) and modulation of the migration of cells were observed in both cell lines

**Conclusion:** The results indicate that ZEA is able to induce oxidative stress and apoptosis in ovarian cancer cell lines. However, it might be postulated that SKOV3 cell line is more sensitive to ZEA, what might be associated with different proportion of estrogen receptors in these cell lines, however needs further studies to be confirmed. Nevertheless, the results suggest that present in everyday diet estrogenic mycotoxins might affect ovarian cancer cells and potentially participate in the process of carcinogenesis.

## **Development of a new test for determination of cells proliferation activity using CFSE pigment**

Bartosz Nowak

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**Tutor:** Prof. Mariusz Kaczmarek

**Introduction:** CFSE (Carboxyfluorescein succinimidyl ester ) is a pigment used for evaluation of proliferative activity of lymphocytes and cancer cells with flow cytometry. Pigment is metabolized within cells and thanks to its succinimidyl groups, the fluorescent conjugates with proteins are being made. Through next cell divisions, the level of CFSE is decreasing proportionally. CFSE pigment could be found with flow cytometry analysis for several days. Importantly, the pigment itself is thought to be safe for cells. Thanks to its unique chemical and physical features, the CFSE is considered to be an ideal candidate for development of new proliferation test.

**Aim of the study:** The aim of the study was to find whether CFSE pigment could be used for proliferation activity test on three different cell lines and try to standardize such a test.

**Material and methods:** Three cell lines: A549 (lung cancer), SKOV-3 (ovarian cancer) and PSN- 1 (pancreatic cancer) were cultured until reaching full confluence. Then the cells from each line were incubated with 2,5 ul of CFSE pigment using protocol provided by the pigment manufacturer. The cells were then cultured until reaching time of 0h, 24h , 48h, 72h and 96h. Additionally the cells from each line with no addition of CFSE were also cultured until reaching corresponding time. Then the cells were collected and analyzed with flow cytometry and specialized software for cells division counting.

**Results:** We found that addition of CFSE pigment corresponded to higher number of death cells, which varies across used cell lines. After 72 h, the percent of death cells incubated with CFSE or not were similar. We also confirmed that the optimal concentration of pigment should be less than 2,5 ul and not more. Interestingly, the proliferation index corresponded to number of cells division made by different lines. The number of cell division varied across examined cell cultures with higher number for A549 culture (5 to 7 division after 72 h incubation) and lower for SKOV-3 and PSN-1 cultures (1 to 4 division in 72 h after CFSE incubation).

**Conclusions:** The CFSE pigment could be potentially dangerous to cells survivability, especially during first hours after incubation with pigment. Each cell line, which would be potentially used for proliferation test should be tested and standardized to corresponding cell line without CFSE before proper experiment. Lung cancer line A549 has biggest proliferation potency, thus it could be used for different functional in vitro tests.

**Acknowledgment:** Project was implemented with the use of funds for science, awarded by the Poznań University of Medical Sciences.

## **Morphological variations of extramuscular innervation of the gracilis muscle - guidance for functioning free muscle transplantation.**

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**Presenting author:** Konrad Kurtys

**Tutor:** Prof. Łukasz Olewnik

**Introduction:** The gracilis muscle (GM) is located on the medial side of the thigh and belongs to the adductor muscles group of the hip. The GM is considered as a versatile anatomical structure by the reconstructive surgery society. Dependently on indications, it can be used as a pedicled flap, free microsurgery flap, or even functioning free muscle flap. A free functioning muscle flap can be used for functioning free muscle transplantation to provide functional restoration in a long-term facial palsy or a damaged part of the forearm.

**Purpose:** The aim of our research is to find and describe morphological variations of extramuscular innervation of the GM and create the first classification system which may help clinicians in planning surgical reconstruction using this muscle.

**Material and Methods:** Classical anatomical dissection was performed on 36 detached lower limbs (20 right, and 16 left) fixed in 10 % formalin solution. Skin and subcutaneous tissue on the medial side of the thigh were removed to reach the GM. Then, its origin and insertion were exposed. The obturator nerve with its anterior branch was found on the deep side of the GM afterwards. The course of the anterior branch had to be traced and all its small branches were revealed and cleansed to each entry point. All additional branches, if any, were treated in the same way. Morphological variations were assessed and their prevalence was evaluated.

**Results:** Four different types of extramuscular innervation of the GM were found. They were labelled according to prevalence. Type I (61.11%) is characterized by a single nerve branch dividing into many small branches and a reverse branch innervating the proximal part of the muscle. Most commonly the reverse branch was very small. Type II (25%) is quite similar to type I, but a difference is a lack of the reverse branch. Type III (11.11%) presented one main classic branch and an additional branch coming from the nerve branch innervating the adductor longus muscle. The last type IV (2.78%) seems to be similar to type III, but an additional branch in this case coming from the nerve branch innervating the adductor magnus muscle. The main and additional branches in both types III and IV divided into many small branches before they entered the muscle belly.

**Conclusion:** All of the extramuscular innervation types of the GM are usable for free functioning muscle transplantation. Nevertheless, it seems that two of them, namely type III and IV, allow clinicians to divide one GM into two entirely apart muscle flaps with an appropriate nerve branch for transplantation and could be used as free functioning muscle flaps in different sites of a being reconstructed body. It might not be done with type I and II because of their single nerve branch dividing only into many small branches.



## **CARDIOLOGY**

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**Analysis of select clinical parameters and comorbidities among patients with valvular heart disease hospitalised in the II Department of Cardiology and Cardiovascular Interventions UJ CM**

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**Presenting author:** Zuzanna Sachajko

**Tutor:** Prof. Monika Komar

**Introduction:** Few data exists on select clinical parameters and comorbidities in conjunction with predictors of mortality in patients with valve disease.

**Aim of the study:** Assessment of the incidence of valvular heart disease and valvular interventions with the analysis of select clinical parameters, comorbidities and predicting factors of mortality.

**Material and methods:** We retrospectively analysed medical records of 688 patients with valvular heart disease, that were hospitalised in January through July of 2017. Follow – up was conducted through a phone interview.

**Results:** Patients were primarily male (60,3%) with the median age of 69 years (SD= 12,5). The median age difference between female and male patients was statistically significant (73 y.o. and 68 y.o. respectively,  $p<0,001$ ). The most common valvular defect was aortic stenosis (43,9%), followed by secondary mitral regurgitation (21,9%). The difference in incidence of primary mitral regurgitation was statistically significant between male and female patients (6,8% and 11,1% respectively,  $p<0,042$ ), as well as of aortic regurgitation (6,1% for males and 1,1% for females,  $p<0,02$ ). 21,3% of patients underwent surgical valvular interventions. At follow-up 15,5% of patients died. The highest mortality rate was observed in patients with aortic stenosis (11,3%). Analysis of deaths showed, that independent predictors of mortality were: heart failure after surgical valvular intervention ( $p<0,013$ ), history of hospitalisation caused by heart failure ( $p<0,001$ ), history of myocardial infarction (0,003), chronic renal failure ( $p<0,001$ ), chronic lung disease ( $p<0,012$ ) and NYHA class ( $p<0,001$ ).

**Conclusions:** In our study group the most frequent valve disease was aortic stenosis. Women were significantly older than men. During a 3-year observation period 15,5% of patients died. Independent predictors of mortality were: surgical valvular intervention complicated by heart failure, history of hospitalisation caused by heart failure, history of myocardial infarction, chronic renal failure, chronic lung disease and NYHA class on admission.

## **Cardiovascular characteristics of in-hospital patients with COVID-19: a single centre study.**

Joanna Wojtania

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**Tutors:** MD PhD Łukasz Chrzanowski, Prof. Anna Polańska

**Introduction:** The coronavirus disease 2019 (COVID-19) has been spreading worldwide with more than 130 million infections confirmed so far, and outcomes attributable to over 2 million deaths have been reported. Cardiovascular conditions are well known to affect general health perspective in Europe and in a substantial number of countries outside, however the interconnection with SARS-CoV-2 remains multidimensional and incompletely characterised.

**Aim of the study:** The aim of the study was to assess a cardiovascular profile of COVID-19 patients (pts) admitted to a single Institution Cardiology Department.

**Material and methods:** Consecutive pts hospitalised from October through December, 2020 were included, all with non-critical COVID-19 on admission. The diagnosis at discharge was studied, denoting acute pulmonary embolism, acute coronary syndromes, de-novo form of coronary artery disease, paroxysmal atrial fibrillation, infective endocarditis. Previously diagnosed conditions remained left out of the analysis.

**Results:** 200 pts were assessed, presenting at mean age of 67.4 sd 13 years, 130 (65%) men. Details of specific cardiovascular involvement demonstrated acute pulmonary embolism in 42 pts (21%), acute coronary syndromes in 18 pts (9%), paroxysmal atrial fibrillation in 6 pts (3%), de-novo diagnosis of coronary artery disease in 1 pt (0,5%), and infective endocarditis in 2 pts (1%).

**Conclusions:** Although purely observational and non-representative for wider populations, the data indicate that acute pulmonary embolism is more than twice prevalent comparing to acute coronary syndromes in pts hospitalised with COVID-19.

## Clinical predictors of treatment adherence in patients with atrial fibrillation

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**Tutor:** Prof. Dzeshka Mikhail, Prof. Boiko Svetlana

**Introduction:** Treatment with oral anticoagulants (OAC) significantly reduces the risk of stroke and systemic embolism in patients with atrial fibrillation (AF), but it is associated with an increased risk of bleeding. High adherence to treatment is required to ensure both effectiveness and safety of the OAC.

**Aim of the study:** to establish clinical predictors of treatment adherence in patients with AF.

**Material and methods:** Sixty eight patients with non-valvular AF, aged 66 (58-70) years, 20 (29.4%) females, were examined. Paroxysmal AF was diagnosed in 24 (35.3%) patients, 22 (32.4%) patients had persistent and permanent arrhythmia. The median AF duration was 47 (11-83) months. In 21 (30.9%) cases AF duration was unknown. Seventeen (25%) patients previously underwent direct current cardioversion, in 7 (10.3%) cases radiofrequency ablation of AF was performed. Pacemaker was implanted in 13 (19.1%) patients. The median EHRA class was 2 (2-3), the risk of stroke according to the CHA2DS2-VASc score was 3 (2-4) points, and the risk of bleeding according to the HAS-BLED score was 2 (1-2) points. Arterial hypertension was diagnosed in 64 (94.1%) patients examined, coronary heart disease - in 60 (88.2%) cases, diabetes mellitus - in 15 (22.1%) cases.

The assessment of adherence to treatment was carried out using a clinical approach based on the analysis of information provided by the patient during the survey under the conditions of data confidentiality.

Data are presented as median, lower and upper quartiles, absolute and relative frequencies. Differences between patient groups were assessed using the Mann-Whitney test and Pearson's Chi-square tests. Odds ratio (OR) and 95% confidence interval (CI) were calculated.

**Results:** Based on the analysis of adherence 42 (61.8%) patients were classified as adherent to treatment while 26 (38.2%) patients had poor adherence. The vast majority of the analyzed clinical and anamnestic parameters appeared to be similar between patients with high adherence to treatment and those with low adherence. Adherent persons were older compared to their noncompliant counterparts - 67 (60-72) years versus 62 (56-69) years (OR 1.06, 95% CI 1.01-1.12,  $p < 0.05$ ). Patients with higher adherence had a higher risk of stroke according to the CHA2DS2-VASc score - 4 (3-5) points and 3 (2-4) points, respectively (OR 1.51, 95% CI 1.01-2.26,  $p < 0.05$ ), as well as a longer history of AF - 71 (13-95) months versus 23 (6-47) months (OR 1.02, 95% CI 1.0-1.04,  $p < 0.05$ ; for patients with established arrhythmia duration).

**Conclusions:** More than a one third of patients with AF were classified as having low adherence to treatment. Older age, higher risk of stroke and other thromboembolic complications, as well as a longer history of AF were yielded as predictors of higher adherence to treatment.

## **Concentrations of blood-borne EVs may predict left-ventricular remodelling after acute myocardial infarction**

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**Introduction:** Coronary artery disease (CAD) is a major public health problem. Improvements in the treatment of CAD decreased the short-term mortality rate after acute myocardial infarction (AMI). Therefore, long-term complications have become a leading cause of death in CAD. It was established that left ventricular remodelling (LVR) occurs in about 30% of the patients after anterior AMI and 17% after non-anterior AMI. As these complications increase the risk of heart failure (HF) and mortality rate, the pharmacological treatment is prescribed to prevent them. There are no reliable parameters to predict LVR after AMI. Consequently, the treatment cannot be tailored to an individual patient's needs. It was studied that in the course of AMI, blood cells and vascular endothelial cells release extracellular vesicles (EVs).

**Aim of the study:** The aim of the study was to assess if the concentrations of EVs may be useful as biomarkers to predict LVR after AMI.

**Material and methods:** 55 patients admitted to the hospital due to their first AMI with or without ST-segment elevation were included in the study. The plasma concentrations of EVs from endothelial cells (CD146+), erythrocytes (CD235a+), leukocytes (CD45+), platelets (CD61+), activated platelets (P-selectin+), and EVs exposing phosphatidylserine (PS) were determined within 24 hours after AMI by flow cytometry. Echocardiography was performed within 24 hours after AMI and at 6-month follow-up to evaluate a LVEDV, LVESV and left ventricle EF, calculated using biplane Simpson's technique. The LVR was defined as an increase in left ventricular end-diastolic volume by 20% at 6 months after AMI, compared to baseline. The primary end-point was the difference between the concentrations of EVs after AMI in patients with and without LVR at 6 months. The secondary end-point was the predictive value of EVs for LVR at 6 months.

**Results:** Concentrations of EVs from endothelial cells, erythrocytes and platelets predicted LVR in univariate analysis (area under the ROC curve [AUC]  $\geq 0.74$ ,  $p \leq 0.02$  for all). Concentrations of EVs from endothelial cells and erythrocytes were independent LVR predictors (OR 8.2, CI 1.3-54.2 and OR 17.8, CI 2.3-138.6, respectively) in multivariate analysis. Combining the three EV subtypes allowed to predict LVR with 83% sensitivity and 87% specificity (AUC 0.87,  $p < 0.001$ ).

**Conclusions:** Plasma concentrations of EVs from endothelial cells, erythrocytes and platelets cells are potential new predictors of LVR after AMI.

## Evaluation of Right Heart Geometry and Function in Functional Tricuspid Regurgitation Patients: Correlation Between Echocardiographic and Cardiovascular Magnetic Resonance Data

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**Introduction:** Assessment of right heart geometry and function is essential for tricuspid regurgitation (TR) patients in order to choose the eligible time for tricuspid valve (TV) surgery. Although transthoracic echocardiography (TTE) is often used for evaluation of right heart parameters, cardiac magnetic resonance (CMR) is a gold standard method for assessment of right ventricle (RV) geometry and function. The accuracy of RV echocardiographic evaluation remains controversial.

**Aim of the study:** To determine the relation between echocardiographic and CMR derived right heart geometry and function parameters in patients with functional TR.

**Material and methods:** 23 patients with confirmed functional moderate to severe TR due to left-sided valvular heart disease and who underwent tricuspid annuloplasty (2017-2020) at the Hospital of Lithuanian University of Health Sciences were retrospectively included into the study. The data of right heart geometry and function defining parameters from transthoracic 2D echocardiography (2DE), 3-dimensional echocardiography (3DE) and CMR measurements were collected before surgical TV repair. A Spearman's correlation was run to determine the relationship between echocardiographic and CMR parameters. A  $p < 0,05$  was considered statistically significant.

**Results:** There was moderately strong positive correlation between TTE and CMR derived RV parameters: RV parasternal diameter at end-diastole (2DE) and right ventricular end-diastolic volume (RVEDV; CMR) ( $r=0.614$ ,  $p=0.002$ ), RV parasternal diameter at end-systole (2DE) and RV end-systolic volume (RVESV; CMR) ( $r=0.631$ ,  $p=0.001$ ), RV basal diameter (2DE) and RVEDV (CMR) ( $r=0.532$ ,  $p=0.009$ ), RVEDV (3DE) and RVEDV (CMR) ( $r=0.567$ ,  $p=0.022$ ), RVESV (3DE) and RVESV (CMR) ( $r=0.667$ ,  $p=0.005$ ), RV end-diastolic area (RVEDA; 2DE) and RVEDV (CMR) ( $r=0.540$ ,  $p=0.005$ ), RV end-systolic area (RVESA; 2DE) and RVESV (CMR) ( $r=0.493$ ,  $p=0.017$ ), RV stroke volume (RVSV; 3DE) and RVSV (CMR) ( $r=0.551$ ,  $p=0.027$ ). Although longitudinal RV systolic function parameters (tricuspid annular plane systolic excursion and peak systolic annular velocity) (2DE) did not significantly correlate with RVEF (CMR) ( $p > 0.05$ ), but fractional area change (FAC) (2DE) ( $r=0.457$ ,  $p=0.028$ ) and RVEF (3DE) ( $r=0.662$ ,  $p=0.010$ ) shown moderate significant correlation with RVEF on CMR. Also, significant moderate-strong correlation was found between right atrial (RA) parameters (RA diameter (RAD) ( $r=0.799$ ,  $p < 0.001$ ), RA length ( $r=0.720$ ,  $p < 0.001$ ), RA area (RAA) ( $r=0.745$ ,  $p < 0.001$ ), RAA index ( $r=0.713$ ,  $p < 0.001$ ), RA volume (RAV) ( $r=0.776$ ,  $p < 0.001$ )) and RAA (CMR).

**Conclusions:** Transthoracic 2D and 3-dimensional echocardiography provides clinically useful and accurate measures of right heart chambers geometry in patients with functional tricuspid regurgitation due to left-sided valvular heart disease. Estimation of global right ventricular systolic function offers a good approximation of right ventricular function by echocardiography and is more accurate than the longitudinal function evaluation in this group of patients.

## **Hypertrophic cardiomyopathy and ECG criteria for detection of left ventricular hypertrophy**

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**Introduction:** Hypertrophic cardiomyopathy (HCM) is a common genetic heart disorder (estimated 1:200-500). Most of the patients remain undiagnosed and sudden cardiac death (SCD) can be the first symptom. HCM diagnosis consists of confirmation of hypertrophy in diagnostic imaging. Adequate ECG interpretation seems to be a widely accessible screening tool for HCM.

**Aim of the study:** The aim of the study is to assess ECG signs of left ventricular hypertrophy (LVH) in HCM population, especially in relation to SCD risk score.

**Material and methods:** Retrospective analysis of consecutive HCM patients hospitalised in tertiary cardiology center between 2017-2020 was performed. ECG records were analysed and the presence of 8 different LVH criteria was verified. SCD risk score was calculated according to ESC guidelines and 3 groups were separated: <4%, 4-6%, ≥6% of 5-year risk of death.

**Results:** Overall 53 patients (age: 54.7±15; 62% M) were diagnosed with HCM. The most frequent ECG LVH criterium was the positive Cornell voltage (40%; p<0.05) and the least frequent was the high amplitude of R in V5/V6 (11%; p>0.05). LV overload features (T wave inversion) were present in 83% of patients. ECG criteria of LVH were positive in 37 patients (70%; 32%: 1 criterium; 68%: ≥2 criteria). ECG criteria of LVH were positive in 21 (62%; 38%: 1, 62%: ≥2) patients with low (<4%, n=34), in 4 (100%; 25%: 1, 75%: ≥2) patients with intermediate (4-6%, n=4), and in 12 (80%; 33%: 1, 67%: ≥2) patients with high (≥6%, n=15) SCD risk score.

**Conclusions:** ECG criteria for LVH are present only in 70% of patients with HCM. Positive ESC LVH criteria are more frequently observed in patients with higher SCD risk score. It is crucial to interpret ECG together with a detailed analysis of LVH origin.

## Hyperuricemia as a predictor of diastolic dysfunction in patients with atrial fibrillation and heart failure with preserved ejection fraction

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**Introduction:** Atrial fibrillation (AF) is associated with progression of heart failure (HF), and it is considered to be one of phenotypic variants of HF with preserved ejection fraction (HFpEF). Myocardial remodeling, e.g. cardiomyocyte hypertrophy, apoptosis, replacement fibrosis, result in development of left ventricular (LV) diastolic dysfunction. Hyperuricemia is associated with cardiovascular risk, and experimental data supports independent effect of uricemia and its severity on myocardial remodeling.

**Aim of the study:** was to assess association between the serum level of uric acid (UA) and LV diastolic dysfunction in patients with AF and HFpEF.

**Material and methods:** We examined 274 patients with non-valvular AF and HFpEF, aged 62 (55-68) years, 101 (36.9%) were females. Paroxysmal AF was diagnosed in 150 (55%) patients, persistent and permanent AF in 65 (24%) and 59 (21%) patients, respectively. The patients were treated as per clinical guidelines for AF management including oral anticoagulation for stroke prevention, antiarrhythmia drugs, heart rate control, and management of high blood pressure and other comorbidities. Diastolic function was assessed via Doppler-derived parameters during transthoracic echocardiography. Taking into account the limitations of majority of parameters of diastolic function when performing measurements at a background of non-sinus rhythm, the ratio of the early diastolic transmitral flow velocity (E) to the early diastolic mitral annular velocity (e') was utilized as key characteristic of LV diastolic function. The measurements were carried out in areas with the least irregular rhythm on AF, averaging the values obtained in at least five cardiac cycles. The UA level was determined in blood serum by an enzymatic colorimetric method. Data are presented as median and interquartile range. Spearman correlation analysis was used to test associations between the parameters while differences between groups were assessed via the Mann-Whitney test. Study protocol was approved by the university ethical committee. Written informed consent was obtained in all study participants.

**Results:** The UA level in the examined group of patients was 395 (319-475)  $\mu\text{mol/L}$ . Hyperuricemia occurred in 132 patients (48%), 142 (52%) patients had serum UA within reference range. The E/e' ratio was associated with the UA level ( $R=0.14$ ;  $p<0.05$ ). In patients with hyperuricemia E/e' was significantly higher compared to those with a normal UA level - 9.27 (7.56-11.16) and 7.79 (6.57-10.13), respectively ( $p<0.01$ ). Significant correlation was also found between the UA level and left atrial volume index (LAVi,  $R=0.16$ ;  $p<0.05$ ). In patients with hyperuricemia, the LAVi was significantly higher compared to those with a normal UA level - 49.7 (42.1-61.3)  $\text{ml/m}^2$  and 45.5 (36.8-56.4)  $\text{ml/m}^2$ , respectively ( $p<0.01$ ).

**Conclusions:** Hyperuricemia is common finding in patients with AF and HFpEF. Serum UA level is associated with LV diastolic dysfunction.



## **Medical, organisational and patient-related factors affecting time from symptoms to admission and Door-to-Baloon Time (DTBT) in patients with ST-segment elevation myocardial infarction (STEMI).**

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**Introduction:** Recent guidelines published by the European Society of Cardiology recommend Door-to-Baloon Time (DTBT) as less than 90 minutes in patients transported to the emergency unit (EU) by the emergency medical system (EMS) or less than 60 minutes in patients primarily diagnosed in EU. Numerous existing factors affect the time regime for both patient and medical related to age, gender, comorbidities and previous medical history. The influence of most of those factors on time from the start of pain to admission and on DTBT has not been investigated so far.

**Aim of the study:** The purpose of this study was to define medical, organisational and patient's connected factors affecting the time of patient's symptoms before admission and DTBT.

**Methods:** This was a single-center retrospective study; we evaluated patients admitted to University Clinical Center in Gdańsk with ST-segment elevation myocardial infarction (STEMI) primarily treated with Percutaneous Coronary Intervention (PCI) from January 1, 2015 to December 31, 2016. 331 (median age  $62.95 \pm 12.23$  years) patients were enrolled in this study. Patients were divided by the time from pain to admission (group 1:  $\leq 12$  hours,  $n=222$ ; group 2:  $>12$  hours,  $n=72$ ) and by DTBT (group 1:  $<90$  minutes,  $n=163$ ; group 2:  $\geq 90$  minutes  $n=168$ ), causes of delay were studied in each group.

**Results:** The median time from symptoms to admission was 3 hours, it was prolonged in 72 patients (21.75%). In the group with the delay patients were older ( $61.55 \pm 12.27$  vs  $65.81 \pm 12.7$   $p=0.012$ ), there were more woman (25.68% vs 38.03%  $p=0.045$ ) renal failure occurred more often (3.74% vs 10.29%  $p=0.036$ ), CK-MB level was lower (65.5 vs 33.8  $p=0.003$ ), dyslipidemia occurred more rarely (75.91% vs 61.43%  $p=0.018$ ). The median DTBT among our population was 92 minutes, DTBT were prolonged in 168 patients (50.76%). In group with the delay patients were older ( $60.60 \pm 11.45$  vs  $65.12 \pm 12.55$   $p<0.001$ ), there were more women (23.9% vs 33.7%  $p=0.045$ ), lower clearance by MDRD calculator (96.62 vs 88.80  $p=0.015$ ), renal failure occurred more often (2.67% vs 8.81%  $p=0.021$ ) longer time of pain before admission (3.00 vs 7.75  $p<0.001$ ), lower hemoglobin level (14.7 vs 14.1  $p=0.047$ ), lower CK-MB level (78.2 vs 37.75  $p=0.001$ ), less cardiac arrest (20.75% vs 11.63%  $p=0.042$ ), higher score in GRACE scale (111.5 vs 119.5  $p=0.047$ ), chronic lung disease occur more often (2% vs 6.59%  $p=0.047$ ) Moreover, there was a difference in Tnl level at the admission day between the groups, although it didn't reach the statistical significance (31.00 vs 21.50  $p=0.09$ ).

**Conclusions:** More co-existing diseases that affect patient was related to shorter time from first symptoms to admission and longer DTBT. This can indicate that patients with many diseases are more aware of vicious symptoms of STEMI but on the other hand their comorbidities complicate rapid diagnostic procedures in emergency unit. Moreover, the coincidence between DTBT and patient's related delay can point to communication problems.

## **Nitric oxide/L-arginine-related pathway metabolites are altered in patients after myocardial infarction and predict adverse outcomes**

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**Background:** Acute myocardial infarction (AMI) is the leading cause of morbidity and mortality worldwide. Damage to the endothelium is the earliest event in atherothrombosis, including AMI. Nitric oxide (NO), an endothelium-derived compound, protects the vasculature from damage.

**Aim of the study:** This study evaluated whether an association exists between plasma concentration of endogenous NO/L-Arginine (Arg)-related pathway metabolites linked to AMI and major adverse cardiovascular events (MACE) after AMI.

**Materials and Methods:** We compared plasma concentrations of NO/L-Arg-related pathway metabolites in patients after AMI (n=60) and healthy controls (n=27) and investigated the prognostic value of these metabolites for post-AMI MACE development over a median of 3.5-years.

**Results:** Concentrations of asymmetric dimethylarginine (ADMA) and symmetric dimethylarginine (SDMA) were higher in patients after AMI compared to controls ( $p=0.0068$ ,  $p<0.0001$ , respectively). Conversely, the concentration of citrulline was lower in the AMI group ( $p=0.0006$ ). The concentration of SDMA was higher in patients who developed MACE than in those who did not ( $p=0.015$ ) and was the only independent predictor of MACE in multivariate analysis ( $p=0.023$ ). There was an intermediate, negative correlation between plasma SDMA level and platelet reactivity ( $r=-0.33$ ,  $p=0.02$ ).

**Conclusion:** Plasma concentration of SDMA and ADMA differ between patients with AMI and healthy volunteers. The study's novel finding is that SDMA is an independent predictor of MACE during a 3.5 years follow-up period after AMI.

## Non-invasive risk factors in patients with acute ischemic stroke

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**Introduction:** Recently, the diagnosis of cardiogenic stroke is rising. The most common cause remains atrial fibrillation (AF). Significance of sudden cardiac death risk factors in a group of such patients is unknown.

**Aim of the study:** The aim of our study was to assess sudden cardiac death risk factors such as HRV, HRT, DC parameters in patients with acute ischemic stroke.

**Methods:** The study group consisted of 95 patients (46 female, age  $60\pm 14$  years), divided into two subgroups based on the localization of the brain stroke: TACI – total anterior circulation infarct (35 patients), non-TACI – other locations. The 2 years follow-up was performed, the composite endpoint, which consisted of the confirmed atrial fibrillation or next brain stroke or hospitalization or death was defined. The parameters were calculated from 7-days Holter recording (Reynolds Healthcare Sentinel and qtHRT software). Parameters of HRV: SDNN, RMSSD, pNN50; HRT: onset, slope and DC were assessed.

**Results:** Patients with composite endpoint during the follow-up had lower RMSSD, pNN50, HRT slope, DC than patients without composite endpoint: ( $22,4\pm 11$  vs.  $30,3\pm 12$ ;  $p=0,02$ ); ( $4,2\pm 5$  vs.  $6,9\pm 6$ ;  $p=0,03$ ); ( $5,1\pm 6$  vs.  $8,1\pm 8$ ;  $p=0,04$ ); ( $6,4\pm$  vs.  $8,2\pm 9$ ;  $p=0,04$ ), respectively. HRT onset was higher in the group with composite endpoint in comparison to the one without it ( $-0,63\pm 2$  vs.  $-1,99\pm 2$ ;  $p=0,005$ ). SDNN values were statistically insignificant. Scores obtained from CHA2DS2-VASc and HAS-BLED scales were higher in the group with composite endpoint than in the group without it (CHA2DS2-VASc score:  $5,2\pm 2$  vs.  $4,3\pm 1$ ; HAS-BLED score:  $2,5\pm 1$  vs.  $2,3\pm 1$ , respectively).

**Conclusions:** Patients with composite endpoint had lower values of all assessed death risk factors, apart from HRT onset, which was higher in a group with composite endpoint. It may suggest higher risk of SCD in this group. However, further investigation of these parameters is necessary.

## **Patient adherence to antihypertensive medications during arterial hypertension therapy**

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**Aim of the study** is to evaluate medication adherence in hypertensive patients. The Morisky Medication Adherence Scale (MMAS-8) is a commonly used survey. It has been validated in patients with chronic diseases, providing reliable results on drug adherence.

**Method:** Prospective research at Pauls Stradiņš Clinical University Hospital. The selection criteria were respondent age over 18 years, diagnosis of arterial hypertension and use of blood pressure lowering medications for at least six months. MMAS-8 was evaluated against measured arterial pressure using manual blood pressure monitor.

**Results:** The study involved 81 participants with hypertension - 31 women and 50 men - all of whom had been taking antihypertensive medicines for at least six months. The mean age of total respondents was 66.6 years, where 64.6 years and 69.8 years for male and female, respectively. The average level of adherence was 6.57 (SD = 1.61): the adherent group consisted of 66 respondents. The prevalence of non-adherence to medications was 18.52%. Adherent respondents in age 65 and older with systolic blood pressure (SBP) below and above 140 mm Hg consisted of 24 and 15, respectively. In spite that respondents younger than 65 years with SBP below and above 130 mm Hg consisted of 13 and 14, respectively. While non-adherent respondents in age 65 and older with SBP below and above 140 mm Hg consisted of 4 and 2, respectively. Along with non-adherent respondents younger than 65 years with SBP below and above 130 mm Hg consisted of 13 and 14, respectively.

**Conclusions:** We found poor correlation between patient adherence to medications using MMAS-8 scale in different age groups to target clinic blood pressure. Further investigation of the concentration of blood pressure lowering medications in patient's blood would give more reliable results about adherence to medication.

## Region-related differences in patients living with an ICD during COVID-19 pandemic

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**Introduction:** Implantable cardioverter-defibrillator therapy (ICD) with or without cardiac resynchronization (CRT) is common among patients at risk for malignant ventricular arrhythmias. Due to the rapid spread of SARS-CoV-2 not only healthcare systems, but also patients' physical and mental health was affected. It is known that ICD changes patients' quality of life, but the additional impact of COVID-19 and the possible region-related differences are less well known.

**Aim of the study:** To perform a comparative assessment regarding the psychosocial impact of COVID-19 pandemic among patients living with an ICD in two geographically different groups (HU, n=17 vs. RO, n=48).

**Material and methods:** Participants completed anonymously a quantitative purpose-designed online survey, which contained 45 multiple-choice questions assessing demographic data, healthcare and device follow-up, COVID-19 exposure and emotional impact of the pandemic.

**Results:** Participants in the HU group were younger than those in the RO (< age of 65 years 100% vs. 85.42%), lived alone (47% vs. 8.33%), and device indication was mostly primary prevention (59% vs. 20.83%). CRT-D ratio was similar among the two group (12% HU vs. 20% RO).

The need for not COVID-19 related healthcare assistance was met in both groups (71% HU vs. 85.42% RO). Device follow-up was postponed (82% HU vs. 68.75% RO), mainly on physicians' recommendation. None of the participants was confirmed with COVID-19 infection.

Among both groups almost half of the patients reported a major change in day-to-day life induced by COVID-19 pandemic, although their mood was affected significantly in a different way (became worse 41% HU vs. 16.67% RO). Those from the HU group reported higher rates of anxiety (59%) and frustration (24%), while RO group felt mainly grateful (37.5%) and calm (43.75%).

Patients' concerns were similar in both groups: inability to access healthcare (59% HU vs. 60.42% RO) and medication (35% HU vs. 47.92% RO). As expected, the most affected areas of life were: social life (41% HU vs. 58.33% RO) and physical activity (24% vs. 39.58%). Nearly one-third of the patients (29% HU vs. 37.50% RO) expressed the need for more information about living with and ICD during pandemic.

**Conclusion:** There was a difference regarding the psychosocial impact of COVID-19 between the two groups; the HU group reported a decline in QoL. Generally, participants were well informed about device type and indications, although the need for ICD and COVID-19 related information was met in one-third of the cases. Poor knowledge is one of the risk factors which serve as a marker for psychosocial attention. Therefore, patient education is of uppermost importance in order to improve QoL.

**Results of a preliminary survey illustrating prevalence and severity of cardiac disease in Polish patients with Williams syndrome juxtaposed with a case of male infant with Williams syndrome and complex cardiovascular defects**

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**Introduction:** Williams syndrome (WS) is a multisystemic disorder that affects connective tissue and both cardiovascular and central nervous systems and is observed in 1/10 000 newborns. Patients with WS have a specific elfin-like phenotype, an ebullient personality profile accompanied by a lower intelligence quotient and cardiovascular abnormalities observed in almost 80% of patients with WS.

**Aim of the study:** Assessing the results of a preliminary survey illustrating prevalence and severity of cardiovascular disease in Polish patients with Williams syndrome.

**Method:** A questionnaire using Google Forms has been prepared. It comprised questions concerning the following data: age and sex of the patient with WS, parents' age at delivery, a familial history of WS, the patient's age at the first cardiac consultation, detected cardiovascular abnormalities and treatment options used, the patient's age at the time of WS diagnosis, and abnormalities observed before the diagnosis. For statistical analysis Statistica software (StatSoft, USA) has been used.

**Results:** We obtained results from 18 families of patients with WS. The median age of patients with WS was 4.6 (2.46–7.5) years. The median parents' age at the time of child's birth was 28 (27–31.5) years in mothers and 31.5 (29–35.75) years in fathers. Williams syndrome was diagnosed only postnatally at the median age of 13 (8.25–17.75) months. The main reasons for further genetic testing leading to the diagnosis of WS were dysmorphism (77.78%), cardiovascular abnormalities (72.22%), slow or poor infant weight gain or short stature (33.33%), psychomotor development retardation (27.78%), and hypothyroidism (16.67%). Other reported signs included constipation, enamel defects, hernias, hydrocele, a protruding mandible, and renal abnormalities. No family had a positive history of WS.

All patients underwent cardiac examination. The first cardiac consultation was performed at the child's median age of 1 (0–3) month. The most prevalent cardiovascular abnormalities were pulmonary artery stenosis (61.11%), aortic stenosis (38.89%), VSD (11.11%), and aortic valve defects (11.11%). Other abnormalities included cyanosis, hypertrophic cardiomyopathy, mitral valve defect, murmurs, patent ductus arteriosus, pulmonary valve defect, and aneurysm.

**Conclusions:** Cardiovascular abnormalities in WS have a broader spectrum than described in the literature so far. Being small for gestational age or IUGR accompanied by cardiovascular defects can be first and main WS abnormalities detected prenatally. After birth, such findings can be slow or poor infant weight gain or short stature. Postnatal cardiac consultation, on average, precedes the final diagnosis by a year.

## Sacubitril/valsartan in systolic heart failure (HFrEF) – Two years of clinical experience

Edward Kothalawala

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**Presenting author:** Edward Kothalawala

**Tutors:** MD Arnold Péter Ráduly, MD PhD Attila Borbély

**Introduction:** According to international randomized trials the novel angiotensin receptor-neprilysin inhibitor (ARNI) sacubitril/valsartan is extremely effective in the treatment of patients with heart failure with reduced ejection fraction (HFrEF) reducing hospitalizations associated with heart failure (HF) and improving prognosis. The drug became available to Hungarian patients based on an individual authorization procedure in 2018.

**Aim of the study:** The aim of the study was to investigate the clinical characteristics and laboratory parameters relevant to HF in patients with HFrEF before and after treatment with ARNI at the University of Debrecen Clinical Center, Department of Cardiology and Cardiac Surgery between 2018 and 2019.

**Materials and methods:** To assess drug efficacy changes in NYHA functional class, left ventricular ejection fraction (EF) and NT-proBNP plasma levels were determined. Alterations in renal function (GFR) and plasma potassium levels were measured to investigate the safety of the drug (statistics: Wilcoxon signed rank test, paired T test,  $P < 0.05$ ).

**Results:** 48 HFrEF patients (mean age  $57.8 \pm 13.7$  years, 8 women, 40 men) with optimized, guideline-based HF therapy were included in the study. The etiology of HF was dilated cardiomyopathy (CM) in 64.6% and ischemic CM in 35.4% of the patients. After administration of ARNI there was a significant improvement in the NYHA functional class (NYHA IV: 2.2%, NYHA III: 80.4%, NYHA II: 17.4% vs NYHA III: 28.3%, NYHA II: 71.7%) and left ventricular EF ( $28.4 \pm 0.8\%$  vs.  $25.3 \pm 1.0\%$ ,  $P < 0.05$ ) in addition to a significant decrease in NT-proBNP plasma levels ( $1894 \pm 350$  ng/L vs.  $3243 \pm 652$  ng/L,  $P < 0.001$ ). GFR remained unaltered ( $71.7 \pm 2.5$  vs.  $71.7 \pm 2.7$  mL/min/1.73m<sup>2</sup>) and no clinically relevant hyperkalemia occurred upon ARNI treatment.

**Conclusion:** In the studied HFrEF patient population sacubitril/valsartan significantly improved functional capacity, echocardiographic and laboratory parameters relevant for HF.

## **Sacubitril/Valsartan: across the spectrum of patients with heart failure with reduced ejection fraction**

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**Tutors:** Prof. Katarzyna Mizia-Stec, Prof. Katarzyna Mizia-Stec

**Introduction:** Combination of neprilisin inhibitor (Sacubitril) and angiotensin receptor blocker (Valsartan) is a new promising therapeutic option in patients (pts) with heart failure with reduced left ventricular ejection fraction (HFrEF). It is now recommended ahead of all other renin-angiotensin-aldosterone system inhibitors, however, our experience in this field is limited.

**Aim of the study:** To compare clinical profile and mortality in pts with HFrEF receiving and non-receiving Sacubitril/Valsartan (S/V).

**Materials and methods:** Overall 613 pts (507M, mean age 67.1±11.7) with HFrEF hospitalized (the first hospitalization for HF) in 2018-2020 were enrolled into retrospective cross-sectional analysis. The study population was categorized into pts receiving [82 / 13.4% pts (71M, mean age 63.8±13)] and not-receiving [531 pts (436M mean age 67.7±11.4)] S/V. Then based on S/V subgroup included age, sex, BMI and LVEF matching was performed by using the 1:1 nearest neighbour method without returning. Finally two groups (S/V and nonS/V) of 64 pts were obtained and analysed regarding clinical characteristic and mortality in 1-2 year follow-up.

**Results:** In S/V group a higher percentage of pts with post-infarction cardiomyopathy (p=0.003), atrial fibrillation (p=0.017), cardiac resynchronization therapy (p=0.038) were observed. There was no difference in mortality between the groups (S/V group: 18 / 28%pts, 17 M; nonS/V 18 /28%pts, 18M). In both groups mortality was associated with higher NYHA class (S/V group: p=0.037; nonS/V group: p=0.05). In nonS/V group advanced tricuspid regurgitation (p=0.02) increased and coexisting hypertension (p=0.004) and coronary arterial disease (p=0.049) decrease the death incidence.

**Conclusions:** Our current experience in S/V therapy is limited to the extremely severe pts with HFrEF. Mortality in HFrEF population is high and advanced HF seems to be the most important factor influencing the high death ratio.



## **Six Minute Walk Test – the simple but valuable diagnostic method of evaluating symptomatic patients after acute pulmonary embolism**

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**Tutors:** MD PhD Olga Dzikowska-Diduch, MD PhD Piotr Bienias

**Introduction:** The diagnosis of chronic thromboembolic pulmonary hypertension (CTEPH) can be challenging. Recent European Society of Cardiology guidelines recommend echocardiography as the first step in the diagnostic process. However, this examination without significant abnormalities does not exclude pulmonary hypertension. Deterioration of exercise tolerance is the opening symptom in most cases. It is therefore advisable to objectively assess physical efficiency of patients suspected of the diagnosis. Performing 6 Minute Walk Test (6MWT) is a simple, non-invasive and inexpensive way to achieve this goal.

**Aim of the study:** Confirmation whether the 6MWT results can be used to differentiate patients after pulmonary embolism with suspected CTEPH.

**Methods:** 81 symptomatic pulmonary embolism survivors (44 women, 37 men) were analyzed retrospectively. In addition to the standard evaluations, all of them had passed 6MWT. Finally, CTEPH was confirmed in 45 patients and ruled out in 36 individuals. The results of 6MWT distance, dyspnea on the modified 0-10 Borg scale, heart rate change and also desaturation occurrence and saturation changes were analyzed. Standard statistical methods were used for comparing studied groups.

**Results:** In each parameter the group with CTEPH-diagnosed patients achieved worse results. The mean distance reached by the CTEPH-group was  $311,9 \pm 112$  m while in the non-CTEPH  $420,9 \pm 169,1$  m (p-value 0,0008). Desaturation % in the CTEPH-group presented as a median with range was 1 (0-16) and in the non-CTEPH 0 (0-12) (p-value 0,01). Exacerbation of dyspnea in Borg scale (also presented as a median with range) was 4 (0,5-10) points in the CTEPH-group and 3 (1-8) points in the non-CTEPH (p-value 0,31). Mean increase in HR after 6MWT showed  $17,6 \pm 19,9$  bpm in the CTEPH-group while  $16,8 \pm 15,1$  bpm in the other (p-value 0,78).

**Conclusions:** In the long-term process of diagnosing patients after pulmonary embolism, 6MWT can prove to be a helpful, effective and easily accessible tool. Patients with CTEPH show marked reduced functional exercise capacity in comparison to pulmonary embolism survivors without CTEPH. Cardiopulmonary exercise testing and other tools recommended for follow-up after acute pulmonary embolism are not widely available in some instances. 6MWT can be easily performed in any institution since it does not require specialized personnel or expensive equipment.

## The difference between two statin drugs and effectiveness on hypercholesterolemia and mixed hyperlipidemia

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**Tutors:** Prof. Kārlis Trušinskis, Prof. Kārlis Trušinskis

**Aim of the study:** Statin therapy is useful for primary and secondary prevention of coronary heart disease in patients with dyslipidaemias. The mechanism of action - reduce total cholesterol (TC), low-density lipoprotein (LDL) cholesterol, serum triglycerides concentration, and increase high-density lipoprotein (HDL) cholesterol level. The aim is to compare the effectiveness between Rosuvastatin and Atorvastatin. Another purpose is to assess whether the effects are dose-dependent.

**Method:** Prospective research, interviewing patients who are undergoing coronary angioplasty in Pauls Stradiņš Clinical University Hospital and taking statins daily. Collecting samples of blood to assess a lipoprotein panel in the period from July 01, 2020 to December 01, 2020.

**Results:** Fifty-nine patients were interviewed. A lipoprotein panel was assessed from 22 (37%) women and 37 (63%) men. 21 (36%) patients were taking Atorvastatin in dose range from 10 to 80 mg, other 38 (64%) patients used Rosuvastatin - 10 to 40 mg.

Patients who had a normal total cholesterol level: 86% - Atorvastatin, 92% - Rosuvastatin. Mean difference between two groups (Rosuvastatin/Atorvastatin) = -0,44 mmol/l, statistically not significant ( $p > 0,05$ ).

45% Rosuvastatin and 24% Atorvastatin group patients had a normal LDL cholesterol level. Mean difference between two groups (Rosuvastatin/Atorvastatin) was equal to -0,47 mmol/l which is statistically significant ( $p = 0,035$ ).

Those who had a normal HDL cholesterol level: 52% - Atorvastatin, 39% - Rosuvastatin. Mean difference between two groups (Rosuvastatin/Atorvastatin) = -0,05 mmol/l, statistically not significant ( $p > 0,05$ ).

66% Rosuvastatin and 81% Atorvastatin group patients had a normal triglycerides level. Mean difference between two groups (Rosuvastatin/Atorvastatin) = -0,29 mmol/l, statistically not significant ( $p > 0,05$ ).

**Conclusions:** The results indicate that there is no statistically significant difference between two statin drugs. Rosuvastatin is better than Atorvastatin in lowering the level of LDL cholesterol.

## The Impact of Body Mass Index on Parameters of the Left Atrium

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**Tutors:** Prof. Oskars Kalējs, MD PhD Ligita Zvaigzne

**Introduction:** The body mass index (BMI) is calculated by dividing the weight of the person in kilograms by height in meters squared. Increased BMI is often used a predictor for cardiovascular diseases. Enlargement of the left atrium and muscular sleeves found around pulmonary vein (PV) orifices are known to be the factors associated with atrial fibrillation (AF).

**Purpose:** The aim of the study was to find out statistically significant associations between BMI and parameters of the left atrium found in cardiac computed tomography (CT) scan.

**Material and methods:** The retrospective study included 145 patients, all of them underwent cardiac multi-slice CT scan analysis. The evaluation of the left atrium was performed by making several 3-dimensional reconstruction models of the heart during the cardiac cycle.

**Results:** The mean age of the patient group was 66.9 years (SD=7.8), 75.9% (110) were men. There were found statistically significant correlations between BMI and volume of the left atrium: maximal volume of the left atrium ( $r_s=0.199$ ,  $p=0.023$ ), minimal volume of the left atrium ( $r_s=0.177$ ,  $p=0.043$ ), mean volume of the left atrium during the cardiac cycle ( $r_s=0.190$ ,  $p=0.029$ ). The volume of the left atrial appendage did not show any statistically significant correlation with BMI ( $p=0.354$ ).

The diameter of the left inferior PV orifice showed positive correlation with BMI ( $r_s=0.216$ ,  $p=0.032$ ), but the diameter of the left superior PV did not show any association with BMI ( $p=0.189$ ).

The diameter of the PV orifices on the right side showed statistically significant correlation with BMI ( $r_s=-0.629$ ,  $p=0.012$ ), only if there were more than 3 PV orifices on the right side.

BMI had statistically significant positive correlation with PV angle on the right side ( $r_s=0.178$ ,  $p=0.044$ ), the angle between left PV did not show any correlation with BMI ( $p=0.436$ ).

**Conclusions:** The research showed a statistically significant impact of the body mass index on the parameters of the left atrium, which are associated with atrial fibrillation development. The results support previously known associations between increased BMI and left atrial enlargement and shows the effect of the increased BMI on characteristics of the pulmonary veins.

## **Thrombosis and Bleeding Risk in the Association between Anticoagulant and Antiplatelet Therapy in Patients with Acute Myocardial Infarction**

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**Tutors:** MD Lina Bardauskienė

**Introduction:** Acute myocardial infarction (AMI) remains one of the foremost causes of mortality rate globally. Patients with AMI irrespective of whether or not performed percutaneous coronary intervention (PCI) with stenting do benefit from a dual antiplatelet (DAPT) therapy, which is the standard treatment and care to reduce recurrent ischemic events and prevents from the stent thrombosis after PCI. While the safety and efficacy of an oral anticoagulant (OAC) is clinically evaluated, in addition to dual antiplatelet therapy it is associated with an increase in bleeding events and significantly reduces coagulation activity with recent AMI events.

**The aim of the study:** To evaluate the association between antiplatelet and anticoagulant therapy, its risk of bleeding and thrombosis in patients, hospitalized with AMI.

**Material and methods:** The study included 91 patients diagnosed with AMI and admitted to the Hospital of Lithuanian University of Health Sciences, Kaunas Clinics from January 2020 until March 2020. After hospital-discharge, patients were followed up for 6 months for any ischemic events or bleeding occurrence. Statistical analysis was performed with SPSS Version 27.0 statistic software package. A  $p < 0,05$  was considered statistically significant.

**Results:** 61 men (67.0%) and 30 women (33.0%) with AMI were admitted to the Kaunas Clinics. The average age of patients was  $69.74 \pm 11.70$  (youngest 39 years, oldest 94 years old). 36 patients had AMI with ST elevation (39.6%). PCI was performed in 64 patients (70.3%), coronary artery bypass surgery - 10 patients (11.0%). During the period of 6 months, bleeding was observed in 11 patients (12.1%), whereas ischemic events were detected in 37 patients (40.7%). Administration of antiplatelet agents and anticoagulants: aspirin - in 91.2% of patients, ticagrelor - in 59.3%, clopidogrel - in 23.1%, warfarin - in 15.4%, non-vit-K antagonists - in 9.9%, two antiplatelet agents and anticoagulant - in 16.5%. Both aspirin and ticagrelor were more often given to younger individuals ( $r = -0.34$ ,  $p < 0.001$ ) after AMI with ST elevation ( $r = 0.21$ ,  $p = 0.04$ ), and undergoing PCI ( $r = 0.59$ ,  $p < 0.001$ ). Administration of two antiplatelet agents and an anticoagulant was more common in elderly patients ( $r = 0.27$ ,  $p = 0.01$ ). Bleeding events were more frequent after administering oral anticoagulants ( $r = 0.25$ ,  $p = 0.02$ ) while ischemic events occurred less in patients taking warfarin ( $r = -0.23$ ,  $p = 0.03$ ). The use of antiplatelet agents was not associated with bleeding nor ischemic events.

**Conclusions:** The use of oral anticoagulants increases the risk of bleeding, however significantly reduces the risk of ischemic events recurrence. Therefore, it is essential to evaluate an individual patient's risk in each case.

## Treatment delay and in-hospital outcomes in acute myocardial infarction during COVID-19 pandemic: experience in one of PCI centers in Lithuania

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**Tutors:** Prof. Olivija Gustienė

**Introduction:** The COVID-19 outbreak has had a huge impact on the treatment and outcomes of patients (pts) with acute myocardial infarction (MI) (1). The pandemic of COVID-19 could cause an overload of the emergency medical systems, decreased awareness of pts fear of infection and that could lead to not receiving proper treatment (2).

**Aim:** To assess the impact of the COVID-19 outbreak on incidence, delays and outcomes of pts with acute MI pts undergoing percutaneous coronary intervention (PCI).

**Methods:** The study involved the pts with ST-segment elevation MI (STEMI) and non-ST-segment elevation MI (NSTEMI) - treated with PCI in Lithuanian Health Sciences University Hospital in 2019-2020. The 2020 2nd quarter (qtr) matched the first COVID-19 pandemic lock-down, the 2020 4th qtr matched the second lock-down, the 2019 2nd and 4th qtr matched a pre-pandemic period. We compared demographic, logistical parameters and in hospital mortality rate. Statistical analysis was performed using SPSS 22.6 software. Continuous variables with normal distribution were presented as mean ( $\pm$ SD); non-normal variables - as median (minimum; maximum). P value <0.05 was considered significant data.

**Results:** The overall sample consisted of 917 pts with NSTEMI (2019, n=530 vs 2020, n=387) and 1077 STEMI (2019, n=599 vs 2020, n=478). There were no statistically significant changes in age and gender within the 2019, 2020 years. Annual in-hospital mortality rate comparing 2019 and 2020 years in pts with STEMI increased (6.84% vs 10.06%, p=0.049), in NSTEMI was (4.77% vs 4.66%, p=0.310). Comparing 2019 2nd qtr and the first lock-down in 2020 mortality rate had a tendency to increase: 6,83% vs 9,01%, p=0.497 in STEMI pts; 3,47% vs 7,69%, p=0.156 in NSTEMI pts. Comparing 2019 4th and the second lock-down it was 6,5% vs 7,5%, p=0.779 in STEMI pts; 6,1% vs 2,5%, p=0.240 in NSTEMI pts. Comparing the 2019 2nd qtr and first lock-down in 2020 there was a significant delay from door to coronary angiography (CA) (29(1;1005) vs 45(3;885) min, p<0,001) and to wire crossing for PCI (48(6;1015) vs 67(13;900)min, p=0.001) in STEMI pts. The same data was found in NSTEMI pts: increased pain to admission time (585 (3;1435) vs 687(13;1420) min, p=0.047), admission to CA time (145 (7;1410) vs 407 (20;1421)min, p<0.001) and to wire crossing for PCI time (169(10;1397) vs 495(21;1432) min, p<0.001), respectively. Comparing the 2019 4th qtr and second lock-down time there was a significant delay from door to CA (213(7;1391) vs 479(33;1307) min, p=0.006) and wire crossing for PCI (228(8;1411) vs 504(40;1337) min, p=0.002) in pts with NSTEMI.

**Conclusions:** The first lock-down caused a significant delay in time from admission to CA and PCI in pts with STEMI and NSTEMI pts. Also, the first lock-down caused delay in pain to admission time in NSTEMI pts. These delays remained stable in second lock-down only in NSTEMI pts. Delayed reperfusion could cause worse outcomes and increase mortality.

## Comparative analysis of ECG recordings depending on body position in model animals

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**Tutors:** Prof. Agnieszka Noszczyk-Nowak

**Introduction:** Electrocardiography is a method widely applied in the diagnosis of abnormalities in the functioning of the heart muscle in both human and veterinary medicine. It is non-invasive and easy to perform test helpful in the general examination and a widely used method of patient monitoring during anesthesia. In addition, animals are widely used as models in research to understand the cause, nature, and treatment options for human diseases. High analogies in the structure of the cardiovascular system, such as the size of the vessels and heart cavities, heart rate, and physiological reactions as well as other systems, make swine commonly used as model animals in biomedical research. It is particularly important to use them in electrophysiology as a model for humans. Swine is an animal that is widely available and raises less public opposition as a laboratory animal than many other animal species.

**Aim of the study:** The aim of the planned experiment was to compare the ECG recordings made with two different body positions and determine if any differences occurred.

**Materials and methods:** Standard ECG in swine is performed under general anesthesia in the lying position on the right side, for this position of the body have been developed and reported standards in the literature. However, some procedures performed on swine require a different body position, for which there is less data in literature.

The study was carried out on 29 Polish landrace pigs weighing in the range of 33 - 44 kg. The tests were performed under general anesthesia with the same protocol for each animal, placing the animals first lying down on their right side, and then on their backs. The anesthesia protocol included medetomidine, midazolam, ketamine, and propofol. During the examination, ECG records were performed and analyzed in a 12-lead system with software support. The procedures carried out were approved by the local ethics committee.

**Results:** The results show significant differences in electrocardiogram recordings depending on the animal's body position. Those differences mainly concern the amplitude of the P wave and R wave in the rerecordings and are even more visible comparing the electrocardiograms of the same specimen. There are also some significant differences in the duration of intervals.

**Conclusions:** In conclusion, the body position has a significant impact on the ECG recording, therefore performing this examination, chosen normative value tables should be compatible with the position of the examined animal. ECG recordings vary individually in swine, and according to that fact, the anesthesiologist should choose a lead with the best quality record for monitoring in certain specimens during anesthesia. Medetomidine used in the anesthesia protocol, among its side effects, includes induction of first and second-degree atrioventricular blocks, therefore the occurrence of these abnormalities might be considered as a standard condition.

## **CARDIOSURGERY AND INTERVENTIONAL CARDIOLOGY**

**COORDINATORS:** Aleksandra Gaudynek, Patrycja Kroskowska

**JURY:**

Prof Andrzej Lubiński MD PhD

Piotr Kaźmierczak MD

## Long-term outcome evaluation in patient undergoing deep hypothermic circulatory arrest in aortic arch surgery

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**Presenting author:** Edwards Kalnins

**Tutor:** MD Roberts Leibuss, MD PhD. Eva Strike

**Introduction:** Aortic dissection usually is associated with low survival rates because of high prehospital and intraoperative mortality with great postoperative complication risk. Since 1985 deep hypothermic circulatory arrest (DHCA) is often used in this type of surgeries. Its main advantage is to provide bloodless surgical field while protecting brain tissue with hypothermia. Nevertheless, it still raises concerns of increasing neurologic sequelae and probable decrease of long-term quality of life.

**Aim of study:** To study and evaluate the possible effect of DHCA used in aortic surgery on patients' long-term quality of life in a retrospective cross-sectional study.

**Material and methods:** From January 2019 to December 2020 24 patients had undergone aortic surgery requiring DHCA, 7 of those were excluded because of intrahospital death. For the rest of the patients Quality of life was evaluated using RAND SF36 questionnaire and MMSE test. Data regarding demographics, clinical characteristics, operation type, duration of circulatory arrest, Rectal and bladder temperatures were collected and analysed with IBM SPSS, a P value of less than 0.05 was considered significant.

**Results:** Of the 17 patients included in the study, 12 (71%) were men and 5 (29%) were women. Their mean age  $60,71 \pm 13,8$  years. Leading co-morbidity was PAH (64.7%). There were 6 (35.3%) elective and 11 (64,7%) emergency cases. Mostly there was Stanford A dissection (82.4%). 94.7% had aortic arch replacement. Most common postoperative complication was infection-29.4%.

The mean cardiopulmonary bypass time, aortal obstruction and reperfusion time was  $212 \pm 38,3$ ,  $124 \pm 33,8$  and  $70,2 \pm 32,9$  minutes, respectively. Core temperature during DHCA was  $23,2 \pm 3,2$ . Rewarming rate was  $0,12 \pm 0,07$  C/min. No statistically significance between QOL and lowest DHCA temperature (p 0.059), Ao (p 0,544), reperfusion time (p0,618), CPB time (p 0.305) was observed. QOL and rewarming rate showed statistical significance (p 0,02). Mean long term quality of life was  $71.9 \pm 10.2\%$  and mean cognitive result was  $27.9 \pm 5,3$ .

**Conclusions:** There was no statistical significance between lower quality of life and average temperature, Ao, CPB DHCA duration (p>0.05). Only rewarming time was found to be correlating with QOL. Compared to other studies QOL was the same or higher but compared to general population QOL is slightly decreased.



## **Is the use of Supera Peripheral Stent System a challenge for surgery in the treatment of femoropopliteal lesions?**

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**Presenting author:** Fratila Maria Mirabela

**Tutor:** MD Catrina Bianca

**Introduction:** An impressive number of people around the world suffer from lesions of the femoropopliteal artery. Although a range of endovascular interventions have been performed at the femoropopliteal segment, their durability has been negatively influenced by the biomechanical forces acting at this level. Supera Peripheral Stent is a small nitinol interwoven tube, an innovative technology, which could provide improved clinical results.

**Aim of the study:** the aim of this presentation is to assess the efficiency of Supera stents in comparison to surgical interventions for the femoropopliteal artery and underline whether or not this proves to be a highly competitive tool.

**Material and method:** Supera Stents have already been used to treat 5 patients at the Interventional Cardiology Department presenting with common femoral artery and popliteal artery stenosis. They have been diagnosed based on their clinical manifestations such as claudication and paraclinical investigations: the ankle- brachial index, and conventional angiography for confirmation of the lesions. The periprocedural results were optimal resulting in the treatment of the lesion and lack of stenosis. The long term outcomes of the procedure were monitored using ultrasound.

**Results:** Supera stents provide advantages like: a higher degree of comfort for the patient and shorter hospitalisation, in comparison with the surgical treatment which is invasive, implies a longer hospital stay and an increased risk of complications. However, the price of the Supera stents exceeds the surgery costs.

**Conclusions:** Supera Peripheral Stents proved to be feasible, safe and even superior tools than surgery in the treatment of femoropopliteal lesions.

## **Total Arterial Revascularization Coronary Artery Bypass Surgery in patients with atrial fibrillation**

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**Presenting author:** Karolina Czarnecka

**Tutor:** MD Mariusz Kowalewski

**Introduction:** According to international guidelines on coronary artery bypass grafting (CABG), supplying left anterior descending (LAD) coronary artery with left internal mammary artery (LIMA) remains a golden standard for treating single-vessel coronary artery disease (CAD). Despite the lack of recommendation regarding the choice of further conduits in the treatment of multi-vessel CAD, arterial grafts became immeasurably more often chosen by the surgeons. As a result, the concept of total arterial revascularization (TAR) became widely spread. Given the superior long-term patency of arterial conduits, lower rates of myocardial infarction and repeat revascularizations TAR may also translate to improved long-term survival, as compared to traditional saphenous vein grafts (SVG). One of the most common comorbidities among patients referred for CABG is atrial fibrillation (AF). Many studies showed that AF is an independent risk factor for increased post-CABG mortality, however, little is known about how conduit selection influences survival in this population.

**Aim of the study:** Our aim was to assess whether total arterial revascularization is associated with improved long-term survival of patients with AF undergoing CABG.

**Method:** We conducted a registry analysis using data from the Polish National Registry of Cardiac Surgery Procedures (KROK). Between 2000 and 2019, 191,429 patients underwent isolated CABG, of which, 7,912 (4.13%) presented with pre-operative AF. Among patients who achieved complete revascularization, we identified cases of TAR and used propensity score matching to determine non-TAR controls.

**Results:** Median follow-up was 4.1 years ([IQR 1.9-6.8], max. 15.1). Propensity Matching resulted in 295 pairs of TAR vs non-TAR. Number of distal anastomoses was  $2.5 \pm 0.6$  vs  $2.5 \pm 0.6$  ( $P=0.938$ ) for TAR and non-TAR. Operative and 30-day mortality were no different between TAR and non-TAR patients (Hazard Ratio [HR] and 95% Confidence Intervals [CIs]: 0.17 (0.02-1.38)  $P=0.123$  and 0.74 [0.40-1.35]  $P=0.327$ ), respectively. On contrary, TAR was associated with a nearly 30% improved late survival: HR 0.72 [0.55-0.93]  $P=0.013$ . This benefit was sustained in subgroup analyses, yet most appraised in low-risk patients (<70 y.o.; EuroSCORE II <2; no diabetes) and when off-pump CABG was performed. It was also found that use of LIMA for LAD in TAR group was associated with superior survival as compared to use of vein for LAD revascularization: HR 0.33 [0.20-0.53],  $P<0.001$  for long-term mortality.

**Conclusions:** Total arterial revascularization in patients with pre-operative AF is safe and is associated with improved long-term survival. Particular survival benefit was observed in younger patients with an off-pump surgery. Moreover, LIMA to LAD is associated with an overwhelmingly superior long-term survival as compared to SVG to LAD, that reinforces the importance of TAR and underscores the importance of LIMA to LAD, especially in AF patients.

## **Temporal trends in ECMO use, patient profiles and hospital outcome in refractory post-cardiotomy shock.**

Ewa Olek, Michał Pasiński

Medical University of Warsaw

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**Tutor:** MD Mariusz Kowalewski

**Introduction:** Post-cardiotomy cardiogenic shock remains a significant therapeutic challenge. In cases refractory to pharmacological and mechanical support, extracorporeal circulation is the only possibility. Over the last years significant progress was made in ECMO therapy, regarding place of cannulation, timing and ECMO management. At the same time spectrum of patients qualified for extracorporeal support has widened to include older patients with higher comorbidity burden.

**Aim of the study:** The goal of present study was to assess temporal changes in survival with ECMO for PCS using ELSO registry.

**Method:** We retrospectively analyzed data from January 1st 1995 to December 31, 2018. All patients older than 18 years old with a diagnosis of PCS and treated with V-A ECMO were included. We excluded patients who had ECMO implanted prior to surgery as well subsequent ECMO runs in patients undergoing more than one ECMO run. Cases were divided according to year of implantation (pre- or post-2010). A 1:3 propensity matching was used to create a population of patients with similar baseline characteristics.

**Results:** During the study period, 8,053 patients received V-A ECMO for PCS; of those 7,185 (89.2%) have been treated after 2010. A significant increase in the number of ECMO for PCS was observed (coef.: 0.009;  $p < 0.001$ ), while mortality rate did not change significantly over time (coef.: -8.775;  $p = 0.682$ ). Also, a significant trend towards increasing age was observed (coef.: 0.444;  $p < 0.001$ ). A 1:3 propensity matching identified 1604 patients (401 in pre-2010 group and 1203 in post-2010 group) with similar pre-ECMO characteristics. Accessed endpoints were ECMO weaning and hospital outcome. Patients treated before 2010 less often could be weaned from ECMO (Odds Ratio; 1.41 Confidence Intervals; 1.01-1.61) and had a worse hospital survival (OR; 1.28 Cis; 1.12-1.79). Sensitivity analysis revealed a particular survival benefit of implantation post-2010 in patients with chronic kidney disease and in those who experienced cardiac arrest before ECMO implantation.

**Conclusions:** ECMO use in PCS increased significantly over years with a decrease in major complications associated with the procedure. The most important finding is that the patients treated with ECMO after 2010 present significantly better survival despite increasing average age and comorbidity burden. Our results strengthen the choice of ECMO in PCS. Further research in ECMO management is essential as it could lead to improved hospital survival.

## Effect of branched Endovascular aortic repair on platelet reactivity in patients with thoraco-abdominal aortic aneurysm

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**Introduction:** Endovascular aortic repair (EVAR) is a modern treatment option in both elective and emergency aortic aneurysm. It is an alternative method to open surgical repair that is nowadays becoming the gold standard of treatment of abdominal aneurysm. However, the presence of the graft implemented during EVAR may be associated with an increased risk of thrombosis, whereas double antiplatelet therapy (aspirin and clopidogrel) after the operation may increase the risk of bleeding.

**Aim of the study:** The aim of the study was to assess the effect of branched EVAR on platelet reactivity in patients with thoraco-abdominal aortic aneurysm.

**Materials and methods:** The study population comprised of 50 patients undergoing elective or emergency branched EVAR (Zenith t-Branch<sup>®</sup>) of thoraco-abdominal aortic aneurysm (mean age 70.9±5.7 years, 66% male). Patients who required oral anticoagulation, with end-stage renal disease or severe liver dysfunction were excluded from the study. Blood samples were collected 3 times: before the operation, within 24 hours after the operation and at hospital discharge. Platelet reactivity was assessed using impedance aggregometry (Multiplate<sup>®</sup> Analyzer) with arachidonic acid (ASPI test), adenosine diphosphate (ADP test) and thrombin receptor activating peptide (TRAP test) as agonists. Clinical data regarding thrombotic and bleeding events were extracted from the hospital database.

**Results:** There was a stepwise decrease in platelet reactivity after the operation, compared to baseline ( $p < 0.04$ ) in response to all agonists. There were no thrombotic events until discharge. After the operation, 23 patients required major red blood cell (RBC) concentrate transfusion ( $\geq 2$  units). At admission, there was a negative correlation between platelets reactivity and the amount of RBC units transfused after the operation ( $r < -0.32$ ,  $p = 0.03$  for ASPI test and  $r < -0.35$ ,  $p = 0.02$  for ADP test). The only factor that was able to differentiate between patients who did and did not require major RBC transfusion was pre-operative platelet reactivity measured by ASPI test - it allowed to predict bleeding with 78% sensitivity and 59% specificity at a cut-off over 30 AUC units.

**Conclusions:** Platelet reactivity decreases after branched EVAR of thoraco-abdominal aortic aneurysm. The pre-operative platelet reactivity measured with ASPI test at a cut-off  $> 30$  AUC units is an independent and strong predictor of post-operative bleeding requiring transfusion of  $\geq 2$  RBC units - it increases the odds of bleeding tenfold.

## Complete revascularization in coronary-artery bypass grafting and atrial fibrillation

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**Introduction:** Randomized controlled studies have repeatedly shown the benefit of complete - as compared to incomplete revascularization for multivessel coronary artery disease (MV-CAD), as it will result in the reduction of repeat revascularization, myocardial infarction (MI), or death. Atrial fibrillation (AF), described as an independent predictor of mortality and morbidity during CABG, is present in about 8% of patients undergoing CABG for MV-CAD further adding to baseline procedural risk.

**Aim of the study:** Whether there exists any benefit from CR in MV-CAD with underlying AF and, particularly, in the long-term, has never been addressed in a single study.

**Methods:** We retrospectively collected data from Polish National Registry of Cardiac Surgery Procedures (KROK). 5,738 patients with MV-CAD and AF (77.9% men, mean age 69.0±8.0) undergoing isolated CABG surgery between 2006-2019 in 37 reference centres across Poland included in the registry were analysed. We divided patients into complete- and non-complete revascularization groups and used propensity score (PS) matching to create pairs with similar baseline profile. Primary endpoint was long-term survival.

**Results:** Median follow-up was 5 years ([IQR 1.9-7.6], max.13). PS matching included 380 pairs divided into CR and non-CR groups. Subjects were no different in terms of baseline risk and surgical characteristics. Cardiopulmonary bypass (CPB) and aortic X-clamp times were significantly longer in CR group (median 79 vs 65 minutes and 40 vs 34 minutes respectively,  $p < 0.05$  for both). In-hospital outcomes and mortality risk at 1-year (Hazard Ratio [HR], 95% Confidence Intervals [CIs]: 1.38 [0.91-2.08];  $P = 0.129$ ) were unchanged with CR. Conversely, in a long-term analysis CR was associated with 40% improved survival: HR 0.59; (95%CIs: 0.46-0.76);  $P < 0.001$ .

**Conclusions:** Complete revascularization in patients with MV-CAD and pre-operative AF is safe, despite longer CPB and aortic X-clamp times. Although no significant differences in in-hospital and 1-year mortality between CR and non-CR groups were found, in a long-term follow-up in a propensity matched cohort, complete revascularization was associated with significantly improved survival.

## Long-term outcome evaluation in patient undergoing deep hypothermic circulatory arrest in aortic arch surgery

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**Introduction:** Aortic dissection usually is associated with low survival rates because of high prehospital and intraoperative mortality with great postoperative complication risk. Since 1985 deep hypothermic circulatory arrest (DHCA) is often used in this type of surgeries. Its main advantage is to provide bloodless surgical field while protecting brain tissue with hypothermia. Nevertheless, it still raises concerns of increasing neurologic sequelae and probable decrease of long-term quality of life.

**Aim of study:** To study and evaluate the possible effect of DHCA used in aortic surgery on patients' long-term quality of life in a retrospective cross-sectional study.

**Materials and methods:** From January 2019 to December 2020 24 patients had undergone aortic surgery requiring DHCA, 7 of those were excluded because of intrahospital death. For the rest of the patients Quality of life was evaluated using RAND SF36 questionnaire and MMSE test. Data regarding demographics, clinical characteristics, operation type, duration of circulatory arrest, Rectal and bladder temperatures were collected and analysed with IBM SPSS, a P value of less than 0.05 was considered significant.

**Results:** Of the 17 patients included in the study, 12 (71%) were men and 5 (29%) were women. Their mean age 60,71±13,8 years. Leading co-morbidity was PAH (64.7%). There were 6 (35.3%) elective and 11 (64,7%) emergency cases. Mostly there was Stanford A dissection (82.4%). 94.7% had aortic arch replacement. Most common postoperative complication was infection-29.4%.

The mean cardiopulmonary bypass time, aortal obstruction and reperfusion time was 212±38,3, 124±33.8 and 70,2±32,9 minutes, respectively. Core temperature during DHCA was 23,2±3,2. Rewarming rate was 0,12±0,07 C/min. No statistically significance between QOL and lowest DHCA temperature (p 0.059), Ao (p 0,544), reperfusion time(p0,618), CPB time (p 0.305) was observed. QOL and rewarming rate showed statistical significance (p 0,02). Mean long term quality of life was 71.9±10.2% and mean cognitive result was 27.9±5,3.

**Conclusions:** There was no statistical significance between lower quality of life and average temperature, Ao, CPB DHCA duration(p>0.05). Only rewarming time was found to be correlating with QOL. Compared to other studies QOL was the same or higher but compared to general population QOL is slightly decreased.

## **CASE STUDY: INTERNAL MEDICINE 1**

COORDINATOR Łukasz Pawłowski Małgorzata Podstawka

Jury:

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## **Dermatitis artefacta - lack of effective communication between health - care providers**

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**Tutor:** Prof. Anna Zalewska – Janowska Prof. Dominik Strzelecki

**Introduction:** Dermatitis artefacta is a condition in which skin lesions are caused by patient's own actions using different equipment such as sharp objects or chemicals. Therapy is often unsuccessful because effective treatment requires effective communication between specialists and full compliance of the patient, which are often missing.

**Case report:** In 2002, a 53-year-old male was admitted to the Department of Dermatology and diagnosed with acne excoriée. No psychiatric treatment was introduced and the patient was lost to follow-up. In 2010, he was again hospitalized at the Department of Dermatology. He was prescribed occlusive dressings and venlafaxine (first psychiatric consultation) for one year. Subsequently, next psychiatric consultation was held in 2011. Anxiety and depression were diagnosed and venlafaxine was maintained. The patient was referred to the Primary Health Care for follow-up with suggestion of periodic psychiatric and dermatologic consultations. The miscommunication between specialists led to the situation when the patient stopped effective treatment. During several years he tried "doctors shopping" and many different methods, such as gamma-globulin, autovaccine against Staphylococci, phagotherapy, hyperbaric oxygen therapy, acupressure, ozone therapy and various nonconventional techniques. Different doctors suspected serious systemic diseases. The patient was also treated by plastic surgeon. No psychiatric treatment was re-introduced till 2019, when the patient was consulted at the Psychodermatology Department. The consulting psychiatrist introduced duloxetine and the dermatologist - dermatological occlusive dressings. The patient's condition is much better and he is under interdisciplinary dermatological and psychiatric follow-up.

**Conclusions:** As for dermatitis artefacta patients, effective treatment requires effective communication between different specialists – general practitioner, dermatologist and psychiatrist. Of importance, proper diagnosis and subsequently appropriate therapy prevent not only prolonged suffering, but also the excessive costs to the health care system.



## **Tattoo-associated complications: Granulomatosis with polyangiitis**

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**Introduction:** Granulomatosis with polyangiitis (GPA) (previously referred to as Wegener's granulomatosis) is an antineutrophil cytoplasmic antibody (ANCA)-associated necrotizing vasculitis, one of the ANCA-associated vasculitides (AAV). GPA covers the upper and lower respiratory tracts and kidneys, affecting mainly small and medium-sized blood vessels. Limited data on immunocompromised districts (ICD) impact on Granulomatosis with polyangiitis development has been reported.

**Case Report:** We present a case of a 19-year-old male patient with numerous symptoms of GPA including the most common: upper and lower respiratory tract or renal manifestations and rare cardiac symptoms at the disease onset. Erythema and joint swelling present on admission. Potential connection with recent tattooing has been speculated. Remission has been achieved with cyclophosphamide and rituximab pulse therapy. Maintenance therapy includes azathioprine, methotrexate and methylprednisolone. Treatment supplemented with intravenous immunoglobulin infusions, plasmapheresis, and packed red cells transfusion. No Report Of Flare Up Over The 26-Month Follow-Up Period. Patient Under Constant Medical Supervision.

**Conclusions:** Although the exact cause of the disease has yet to be identified, links between environmental factors and the disease development are suspected. Thorough prior medical record analysis could be essential in prompt diagnosis and treatment of patients with multiorgan-spread GPA to prevent complications of vasculitis. Further research on ICD impact on GPA is to be conducted.

## **Dermatological matryoshka: Case report of Bacillary angiomatosis in the immunocompromised patient.**

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**Introduction:** Sometimes day- to-day medical practice seems to be more like a complex jigsaw to reveal a final diagnosis. We report a rare case of bacillary angiomatosis in an immunocompromised 80-year-old man with no history of previous exposure to cats, and atypical clinical features. Bacillary angiomatosis represents a cutaneous and systemic infection caused by *Bartonella* species (*Bartonella henselae* or *B. quintana*) and is prevalent in patients with an impaired immunological response.

**Case report:** 80-year-old man presented with diffuse features of disseminated, hemorrhagic nodules on his abdomen and nodular infiltration within the left ear, with no palpable lymphadenopathy or hepatosplenomegaly. Skin changes have been present for 3 months. Laboratory tests revealed antibodies to c-ANCA, proteinase 3 ++, myeloperoxidase, Quantiferon TB-Gold positive, increased CRP and D-Dimers. No anti-bartonella henseale IgM antibodies was detected. Ultrasound of the liver was discovered isoechogenic area in IV segment of dimensions 24×17 mm. Histological study of skin sample marked expression of CD4, CD8, Ki- 67 positive cells, moreover, the liver biopsy revealed an infiltration of cholangiocarcinoma. Treatment with Dapsone and Doxycycline was induced, with a clinical improvement. Based on the results of histopathology and clinical presentation, the diagnosis of Bacillary angiomatosis in correlation with neoplastic disease was made. Patient was transfer to further diagnostics at the hematology ward.

**Conclusion:** Clinical diagnosis of Bacillary angiomatosis marked the beginning of revealing reasons, why a patient developed an opportunistic infection. Histopathological results of aggressive cutaneous T-cell lymphoma and cholangiocarcinoma may predispose to *Bartonella* infection, as well as, skin lesion may be a form of para-neoplastic syndrome. Keeping in mind that, treatment with doxycycline, led to complete resolution of the skin lesions, Bacillary angiomatosis must be considered as a rare differential diagnosis of angiomatous lesions in the immunocompromised patient.

## The case of a patient with scleroderma-like syndrome due to travertine exposure

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**Tutor:** MD PhD Bogdan Kolarz

**Introduction:** Systemic sclerosis is a rare disease. It is characterized by progressive skin fibrosis that begins its development in the distal extremities and extends proximally into a generalized form.

Although the etiology of scleroderma is still unknown, there have been increasing reports of recently discovered work-related or drug-induced environmental factors. The scleroderma-like syndrome has been reported in patients exposed to organic solvents and epoxy resins. The correlation between these factors and the autoimmune response is not entirely clear.

**Case report:** A 58-year-old female was admitted to the Rheumatology Clinic in November 2019 in order to perform further assessment of systemic connective tissue disease. In 2017, the patient was treated at the Allergology Clinic for skin lesions accompanied by severe itching and erythematous-edematous lesions on the skin: swelling of the lips, eyelids, and changes on the limbs. She reported hardening of the skin of the trunk, forearms, lower legs, periodically recurrent joint pain and swelling of the fingers since January 2019. She denied contact with any allergenic factors prior to symptoms' onset. Physical examination revealed shiny hardening of the skin of both hands proximally to the metacarpophalangeal joints with reddening and hardening of the skin on the trunk and lower legs, in the absence of Reynaud's sign, and no ulcerations on the fingertips. Due to the ambiguous picture of described changes, which suggested systemic scleroderma (EULAR-9 points) - a skin sample was taken from the left leg for histopathological evaluation. On the last day of the patient's presence in the Clinic, she reported that the lesions in described skin areas developed after she moved to a new home, where a large area was covered with travertine preserved with organic resin. She also admitted that since the beginning of hospitalization (18 days) she noticed a significant improvement of her condition - skin hardening decreased and redness disappeared completely which lasted for several months. In the face of newly discovered facts a suspicion of scleroderma-like syndrome was raised due to allergies. Antihistamine and antihypertensive drug were added to treatment. The patient was discharged in good general condition for outpatient treatment.

**Conclusions:** The patient developed scleroderma-like syndrome after exposure to substances (probably epoxy resins) within travertine. After longer hospitalization, in the absence of contact with the triggering factor, our patient felt better, her general condition improved. The degree of hardening of the skin decreased and the patient's well-being improved significantly. Due to the ambiguous picture of symptoms it is important to carry out a proper differential diagnosis between systemic sclerosis and scleroderma-like conditions to avoid misdiagnosis and inappropriate treatment. Keywords: scleroderma-like syndrome, organic solvents, epoxy resins.

## **Venous thrombosis as a distant complication of severe diabetic ketoacidosis: a case report**

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**Tutor:** MD PhD Aleksandra Uruska

**Introduction:** Type 1 diabetes mellitus (T1DM) is a chronic disease characterized by an insulin deficiency resulting from the destruction of pancreatic  $\beta$  cells. The most dangerous complications of T1DM include ketoacidosis and severe hypoglycemia. We report an adult patient who developed medial gastrocnemius vein thrombosis as a distant complication of diabetic ketoacidosis (DKA).

**Case Report:** 28-year-old woman was admitted to the Clinic of Internal Medicine and Diabetology due to metabolic uncontrolled diabetes with hypoglycemic episodes. The patient had a 22-year history of T1DM and was treated with intensive functional insulin therapy at the moment of admission. Medical history also revealed android obesity, mixed hyperlipidemia, eating disorder, and borderline personality disorder.

One month before the patient had been hospitalized due to severe DKA complicated with severe respiratory insufficiency and acute renal insufficiency. Since the hospitalization, the patient has developed pain in the right lower leg and right foot. Physical examination demonstrated soreness, slight edema, and reduced temperature at the right lower leg and right foot. Pulse in the dorsalis pedis artery and the posterior tibial artery was palpable. Doppler ultrasound showed right medial gastrocnemius vein thrombosis. Diagnostic imaging was insignificant of any arterial circulatory disorders. The treatment included anticoagulants and compression therapy. The patient was discharged home in good health and followed up at the outpatient clinic.

**Conclusion:** Prophylaxis of venous thrombosis should be considered in every patient with severe DKA. Arterial thrombosis is a common complication of DKA but few reports present adult patients with venous thrombosis complicating DKA. The prevalence of venous thrombosis in adults who developed DKA is also poorly known, especially as a distant complication

## A 34-year-old female patient with an atypical course of diabetes mellitus

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**Tutor:** MD PhD Mariusz Dąbrowski

**Introduction:** Diabetes mellitus is a disease which is a cause of heterogeneous disturbances of metabolism, for which the main finding is chronic hyperglycemia. Nowadays it is diagnosed in millions of people all over the world. Diabetes mellitus type 1 is an autoimmune disorder resulting from the autoimmune destruction of insulin-producing beta cells in the pancreas. Mainly it affects children and young people (<30 years of age). However, the research studies show that the number of people over 30 years old, who develop diabetes type 1, is systematically increasing. Diabetes type 2 is caused by insufficient insulin production by pancreatic beta-cells with simultaneous insulin resistance and is associated with an unhealthy lifestyle and genetic factors. It is also known that women diagnosed with gestational diabetes have a higher risk of developing type 2 diabetes than those who have had normoglycemia during pregnancy. The aim of this study is to present the diagnostic process in a 34-year-old diabetic patient.

**Case Report :** A 34-year-old patient reported to the diabetes clinic due to high fasting glucose which had lasted for several weeks. Patient's medical history includes Hashimoto's disease, 5 pregnancies, which 3 of them failed. In the course of the last pregnancy, gestational diabetes was diagnosed, which was treated with metformin in the United Kingdom. However the delivery childbirth ended successfully. Family history of diabetes is negative. The patient's body weight at that time was 72 kg and BMI 23,5 kg/m<sup>2</sup>. Laboratory tests revealed C-peptide below normal range, no anti-GAD and anti-IA2 antibodies. Based on the tests' results and the OGTT test, diabetes type 2 was established. Therapy with DPP-4 inhibitor and metformin was introduced. The patient followed a restrictive diet and was physically active. However, after 4 months, self-controlled fasting blood glucose increased sharply due to stress. The patient noticed a further decrease in body weight by 9 kg in 3 months. Due to the clinical course, the diagnosis was changed to type 1 diabetes. Oral medications were discontinued and insulin therapy was applied. Improved blood glucose levels and stabilisation of body weight were achieved.

**Conclusion:** Clinical observation and proper diagnostics, individually tailored to the patient, are essential for the right treatment at the right time. The example of this patient shows that in young adults > 30 years of age, with newly diagnosed diabetes, type 1 diabetes should always be considered in the diagnosis.

## Riedel's thyroiditis or anaplastic thyroid carcinoma – difficulties in differentiation and diagnosis

Marta Podlewska

**Presenting author:** Marta Podlewska

**Tutor:** MD PhD Magdalena Górska

**Introduction:** A hard, palpable mass located in the neck along with pain and dysphagia is supposed to have a cancerous process. It causes patient's concern and requires urgent diagnosis. It is important to differentiate carcinoma with disease proceeding with the same clinical manifestation – Riedel's thyroiditis.

**Case report:** A 67-year-old woman with nodular goiter regrowth was referred to the clinic because of suspected thyroid carcinoma. She underwent a strumectomy 11 years ago. The patient reports neck pain and dysphagia lasting 6 months. Due to the pain and elevated inflammatory markers, the patient has been treated with antibiotics without improvement. Physical examination revealed a hard, enlarged thyroid. Laboratory tests showed elevated CRP level. TSH, fT3, fT4 levels were within normal limits. Increased aTPO, aTG and IgG4 level were observed. Thyroid fine needle aspiration revealed presence of neutrophils and histiocytes, without neoplastic cells. No bacterial growth was found on the thyroid FNA material and blood culture. The ultrasound showed thyroid with heterogeneous, reduced echogenicity, reduced vascularization and irregular boundaries. The infiltrate covered large vessels of the neck. The trachea was compressed by a goiter. CT revealed a goiter reaching the upper mediastinum and infiltrating left common carotid artery. The esophagus was attached to the infiltrate from behind. Numerous cervical lymph nodes were present in the thyroid area. No fibrosis in the abdominal cavity was observed. Based on the clinical picture and results, a Riedel's thyroiditis was diagnosed. The patient didn't agree to surgery. Glucocorticosteroids were included in the treatment.

**Conclusions:** Riedel's thyroiditis is a rare entity, with characteristics that suggest association with systemic fibrosis and other disorders triggered by IgG4. Diagnosis can be challenging due to the unspecific symptoms that overlap with other disorders, like anaplastic thyroid carcinoma. As to the treatment, there are no general consensus. In case of tracheal compression, surgery is indicated. Despite the lack of causal treatment, steroids are still the mainstay of therapy, but other medications against fibrosclerosis can be considered. Key words: Riedel's thyroiditis, systemic fibrosis, thyroid carcinoma.

## Persistent secondary adrenal insufficiency in patient with history of lymphocytic adenohypophysitis

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**Introduction:** Lymphocytic hypophysitis (LYH) is a neuroendocrine disorder characterized by autoimmune inflammation of the pituitary gland with various degrees of pituitary dysfunction. It can heal with minimal sequela or progress to fibrosis and result in permanent hypopituitarism. In one of the types of LYH, lymphocytic adenohypophysitis (LAH), an early destruction of the ACTH-producing cells is characteristic which could lead to development of long-lasting secondary adrenal insufficiency. Adrenal insufficiency is a condition in which the adrenal glands do not produce adequate amounts of steroid hormones, primarily cortisol.

**Case Report:** A 30-year-old female patient with a history of chronic autoimmune thyroiditis, insulin resistance, hypercholesterolaemia and obesity was diagnosed a few years ago with secondary adrenal insufficiency due to the isolated corticotropin deficiency after a suspected LAH. She was admitted to the Department of Oncological Endocrinology and Nuclear Medicine for a cortisol stimulation test with synthetic corticotropin (Synacthen). Previously, patient was hospitalized several times in 2016 in different hospital in order to carry out diagnostics of her chronic fatigue, drowsiness and dizziness – there she was diagnosed with secondary adrenal insufficiency due to the reduced cortisol levels along with inadequately low ACTH levels. Additionally, a pineal gland cyst (size:12x6x7mm) was discovered and since then observed under supervision of Department of Neurosurgery. Since diagnosis patient used hydrocortisone in a dose of up to 20mg per day for about 3 years, however in 2019 she discontinued therapy due to uncontrolled weight gain and soon the initial symptoms returned, together with additional menstrual disorders and transient hyperprolactinaemia. On January 26, 2021 a test with 250µg of Synacthen administered by intramuscular injection was performed, in which a normal increase in cortisol concentrations was observed in the 30th and 60th minute of the test (cortisol concentration-21.38µg/dL and 24.8µg/dL respectively), which confirmed an adequate adrenal reserve. However, decreased levels of cortisol in the morning were observed twice with the accompanying lower concentration of ACTH (26.2pg/mL) - confirming the maintenance of the diagnosis of secondary adrenal insufficiency after almost 5 years since the suspected LAH. On the basis of laboratory tests performed during hospitalization, normal androgens levels were found and hyperprolactinemia was excluded.

**Conclusion:** After suffering from pituitary inflammation, the insufficiency of the corticotropic axis due to isolated ACTH deficiency may persist for many years. Adequate hydrocortisone substitution seems to be of key importance and it is important to ensure that the patient is informed about the need to use steroid cover for stressful situations, even after confirming the correct adrenal reserve. Also patients with conditions such as autoimmune thyroiditis are at increased risk for other autoimmune diseases, even as rare as LAH.

## **Diagnostic difficulties in the autoimmune polyglandular syndrome type-1**

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**Introduction:** Autoimmune polyglandular syndrome type-1 (APS-1) is a rare subtype of autoimmune polyendocrine syndrome, which occurs in 1 to 290 000 Polish patients. This disorder manifests itself in dysfunction of endocrine and non-endocrine glands. Its diagnosis criteria include the homozygous mutation of autoimmune regulator (AIRE) finding or by clinical manifestation of two out of three symptoms: hypoparathyroidism, Addison's disease and chronic mucocutaneous candidiasis (CMC). Patients with APS-1 are prone to many other diseases such as: autoimmune hepatitis, diabetes, hypothyroidism, hypergonadotropic hypogonadism or asplenia. Those additional conditions may occur prior to the classical symptoms triad which makes diagnosis of APS-1 extremely challenging.

**Case report:** A 68-year old female was admitted to the clinic due to severe abdominal pain and high inflammation markers. She had been a patient of the Endocrinology Clinic before due to APS-1 which manifested in Addison disease – diagnosed at the age of 18, hypoparathyroidism – diagnosed at the age of 30 and CMC - diagnosed at the age of 68. The patient's past medical history included: hypothyroidism, Latent Autoimmune Diabetes in the Adults, pituitary macroadenoma, rheumatoid arthritis and many more. Abdominal ultrasound imaging showed asplenia, kidney stones and peritoneal fluid. Computed tomography of the chest and upper abdomen revealed the Morgagni hernia, pleural effusion and inflammation of both kidneys. Gastroscopy displayed the white raid characteristic of esophageal candidiasis, erosions of stomach membrane and stomach polyp. There were no other relevant findings. The patient's laboratory tests showed carbohydrates-metabolism disorders, low concentration of cortisol as well as high lipase which might be the cause of the abdominal pain. Her hormones were normalized and her condition was stabilised.

**Conclusion:** Patients with APS-1 are highly problematic when it comes to the diagnosis as the abundance of comorbidities can be misleading. The early evaluation of that syndrome is essential due to its life-threatening complications such as adrenal crisis, which can be quickly managed with the adequate treatment.



## **An unexpected case of Pradaxa-induced rhabdomyolysis**

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**Introduction:** Rhabdomyolysis is characterized by rapid skeletal muscle breakdown with direct release of muscle components into the bloodstream, that may eventually lead to acute kidney failure. The condition is usually manifested by myalgia, limb weakness, swelling and pigmenturia, but it may also remain asymptomatic. Rhabdomyolysis can be induced by numerous factors, including direct trauma, muscle ischemia, exertion, prolonged immobilization, infections, and exposure to high temperature, toxins or specific drugs, mainly statins. However, little is known about the impact of novel oral anticoagulants (NOAC), like dabigatran (Pradaxa), on the rhabdomyolysis occurrence.

**Case report:** A 53-year old male patient was admitted to the Department of Neurosurgery due to disc disease at L3/L4, left-sided femoral neuropathy and right lower extremity paresthesia. He had presented the symptoms for over a dozen years, and they had worsened within the past 2 months with no response to conservative treatment. Patient had history of type II diabetes, hypertension, episode of pulmonary embolism and urolithiasis. As the MRI and clinical examination have confirmed the diagnosis of L3/L4 discopathy, the patient was qualified for L3/L4 fenestration and foraminotomy with insertion of the interspinous dynamic stabilization (In-Swing). A day after procedure, the patient manifested severe hyperglycemia (498 mg/dL, HbA1c 14%), that was effectively normalized with an intensive insulin therapy. On day 4 post-surgery, due to persisting sensory disturbances in the feet, neurological examination and EMG test were conducted, and they revealed mixed axonal and demyelinating polyneuropathy (thioctic acid was prescribed). Notwithstanding this, the recovery period was generally uncomplicated and the patient was discharged from hospital after 9 days. At the 2-month follow-up, the patient presented pain, numbness and weakness of the left thigh, complicated with left quadriceps femoris atrophy. Additional neurologic drugs and rehabilitation were prescribed with negligible effect. EMG test was performed once again with similar results. Laboratory testing for Lyme disease was negative, and MRI examination did not reveal any significant changes in the spine. The patient was urgently admitted to the Department of Neurology for the extended diagnostics. Finally, it has been found that the presented condition could have resulted from dabigatran-induced muscle damage, as the symptoms have fully subsided after drug withdrawal.

**Conclusion:** To the best of our knowledge, this is the first reported case of a Pradaxa-induced rhabdomyolysis. Although this is not an officially confirmed side effect of the drug, such possibility cannot be excluded and particular attention should be paid to patients receiving dabigatran. Further research on this phenomenon should be conducted so as to improve the patients' security level. Possible interactions with other drugs should also be taken into account.

## Left atrial myxoma mimicking severe mitral valve stenosis: A case report

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**Introduction:** Primary cardiac tumors are rare and usually benign. Most of them are myxomas which tend to be located in the left atrium. Cardiac myxomas can remain asymptomatic for long periods of time. However, left atrium tumors may mimic symptoms of mitral valve stenosis.

**Case report:** A 37-year-old patient was admitted to hospital with the onset of severe dyspnea, productive cough, orthopnea, fever and general weakness. Physical examination revealed crackles in the right lower lung, blood pressure of 108/73 mmHg, heart rate of 120 bpm, 90% oxygen saturation on room air. Laboratory tests revealed increasing C-reactive protein levels (54,3 mg/l → 220 mg/l). A chest X - ray showed increased lung attenuation pattern, peribronchial cuffing and infiltrations of S3-6 segments. A two-dimensional echocardiographic examination revealed a mobile heterogeneous 5,8 x 4,7 cm mass in the left atrium arising from interatrial septum that significantly stenosed the mitral valve orifice during diastole (pressure half time (PHT) - 273 ms, mitral valve area of PHT - 0,81 cm<sup>2</sup>, mean gradient – 9,4 mmHg). Bronchopneumonia and pulmonary edema were diagnosed. Pulmonary edema was a result of mitral valve stenosis caused by left atrium myxoma. Conservative treatment with antibacterial medication and diuretics was administered. Three weeks later, with a reduction in inflammatory parameters, the patient underwent resection of the mass under cardioplegia and cardiopulmonary bypass. Diagnosis of cardiac myxoma was confirmed histologically. The postoperative course of the patient was uneventful. Treatment with antibacterial medication, diuretics and beta blockers was continued in combination with physiotherapy.

**Conclusions:** The main cause of mitral valve stenosis is rheumatic fever. However, cardiac tumors, especially left atrium tumors, can mimic symptoms of mitral valve stenosis. Noninvasive cardiac imaging remains the main method for differential diagnosis with echocardiography being the most commonly used. Treatment of myxomas is surgical and has a great long-term prognosis.

## Infective endocarditis of the mitral valve after COVID-19 infection

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**Introduction:** Infective endocarditis (IE) is defined as an infection of the endocardial surfaces of the heart. If left untreated, IE is inevitably fatal. We present a case of mitral valve infective endocarditis in a patient previously diagnosed with COVID-19.

**Case report:** A 46-year-old male patient was hospitalized at the Department of Clinical Immunology and Rheumatology due to intermittent fever (up to 39, 5°C), high inflammatory parameters (CRP>300), thoracoabdominal herpetic skin efflorescences, and an intermittent skin rash. The patient had already been hospitalized and treated two months prior because of COVID-19 caused bilateral pneumonia. During the current hospitalization, under the presumption of sepsis, the patient received antibiotic therapy (ceftriaxone and linezolid) and oral acyclovir for herpes zoster skin lesions. The patient developed palpable purpura on his extremities. Janeway lesions could be seen on his palms and Osler's nodes on his fingertips. Initially, the patient did not have any heart murmurs, but soon after the lesions and nodes appeared, a systolic murmur (2-3/6) could be heard. The murmur did not coincide with other typical IE symptoms, such as shortness of breath or precordial pain. However, blood culture results came back positive for *Staphylococcus aureus* and *epidermidis*. Although no significant pathology could be seen on the transthoracic echocardiogram, the transesophageal echocardiogram showed a large endocarditic vegetation on the posterior cusp of the mitral valve alongside a significant mitral insufficiency. Soon after, the patient underwent mechanical mitral valve replacement and is now stable.

**Conclusion:** The correct diagnosis could have been easily missed as the patient didn't present many typical signs or symptoms of infective endocarditis. The evidence on COVID-19 causing IE is pretty sparse, however vegetation development begins through transient bacteremia and is followed by the binding of bacteria to damaged endothelium. This could perhaps explain how SARS-CoV-2 and the systemic inflammation caused by it could be a potential risk factor for IE. Although it is still unknown whether COVID-19 is a legitimate risk factor for infective endocarditis, practitioners should be aware of this potential complication as it can be easily missed because of lack of symptoms. Hopefully, future studies will show definitive answers because if left untreated, infective endocarditis is a fatal disease.

## SEVEN ISCHEMIC STROKES UNTIL THE DIAGNOSIS OF ANTIPHOSPHOLIPID ANTIBODY SYNDROME

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**Introduction:** Antiphospholipid antibody syndrome (APS) is an autoimmune condition characterized by venous or arterial thrombosis and/or pregnancy morbidity. For diagnosis at least one of the three antibody types must be evident in plasma or serum: anticardiolipin antibodies, lupus anticoagulants, anti- $\beta$ 2-glycoprotein-I antibodies. Stroke is the most frequent neurological manifestation of APS.

**Case report:** 53-year-old male was admitted with a preliminary diagnosis of transient ischemic attack (TIA). Patient is complaining of general fatigue and impaired balance and gait for more than 4,5 hours. Examination reveals gaze palsy and tongue deviation to the left side, deep hemiparesis, and sensation impairment on the left side of the body and Babinski reflex in the left foot. Native CT, MR and MRA of the brain reveal acute ischemic changes in the right middle cerebral artery territory as well as multiple old ischemic lesions in the right frontal, parietal and occipital lobes as well as left parietal lobe. In the past 13 years patient has been hospitalized with TIAs 6 times. Symptoms of each of those TIAs coincide with old ischemic lesions seen on CT and MR, suggesting that each of them was a stroke. Other investigations, including native CT and echocardiography reveal diffuse changes in lungs, left ventricle diastolic dysfunction, mitral and aortic valve regurgitation. In suspicion of systemic disease, laboratory tests for APS are done, where Anti-Cardiolipin IgA, IgM, IgG come back positive. **SUMMARY.** This case report demonstrates a young man with undiagnosed symptomatic APS, resulting in multiple strokes, misdiagnosed as TIAs. Early diagnosis of APS and prophylactic treatment is crucial to prevent recurrent thrombosis.

**Conclusions:** In the case of symptomatic APS, early diagnosis is crucial to exclude recurrent thrombosis by implicating secondary prevention, where the vitamin K antagonists are preferred over antiaggregant or direct oral anticoagulant treatment.

## **A patient with heart failure and spectacular results of medical treatment**

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**Introduction:** Heart failure (HF) is a condition resulting from inadequate cardiac output at existent metabolic requirements or from an effect to maintain normal output by elevated intracardiac pressures. For over two decades the treatment approach that includes angiotensin-converting enzyme inhibitors (ACEIs) have been administered in patients with left ventricular (LV) systolic dysfunction as it had shown to improve prognosis. However, in 2016 sacubitril/valsartan became recommended by the guidelines upon evidence of being superior to enalapril in HF with reduced LV ejection fraction (EF), yet it is still underused in some populations due to relatively high cost and patient profile-specific aspects.

**Case report:** A 56-year-old male patient was admitted to the Cardiology Department due to decreased exercise tolerance and recurrent shortness of breath that had continued for over a month. His previous medical history included arterial hypertension, type II diabetes, and hypercholesterolemia. Baseline NT-proBNP level at hospital laboratory test was 13825 pg/ml. Echocardiography showed LV dilatation and severe systolic dysfunction with EF of 15%. No significant lesions were found on coronary angiography. The patient was receiving perindopril, and on top of that carvedilol and eplerenone were added. This intervention reduced NT-proBNP to 2589 pg/ml and slightly enhanced LVEF to 20%. Consequently, ACE inhibitor was replaced by sacubitril in combination with valsartan resulting in even further improvement of NT-proBNP to 1200 pg/ml and LVEF to 30%. However at 8 month follow-up NT-proBNP was 771 pg/ml, EF of 41% and no nsVT episodes were observed in Holter monitoring. This spectacular improvement denoted the disease profile regression from HF<sub>rEF</sub> to heart failure with mid-range ejection fraction (HR<sub>mrEF</sub>), and thus no ICD procedure remained applicable.

**Conclusion:** Guideline- recommended medical therapy may substantially improve patient's condition in functional and structural context of HF<sub>rEF</sub>, rearranging further strategy to an extent that even leaves out device-based options. Neprilysin inhibition represents a highly important target in view of treatment outcomes.

## **Infective endocarditis of the aortic, mitral and tricuspid valves complicated by retinal embolism of the left eye**

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**Introduction:** Infective endocarditis (IE) is a rare, life-threatening disease. It develops as a result of infection and attacks mainly valvular, ventricular and atrial endocardium or artificial materials in the heart. Most often, IE affects the aortic and mitral valve, less often the tricuspid valve and in ~ 10% > 1 valve, but IE of more than 2 valves are very rare, especially in patients without predisposing factors (septal defects/i.v. drug abusers). IE is preceded by bacteremia - from <2 weeks (in 80% of cases) to 2–5 months.

**Case Report:** We present the case of 52-year-old patient with 6 months history of weakness, loss of appetite, weight loss diagnosed with multi-valve infectious endocarditis of the etiology of *Staphylococcus hominis* ssp *hominis* methicillin-resistant and *Streptococcus gallolyticus* ssp *pasteurianus* complicated by a retinal embolus of the left eye. In anamnesis: paroxysmal atrial fibrillation, arterial hypertension, non-insulin dependent type 2 diabetes, chronic kidney disease, no history of i.v. drugs. Laboratory tests on admission revealed: increased parameters of inflammation and signs of exacerbation of chronic kidney disease. Transthoracic echocardiography (TTE) confirmed the image of massive vegetations on at least 3 heart valves (aortic, mitral, tricuspid) with probable perforation of the mitral and tricuspid valve leaflets with severe mitral and tricuspid regurgitation, moderate aortic and pulmonary regurgitation, suspected pulmonic valve IE, with left ventricle ejection fraction (LVEF) 50% and enlarged all heart cavities. Due to the patient's serious condition, TEE was withdrawn. The angio-CT excluded significant narrowing of coronary arteries. Dental consultation showed an advanced caries however the recommended oral cavity sanitation was not performed due to the severe general condition. The Heart Team disqualified the patient from surgery due to a very high operational risk (Euro Score II > 40%). The patient was treated according to the antibiogram with vancomycin and levofloxacin. Despite the complete treatment according to ESC guidelines, no improvement in clinical status was achieved. The patient died on the 7th day of hospitalization.

**Conclusion:** According to a lot of researches, the patient had a number of predictors of in-hospital mortality in IE: an elevated CRP level at hospital admission and high D-Dimer. Diabetic patients show a significantly lower survival. IE is one of the most important causes of increased mortality and morbidity among patients with chronic kidney disease. Untreated caries was the probable cause of IE. The patient was repeatedly unsatisfactorily diagnosed within the ED and hospital wards during the last six months. IE is lethal and difficult to diagnose. The patient probably did not have septal defects, but the long course of the disease and delayed diagnosis led to the spread of IE to many valves, which combined with multiple diseases or comorbidities, disqualified him from surgery or the basic method of treatment due to the extremely high risk.

## Various clinical scenarios leading to temporary success in dilated cardiomyopathy

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**Introduction:** Dilated cardiomyopathy is the most common form of cardiomyopathy among the group of primary myocardial diseases. The annual incidence of DCM is about 5-8 per 100,000. In this study we present three cases of exacerbation of heart failure due to dilated cardiomyopathy in whom treatment used (mainly levosimendan therapy and ICD implantation) led to temporary therapeutic success.

**Case report:** A 25-year-old patient with DCM (confirmed in MR in 2018) presented to the ER due to exercise-induced and nocturnal dyspnea with cough. UKG examination was performed and it indicated EF 20/25% and severe mitral and tricuspid valve regurgitation, which was also worse compared to 2018. The patient was treated with Entresto 24/26 and qualified for ICD implantation. A 35-year-old patient with a history of spontaneous hypertension and heart failure due to post-inflammatory cardiomyopathy was admitted to the department of cardiology due to another incident of heart failure decompensation with dyspnoea in NYHA IV class with features of impending cardiogenic shock. In the UKG, a thrombus was detected in LV. MR with contrast revealed chronic post-inflammatory severe LV dysfunction and pericardial effusion. During his stay in the hospital, the patient was implanted with an ICD. A 36-year-old patient with heart failure (confirmed in MR in 2018) with decreased LV systolic function due to polymyositis, who improved after treating with levosimendan during the last hospitalization, was admitted to the hospital because of exacerbation of NYHA III heart failure. During hospitalization the patient was treated with entresto, which improved her condition. 1,5 month later the patient's condition rapidly got worse. Despite the resuscitation and immediate qualification for ECMO, the patient died.

**Conclusion:** An individual approach to patients is important. An optimal treatment can improve their prognosis. The prognostic factors may be young age.

## Left ventricular support in myocardial infarction

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**Introduction:** The frequency of acute coronary syndromes in Polish population is still high. Percutaneous coronary intervention (PCI) is a standard of treatment in majority of patients with advanced coronary artery disease. In high-risk patients, including those with cardiogenic shock, severe heart failure or ventricular arrhythmias, different complex procedures can be applied. To improve the prognosis, mechanical circulatory support systems, e.g. extracorporeal membrane oxygenation (ECMO), can be used effectively. ECMO is highly specialized method, which ensures efficient organ perfusion during cardiac dysfunction. We report a case of ECMO usage in patient with cardiogenic shock and sudden cardiac arrest developing after acute myocardial infarction.

**Case report:** A 58-year-old male patient with a history of physical activity deterioration since 2 months was admitted to the hospital due to exacerbation of dyspnoea at rest and orthopnoea. In physical examination clinical signs of pulmonary congestion and peripheral oedema were present. ECG revealed atrial flutter and right bundle branch block. Laboratory tests showed increased levels of troponins, C-reactive protein, D-dimer and glucose. The patient's condition improved initially after intravenous administration of furosemide and nitroglycerine. The next day the clinical status deteriorated. Increased dyspnoea, tachypnoea and pulmonary congestion were presented. ECG revealed myocardial ischemia and complete atrioventricular block. The patient went into cardiogenic shock and afterwards sudden cardiac arrest occurred. Mechanical cardiopulmonary resuscitation was urgently performed with the use of LUCAS device and the wire for temporary cardiac pacing was inserted. Coronary angiography was proceeded, which revealed long critical stenosis of the left anterior descending artery (LAD). The patient was qualified to an arterio-venous ECMO system due to the drug-resistant cardiogenic shock and lack of spontaneous heart function. Then PCI of LAD with implantation of 3 drug-eluting stents was performed. The patient was transferred to Intensive Care Unit and when he was hemodynamically stable, moved to the Department of Heart Diseases. The rehabilitation was carried out with good result. The follow-up echocardiography showed generalized hypokinesis and reduced left ventricular ejection fraction. Pharmacological treatment was optimized. Finally, implantable cardioverter-defibrillator was implanted in secondary prevention of sudden cardiac arrest.

**Conclusions:** Arterio-venous ECMO treatment in patients with acute coronary syndromes complicated by cardiogenic shock and who undergo PCI is recognized as a modern invasive tool nowadays. ECMO supports not only hemodynamic circulation but also provides gas-exchange and works independent of heart activity. Such treatment requires several vascular accesses and qualified shock-team. Hence, access to ECMO is limited to highly specialized centers only but could be life-saving.



## **A 32-year-old woman with unexplained exertional dyspnea- the necessity of a multidisciplinary approach**

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**Introduction:** Exertional dyspnea (ED) is a common symptom with numerous possible underlying causes. In most patients the cause of ED is quite easily determined by interview and physical examination, however there are cases that pose a considerable diagnostic challenge for physicians.

**Case Report:** A 32-year-old woman presented to the cardiologist with a history of exercise intolerance and recent exacerbation of symptoms to severe ED. The patient denied chest pain, dyspnea at rest, edemas and other subjective symptoms. The initial suspicion of heart failure was considered unlikely after the physical examination and she was referred to the Department of Cardiology. On admission cardiorespiratory examination was unremarkable. There were no changes in routine laboratory tests,

NT-proBNP was 73 pg/ml, CRP was normal. Several tests for infectious diseases were done, all were negative. Transthoracic echocardiography showed an ejection fraction of 59%, slight left atrium enlargement, mild mitral valve regurgitation and normal systolic function. Transesophageal echocardiography excluded abnormal connections between cardiac chambers or large vessels.

Electrocardiography (ECG) showed normal sinus rhythm and no significant abnormalities. Holter ECG showed an average heart rate of 68 bpm and mild asymptomatic supra- and ventricular arrhythmia. Chest x-ray and abdominal computed tomography (CT) were normal. A cardiopulmonary exercise test (CPET) was performed (Bruce protocol). VO<sub>2</sub>peak was 1,49 l/min (75% norm); during the examination oxygen saturation decreased from 98 to 94%, patient became presyncopic. The stress test was inconclusive as patient reported stabbing chest pain and non-specific ECG changes were detected. The coronary CT angiography was therefore performed. It showed a calcium score of 0, which excluded coronary artery disease. During hospitalization, patient was consulted with several specialists.

Endocrinologists diagnosed insulin resistance, but excluded hormonal causes of ED. A hematologist was consulted due to toxic granulations discovered in granulocytes, however she excluded hematologic diseases. The geneticist stated that a monogenic disease is unlikely; he noted that patient has a positive family history only of type 2 diabetes. During a pulmonary consultation, the pulmonologist suggested a muscle biopsy, in search for myopathy. Unfortunately, the procedure has extremely low availability and patient has to wait 2 years for it. The working diagnosis of mitochondrial myopathy was made. A supplemental therapy of L-carnitine (5g/day) and riboflavin (200mg/day) was started on the basis of the literature data. After 2 months patient reported an improvement in exercise capacity.

**Conclusion:** Mitochondrial myopathies are rare progressive muscle conditions caused primarily by the impairment of oxidative phosphorylation in the mitochondria. Exercise intolerance is one of the most common symptoms. The multidisciplinary approach is essential in the diagnostic process.

## Pulmonary Atresia With Ventricular Septal Defect In A Young Patient

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**Introduction:** Pulmonary atresia with ventricular septal defect (PAVSD) is a congenital heart disease (CHD) associated with an increased risk of developing secondary pulmonary hypertension, due to atresia of the pulmonary arteries and valve, resulting in increased mean arterial pressure (MAP) in pulmonary arteries.

**Case report:** A 17-year-old woman with anamnesis of modified left-sided aortopulmonary anastomosis and a right-sided unifocalization procedure due to CHD and PAVSD was admitted to the tertiary hospital. The main complaints included exertional dyspnea and fatigue. On the examination, the saturation range was 78 – 82%, moderate cyanosis and finger clubbing were noted. Diagnostic angiography was performed revealing pulmonary hypertension (PH) with mean arterial pressure (MAP) 33 mmHg, aortopulmonary collateral stenosis 3 mm in diameter. Urgent stenting of aortopulmonary collateral was performed. The early postoperative period occurred without complications. The patient was discharged home after 5 days of in-hospital stay in a good overall health condition. 6 months later, the patient was hospitalized for planned additional treatment. The patient's main complaints included progressive exertional dyspnea. Moderate cyanosis, clubbing of the fingers was seen with a saturation of 82%. The hybrid operation, longitudinal sternotomy, and left pulmonary artery stenting were performed. During the early postoperative period in the intensive care unit (ICU), the patient became hemodynamically unstable, therefore re-operation with revision of the surgical site, right pleural cavity coagula-ectomy, pleural and pericardial cavity drainage was performed. 2 days after the re-operation, pleural effusion was detected. Pleural decompression with drain insertion was performed and antibacterial therapy was initiated. The patient was discharged in a good overall health condition after 21 days of in-hospital stay. 3 years later, an echocardiography was performed revealing congenital heart disease, dilatation of the right ventricle, ascending aorta, and the right atrium, as well as pulmonary atresia and ventricular septal defect.

**Conclusion:** Although PA-VSD is a rare congenital entity with poor prognostic outcomes, it is important to promptly diagnose and treat this condition. This case report marks the importance of interprofessional teamwork in evaluating and treating patients with congenital heart disease. Early surgical intervention reduces mortality resulting in a gradually positive long-term outcome for the patient. Further research is warranted to assess factors contributing to higher mortality among patients with CHD and PAVSD.

## Iatrogenic pulmonary embolism with cyanoacrylate - to remove, or to leave?

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**Introduction:** Iatrogenic pulmonary embolism (PE) with cyanoacrylate is an uncommon, yet potentially life-threatening condition. Hitherto, no consensus regarding management thereof has been established, creating a significant challenge in clinical practice.

**Case report:** A 46-year-old female with autoimmune hepatitis and liver cirrhosis presented with symptoms of upper gastrointestinal bleeding. Gastroduodenoscopy revealed active haemorrhage from a huge duodenal varix and an endoscopic injection sclerotherapy with cyanoacrylate was performed. Since the bleeding continued, the patient underwent a successful surgical ligation of the bleeding varix the following day. Twenty days later the patient was re-admitted due to dyspnoea, cough and pleuritic chest pain. On physical examination she was tachypnoeic and hypoxic. Computed tomography angiography (CTA) revealed the presence of disseminated, hyperdense deposits in segmental and subsegmental branches of both pulmonary arteries, confirming the suspicion of PE with cyanoacrylate. A perfusion single-photon-emission computed tomography scan revealed bilateral wedge-shaped perfusion defects matching several bronchopulmonary segments. Echocardiography showed no embolic material and no features of right ventricular pressure overload. The cardiac troponin I and natriuretic peptide concentrations were within normal range. The patient was consulted within the local Pulmonary Embolism Response Team (PERT) to facilitate immediate decision on most advantageous management. Given the hemodynamic stability, our patient was at low-risk of death. The danger of further thromboembolic and septic complications was also identified as unlikely. Consequently, the PERT members assessed the risk of interventional therapy to be higher than the risk of death. A decision was made to continue with the conservative therapy, close observation, a control CTA scan and repeated endoscopies with varices ligation. A favourable outcome during the 12-month follow-up period confirmed that the right path of management had been taken.

**Conclusion:** The nature of the PE with cyanoacrylate rules out any form of pharmacological therapy, including anticoagulation. The range of surgical treatment options is wide but choosing an optimal therapy for an individual patient is truly challenging. For our patient, the accurate management of the PE episode was crucial, since it could heavily determine her overall condition and potentially disqualify her from the liver transplantation. In our conservatively-managed patient, only a 12-month follow-up assured us of her recuperation. Hence, the treatment should always be based on the individualised risk stratification to determine whether interventional or conservative approach is more beneficial. Consultation in a multidisciplinary team of experts is an important part of a decision-making process to ensure the optimal clinical management

## Congenital fibrinogen disorders as a cause of pulmonary embolism - case report

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**Tutor:** Prof. Marlena Broncel, MD PhD Paulina Gorzelak-Pabiś

**Introduction:** Fibrinogen plays a key role in the process of coagulation. This glycoprotein is composed of three polypeptide chains - A $\alpha$  encoded by the FGA gene, B $\beta$  encoded by the FGB gene and  $\gamma$  encoded by the FGG gene. Two types of inherited fibrinogen disorder (IFD) are recognized, both of which are rare: Type I involves reduced quantities of fibrinogen (afibrinogenemia, hypofibrinogenemia), whilst type II involves qualitative abnormality (dysfibrinogenemia).

**Case Report:** This study presents a case of 44-year-old woman admitted to the Dept. of Infection Diseases, on account of nonspecific chest pain, exacerbating cough and hemoptysis. On physical examination she presented tachycardia, hypertension, saturation 95%, palpable enlargement thyroid gland, bilateral crepitations in lungs. Laboratory tests on admission showed a CRP 195 mg/L, TSH <0,01  $\mu$ U/ml, FT 4 47,5 pmol/ml, fibrinogen 48mg/dl (normal 200-470), thrombin time 25,6s (normal 11-17s) D-dimers -1743  $\mu$ g/L. Chest CT scan revealed consolidations in each lung typical for pneumonia. The antibiotic therapy and prophylactic dose of enoxaparin was administered. After 3 days the patient was transferred to the Dept. of Internal Diseases and Clinical Pharmacology for further diagnosis and therapy. Extended thyroid tests detected thyrotropin receptor antibodies (TRAb), hyperthyroidism was diagnosed and treated by Metizol. Due to persisting dyspnea, hemoptysis, weakness and tiredness the CT scan of pulmonary arteries was performed; it showed the massive embolic material in right pulmonary artery and its branches. Pharmacotherapy was modified, therapeutic doses of enoxaparin was added, due to the level of fibrinogen (46mg/dl) cryoprecipitate was administered. Additionally, thrombophilia and antiphospholipid syndrome screening was performed with negative results. During hospitalization, genetically determined disorders of fibrinogen were suspected, and material was taken for genetic testing. Patient in the good condition, was discharged from hospital on rivaroxaban therapy. After 6 weeks, based on genetic research (the pathologic allele in FGG gene) and low functional and antigenic fibrinogen level with a functional/antigenic ratio of 0.4 the diagnosis of hypodysfibrinogenemia has been made.

**Conclusion:** Hypodysfibrinogenemia is the most rarely reported congenital disorder of fibrinogen. The largest literature review published so far, reporting 51 patients diagnosed with this disorders. Thromboembolic events appears to be one of the common complications, reported in patients with hypodysfibrinogenemia.

## **Recovery from a severe Influenza A infection followed by COVID-19 with Pseudomonas Aeruginosa coinfection**

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**Tutor:** Prof. Ligita Jancoriene

**Introduction:** Novel coronavirus disease (COVID-19) is caused by a severe respiratory syndrome-coronavirus-2 (SARS-CoV-2). SARS-CoV-2 is similar to Influenza A due to its transmission and clinical presentation. Influenza A and SARS-CoV-2 both can cause a serious complication – pneumonia with lung damage, increasing the risk for a coinfection or a new following respiratory viral infection. COVID-19 has also been associated with bacterial coinfection, especially in critically ill patients, leading to a worse outcome. Therefore our goal is to discuss the possible treatment of complex cases, raise awareness and discuss the effect of coinfections.

**Case report:** A 59 year old male presented due to worsening COVID-19 symptoms, successfully resuscitated in an ambulance on the transfer, BP of 115/66 mmHg, HR of 59 times/minute and SpO<sub>2</sub> was 64%, body temperature was 32,6 °C. Patient had history of hypertension, heart failure, type 2 diabetes mellitus. 36 days prior he tested positive for Influenza A, which complicated to pneumonia. Invasive mechanical ventilation and later ECMO was performed. Multiple organ dysfunction was diagnosed, due to renal insufficiency hemodialysis was performed. He was then transferred to a supportive care hospital. It is not recorded when has the condition worsened, 2 days prior to arrival patient was tested positive for COVID-19. Patient was sedated and unconscious on arrival. Invasive mechanical ventilation was immediately performed. SpO<sub>2</sub> recovered within 5 minutes to 97%. Due to unstable hemodynamics noradrenaline infusion was administered in order to keep mean arterial pressure > 65 mmHg. Hydroxychloroquine and azithromycin therapy was commenced. Chest CT was performed the next day and showed diffuse ground-glass opacities in the periphery of both lungs. Invasive mechanical ventilation was continued for 21 days. Later only intranasal oxygen was administered at the rate of 3 liters per minute. 14 days after admission pseudomonas aeruginosa was detected in urine, therefore imipenem/cilastatin, tazocine and fluconazole were administered. 38 days after hospitalization the patient was discharged to a supportive care hospital.

**Conclusion:** Here we presented a case of severe COVID-19 pneumonia which has followed Influenza A pneumonia, although we currently have no evidence whether there has been a coinfection of both viruses. The patient was present with diabetes and hypertension along with other comorbidities. Invasive mechanical ventilation was commenced shortly after the admission due to low SpO<sub>2</sub> of 64% and already known patient's history, treatment with hydroxychloroquine and azithromycin have also been added. Pseudomonas aeruginosa urinary tract infection was later diagnosed, various studies suggest that this particular bacteria is more often detected in symptomatic COVID-19 patients than non-symptomatic. The isolation and proper care criteria after first severe infection with Influenza A were not met, as the worsening patient's state was not properly monitored

## COVID-19 on patients with tetralogy of fallot: case report

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**Introduction:** Tetralogy of fallot (TOF) is a rare congenital condition caused by a combination of four heart defects, but it can have some variations as well. The severity of the symptoms is related to the degree of blood flow obstruction from the right ventricle. The most common symptoms are poor weight gain, cyanosis, clubbing of fingers and toes, shortness of breath and rapid breathing, tiring easily during physical activities and fainting. Echocardiography, electrocardiogram, oxygen level measurement, chest X-ray, cardiac MRI and catheterization are essential to diagnose and evaluate TOF. The only effective treatment for TOF is surgery. This paper presents the case of COVID-19 infection in 28-year-old woman with TOF.

**Case report:** Coronavirus disease is a viral infection mostly manifested with fever, dry cough, tiredness, bone pain, etc. The woman with the dry cough and fever had been hospitalized with a confirmed COVID-19 infection in 2021-03-11. From a medical record it is known that the patient had severe pulmonary arterial hypertension due to congenital heart defect (TOF). Throughout the hospitalization she had always noted to be cyanotic, had an audible heart murmur and pulse oximetry had documented an oxygen saturation of 73-80% in room air. As known, COVID-19 can cause lung damage and breathing problems that can be treated with dexamethasone and remdesivir and thus reduces 28-day mortality or recovery time. All patients who require oxygen therapy and whose chest X-ray (or CT scan) shows signs of viral pneumonia are treated with dexamethasone at a dose of 6 mg daily for up to 10 days. If the duration of COVID-19 pneumonia does not exceed more than 10 days and the assessment of renal and hepatic function is good, in addition patients are treated with remdesivir for 5 days. Whereas infiltrative changes could not be detected on the chest X-ray of this patient because due to the pronounced congestion in the lungs and woman did not feel the need for oxygen during the entire hospitalization, treatment with dexamethasone and remdesivir was not indicated. Only symptomatic treatment was given to relieve dry cough and to reduce fever. 10 days after positive COVID test the patient was considered healthy and was released from an isolation in a health care facility.

**Conclusion:** This case indicates that the comorbidity of COVID-19 infection and TOF may bear on the diagnosis of COVID-19 pneumonia. Whereas a low oxygen saturation on pulse oximetry, a lung infiltration on chest X-ray determine a specific treatment with dexamethasone and remdesivir in patient with COVID-19 pneumonia, it is difficult to identify in patients with TOF because of a persistent low oxygen saturation and a lung congestion that interferes the assessment of infiltrative changes. Therefore, clinical symptoms, complaints and laboratory tests are important in TOF patients with COVID-19 infection to diagnose coronavirus pneumonia.

## **Ondine's Curse, why early diagnosis is crucial for survival - a case report of a female infant with congenital central hypoventilation syndrome**

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**Presenting author:** Patrycja Niewinna

**Tutor:** PhD Antoni Pyrkosz

**Introduction:** Is to describe case of very rare potentially lethal genetically disease. Ondine's Curse or Congenital Central Hypoventilation Syndrome (CCHS) is a very rare, potentially lethal, genetically determined disease. It is associated with dysfunction of the autonomic nervous system, the main symptom of which is hypoventilation, most often during sleep. This means the lifelong need of ventilation support in patients with CCHS. The reason is attributed to the mutation of the PHOX2B homeotic gene in the 4p12 locus. The genetic mutation leads to underdevelopment of the respiratory center in the brain. Patients with this syndrome may experience complete and abrupt stop in breathing when the affected individual is asleep. It is a rare cause of sleep apnea, caused by a malfunction in the autonomic control of breathing.

**Case report:** The case report concerns a female infant with confirmed CCHS based mainly on respiratory failure with oxygen dependence as early as the first hour of life, the appearance of apnea requiring stimulation during sleep, reduced sensitivity to hypercapnia, shallow and irregular breathing, periods of increased sweating, disturbances in thermoregulation, periodic disturbances swallowing, eating problems, slower pupil response to light, and genetic testing confirm the presence of an abnormal PHOX2B gene allele.

**Conclusions:** The presented symptoms and the results of additional tests met the criteria of CCHS syndrome. CCHS should be considered in the differential diagnosis of postnatal respiratory distress. Early identification of the disease and implementation of appropriate treatment increases the quality and length of life. One should also remember about substances (alcohol, drugs, e.g. tranquilizers, anesthetics) which may depress the respiratory system and cause death, especially in young adults and adolescents. CCHS patients require regular follow-up by a multidisciplinary team.

## Systemic lupus erythematosus with triple positive antiphospholipid antibodies and Raynaud syndrome

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**Presenting author:** Lorena Karla Rudez

**Tutor:** MD Ljiljana Smiljanić Tomičević

**Introduction:** Systemic lupus erythematosus (SLE) is a chronic autoimmune disease that can be presented with various symptoms. That is the reason why SLE can sometimes be misdiagnosed. We present a case of a young female patient who has not been diagnosed with SLE on time, despite of positive ANA and dsDNA. Antiphospholipid syndrome and Raynaud syndrome are often associated with SLE.

**Case report:** A 24- year-old female patient was admitted to the Emergency Room with polyarthritis. She is a mother of one child who has been conceived through IVF because she has had fertility issues. Since a young age, she has been having rheumatologic issues and was misdiagnosed with juvenile idiopathic arthritis at the age of 16. At the time, the lab results showed positive ANA (1:400) and positive dsDNA, and negative RF, but no further assessment was made. In the ER, the patient had severe pain in the knees, hands, feet, spine, and pelvis. She stated she felt paresthesia in her hands. On her hands she also had clear signs of Raynaud syndrome, with puffy fingers and digital infarctions. . Treatment with IV glucocorticoids was started immediately (SoluMedrol 60mg) with a noticeable positive effect, and the patient has been admitted to the Department of Clinical Immunology and Rheumatology. Lab results showed high inflammatory markers, lymphopenia and high complement consumption. Also, high positivity of antiphospholipid antibodies (aCl-IgG, aCl-IgM, beta2-GPI, LAC) was found. History of positive ANA and dsDNA referred to the high possibility of systemic lupus erythematosus and after receiving positive ANA (1:12 800), dsDNA and histones test results, the diagnosis was confirmed. During her stay at our department, the patient suffered from severe headaches (migraine). Also the patient reported cognitive impairment. Considering all symptoms and lab results, our patient's final diagnosis was systemic lupus erythematosus with Raynaud syndrome. Further treatment was done with chloroquine and antiaggregating therapy Discussion: Although the patient has been treated with NSAR for juvenile idiopathic arthritis at a younger age, further rheumatologic assessment and treatment was never made, which led to worsening of the patient's symptoms. After hospital admission the patient has been diagnosed with SLE and Raynaud syndrome. Also, the patient was triple positive for antiphospholipid antibodies.

**Conclusion:** The main message of this case report is that all practitioners should reevaluate the patient's initial diagnosis before further action. Also, in rheumatologic patients, especially patients with SLE, who have history of thromboembolic event or fertility issues, antiphospholipid syndrome has to be considered as a secondary diagnosis.



## How to stay positive when vasculitis is ANCA-negative?

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**Presenting author:** Weronika Przybyszewska

**Tutor:** MD PhD Stanisław Niemczyk

**Introduction:** Vasculitis is a group of rare disorders characterized by the presence of specific antibodies. ANCA antibodies are a commonly used markers but in some patients they may be absent which leads to a diagnostic challenge.

**Case report:** A 62-year-old man was transferred from the regional hospital to the Department of Nephrology at the Military Institute of Medicine in Warsaw for further diagnosis and

treatment. A few days earlier patient was admitted due to malaise, arthralgia and oliguria. Patient's medical history included chronic sinusitis, type 2 diabetes mellitus and chronic renal disease in stage G4. The lab results revealed increased creatinin level and urine analysis showed massive proteinuria and hematuria. CT scan of the thorax presented diffuse ground glass opacities and masses in the paranasal sinuses. The preliminary diagnosis of rheumatoid arthritis was put forward and patient was started on methyprednisolone which led to a transient clinical state improvement. On admission to the Department patient presented a transient weakness of the right upper limb. The left hemisphere ischemic stroke was suspected which was later confirmed by the imaging tests. Patient was then put on acetylsalicylic acid and the symptoms completely resolved without further focal injuries. The laboratory exams excluded the presence of ANCA, aCCP, anti-GBM and anti-dsDNA antibodies. Due to clinical presentation and additional examinations results patient was diagnosed with pulmonary renal syndorme in the course of vasculitis without ANCA antibodies. Patient was started on steroids and cyclophosphamide according to the CYCLOPS protocole. Few months later patient's condition deteriorated and peritoneal dialysis was started due to end-stage renal disease. Due to persisting symptoms the treatment proved to be ineffective and patient was qualified for the regimen with rituximab which eventually led to disease remission.

**Conclusions:** Vasculitis is a rare diagnosis but should always be considered in patients presenting multiorgan dysfunction.

## **Varied shades of Sjögren's syndrome- never judge a book by its cover. Case report**

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**Tutor:** MD PhD Monika Sarnat-Kucharczyk, Prof. Dorota Pojda-Wilczek

**Introduction:** Sjögren's syndrome is a chronic inflammatory autoimmune disease. It is characterized by lymphocytic infiltration of exocrine glands, leading to their significant destruction and dysfunction. Lacrimal and salivary glands are commonly affected, causing dryness of eyes and mouth. Patients may also develop a wide range of severe systemic manifestations.

**Case report:** The subject of the study is the case presentation of a 64-year-old woman who experienced the following symptoms: intensified dryness of eyes and mouth, which particularly developed severe ocular manifestations such as keratopathy and numerous conjunctival adhesions in both eyes as well as corneal ulceration of the right eye. Aforementioned state of the right eye was qualified for keratoprosthesis transplant. These conditions required both intensive pharmacological and surgical treatment. Sjögren's syndrome was diagnosed on the basis of symptoms, a positive Schirmer test and the presence of SS-A antibodies. Except for ocular symptoms, the patient developed other systemic signs associated with respiratory, digestive and osteoarticular systems. Permanent coughing up purulent discharge, articular and muscle pain, decreased exercise tolerance, chronic obstructive pulmonary disease and gastroesophageal reflux disease caused significant decrease in the quality of patient's life.

**Conclusion:** This work provides an interdisciplinary overview of a case of systemic disease. Although, the main clinical manifestations are severe ophthalmic complications, the patient suffers from other diseases that very often accompany Sjögren's syndrome. It should be emphasized that patients with Sjögren's syndrome should be provided with multidisciplinary care in order to ensure better control and treatment of primary and comorbid diseases. Widespread underappreciation of Sjögren's syndrome leads to significant underdiagnosis, delays in diagnosis and consequent morbidity and mortality.

## Infective endocarditis of the mitral valve after COVID-19 infection

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**Tutor:** MD Ljiljana Smiljanić Tomičević

**Introduction:** Infective endocarditis (IE) is defined as an infection of the endocardial surfaces of the heart. If left untreated, IE is inevitably fatal. We present a case of mitral valve infective endocarditis in a patient previously diagnosed with COVID-19.

**Case report:** A 46-year-old male patient was hospitalized at the Department of Clinical Immunology and Rheumatology due to intermittent fever (up to 39, 5°C), high inflammatory parameters (CRP>300), thoracoabdominal herpetic skin efflorescences, and an intermittent skin rash. The patient had already been hospitalized and treated two months prior because of COVID-19 caused bilateral pneumonia. During the current hospitalization, under the presumption of sepsis, the patient received antibiotic therapy (ceftriaxone and linezolid) and oral acyclovir for herpes zoster skin lesions. The patient developed palpable purpura on his extremities. Janeway lesions could be seen on his palms and Osler's nodes on his fingertips. Initially, the patient did not have any heart murmurs, but soon after the lesions and nodes appeared, a systolic murmur (2-3/6) could be heard. The murmur did not coincide with other typical IE symptoms, such as shortness of breath or precordial pain. However, blood culture results came back positive for *Staphylococcus aureus* and *epidermidis*. Although no significant pathology could be seen on the transthoracic echocardiogram, the transesophageal echocardiogram showed a large endocarditic vegetation on the posterior cusp of the mitral valve alongside a significant mitral insufficiency. Soon after, the patient underwent mechanical mitral valve replacement and is now stable.

**Conclusion:** The correct diagnosis could have been easily missed as the patient didn't present many typical signs or symptoms of infective endocarditis. The evidence on COVID-19 causing IE is pretty sparse, however vegetation development begins through transient bacteremia and is followed by the binding of bacteria to damaged endothelium. This could perhaps explain how SARS-CoV-2 and the systemic inflammation caused by it could be a potential risk factor for IE. Although it is still unknown whether COVID-19 is a legitimate risk factor for infective endocarditis, practitioners should be aware of this potential complication as it can be easily missed because of lack of symptoms. Hopefully, future studies will show definitive answers because if left untreated, infective endocarditis is a fatal disease.

## **Case study Internal Medicine 2**

**Coordinators: Agnieszka Kopisas, Roksana Pabich**

**Jury:**

**Monika Żurawska-Kliś MD PhD**

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## **Patient with tuberous sclerosis complex and intellectual disability undergoing living donor preemptive kidney transplantation: a case report**

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**Presenting author:** Agnieszka Kluz

**Tutor:** MD PhD Jolanta Gozdowska

**Introduction:** Tuberous sclerosis complex is a rare autosomal dominant genetic disease caused by mutations of either of two genes, TSC1 and TSC2. Hamartomas and benign tumours of some organs, especially brain, lungs and kidneys are characteristic for this illness. It's often associated with intellectual disability and intractable epilepsy. Kidneys are involved in 40-80% of patients. Renal manifestations include angiomyolipomas (AML), multiple cysts and renal cell carcinoma. AMLs increase bleeding tendency and the risk of renal insufficiency which end-stage develops in 1% of affected patients. Kidney transplantation (KTx) is a preferred the end-stage renal disease treatment method that is associated with better prognosis and quality of life of patients with TSC.

**Case Report:** 38-year-old woman suffering from TSC since early childhood has developed multiple complications associated with this disease. Patient was diagnosed with brain tumour – giant cell astrocytoma – which was removed in 1992. In 2006 right nephrectomy was performed due to the unsuccessful right renal artery embolization after the massive hemorrhage into the AML. Moreover, the right idiopathic pneumothorax occurred twice. Therefore, the video- assisted thoracoscopic surgery and pleurodesis were conducted (2006, 2013). Because of chronic renal failure development and secondary erythrocytopenia the patient was involved in anaemia treatment program so that she was given erythropoietin. Furthermore, woman was also getting medications for hypertension and intractable epilepsy. Patient is intellectually disabled and unable to make decisions on her own. Her legal guardians (parents) make all decisions associated with her treatment. Diagnostic and therapeutic procedures demanding cooperation were conducted under anesthesia. Due to end-stage renal failure the patient required the renal replacement therapy (RRT). Preemptive KTx was the best solution for this patient. Procedures such as hemodialysis and peritoneal dialysis were infeasible to perform due to the intellectual disability that inhibits essential cooperation. During KTx qualification tests the expanding AML with risk of hemorrhage was noticed. The patient was qualified to simultaneous left nephrectomy and KTx from the living donor (father). The surgery was performed on the 2nd of June 2020. The patient is looked after by her parents, stays in good general condition and follows the strict post-operative immunosuppressive regimen (prednisone, mycophenolate mofetile and tacrolimus). Creatinine level is maintained at 0,6-0,8 mg/dL.

**Conclusions:** Patients with significant intellectual disability that prevents maintaining the conscious cooperation, who require RRT, must have individually adjusted therapy. In the case of presented patient, it was decided to perform the preemptive kidney transplantation from her determined father. Desire to limit ailments associated with the operations, such as pain and anxiety, was the reason for performing two surgical procedures which meanings weren't understood by the patient.

## **Difficulties with kidney transplantation qualification of a high immunized patient – a case report**

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**Tutor:** MD PhD Jolanta Gozdowska

**Introduction:** The immunization of patients with kidney insufficiency reduces the chances of being qualified for transplantation as well as it increases the risk of organ rejection.

**Case report:** A case of a 40-year-old patient with end-stage kidney failure due to reflux nephropathy, who was treated with hemodialysis since 1986, underwent complete nephrectomy and subsequently, kidney transplant from a deceased donor, in 1990. After two years, the transplanted organ had to be removed due to recurring infections and chronic rejection. Since then, the patient has been treated with hemodialysis for 20 years. The major concern was the vascular access, many arteriovenous fistulas were made, in 2013 a GoreTex subclaviculoiliac vascular prosthesis, that had recurrent thrombosis events. In 2015 the patient underwent a cystoprostatectomy, due to recurrent infections, despite urethral atresia. Due to high immunization (PRA max 100%, lowest 86%), he wasn't qualified for kidney transplantation. Because of the fistula malfunctioning, he was reported for urgent transplantation. The operation took place the 5th of July 2019. The kidney was transplanted into the peritoneum, with urine drainage to the Bricker loop. The following immunosuppression treatment was applied: thymoglobuline induction, glucocorticoids, mycophenolate mofetil, and tacrolimus. During two months the patient was oliguric (diuresis 100-300 ml). The patient was treated with hemodialysis. HLA antibodies were monitored, and DSA were found. Two weeks after the transplantation a surgical biopsy was made and the histopathological exam showed acute antibody-mediated rejection and acute thrombotic microangiopathy. There were used infusions of methylprednisolone, intravenous immunoglobulins (2g/kg) and rituximab. The kidney started functioning after two months.

**Conclusion:** high immunization lowers patients' chances but does not rule out the possibility of organ transplantation. However, the risk of rejection is high. A good solution would be desensitization, thanks to which patients would have a chance for earlier transplantation.

## Multiple complications in patient cured from Covid-19

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**Presenting author:** Bartosz Stangiewicz

**Tutor:** MD PhD Rafał Kowalczyk

**Introduction:** Effective treatment of patients with SARS-Cov-2 is a difficult task. Unfortunately, successful healing from Cov19 infection is often not the end of the treatment process. Post-infection complications may appear in various ways. Starting with most common such as: fatigue, dyspnea, cough to more severe as ARF, myocarditis or sepsis. The following case shows a therapy of the post-infection complications that occurred in convalescent.

**Case report:** A 47-year-old male was admitted to ICU from a homonymous hospital after 25 days of SARS-Cov-2 therapy. The PCR test for the Cov19 was negative. He had a history of hypertension. On admission, the patient was conscious. He was ventilated through a tracheostomy. During previous hospitalization, he was dialysed due to ARF. First of all, the patient reported pain in the left epigastrium. In laboratory tests, the concentration of AML and LIP exceeded the limits by 3.5 times. An USG revealed a hypoechoic pancreas and ruled out cholelithiasis. Alcoholism was excluded. Therapy with fluids and metamizole was started. After 3 days, the concentration of AML and LIP decreased. It should be suspected that pancreatitis was induced by Cov19 infection. On admission inflammatory markers were elevated and then increased in the following days. Due to this fact blood culture and bronchoaspirate were collected. *A. Baumannii* and *K. pneumoniae* were obtained in the BCHS and *S. epidermidis* in blood culture. Antibiotherapy was implemented accordingly to the antibiogram. In the next few days, the inflammatory parameters decreased and improvement of patient's general condition was observed. The chest X-ray showed a shadow over the left lower lobe bronchus. The performed bronchoscopy revealed the presence of two dental veneers, which probably were aspirated during intubation. They were removed using a rigid bronchoscope. In combination with bacterial infection therapy, it allowed for discontinuation of mechanical ventilation and closure of the tracheostomy. On the 32nd day of hospitalization the patient reported pain in the chest. An ECG was performed and the concentration of cTn was measured. A huge increase in relation to previous cTn results was noted. At first MI was diagnosed but coronary angiography did not reveal any obstruction of the vessels. Echocardiography showed normal contractility of the heart. Based on previously reported cases we can recognize a

myocarditis induced by Cov19. The patient struggled with dysphagia. The neurologist pointed to possible neuropathy of the critical state of CN XII related to the infection and long hospitalization. On the 40th day of hospitalization the patient was in moderate general condition and was transferred to a rehabilitation center for further treatment.

**Conclusion:** The spectrum of complications caused by SARS- Cov-2 is broad and because of its unpredictability also difficult to treat. Convalescents should be treated with carefulness because of the variety of possible complications even after recovering from Cov19 infection.

## **Acute pancreatitis as clinical presentation of COVID-19 in a patient with HIV infection – a case report.**

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**Presenting author:** Carlo Bieńkowski

**Tutor:** Prof. Justyna Kowalska

**Introduction:** Acute pancreatitis may be caused by many factors such as: viral infections, drugs, alcohol, autoimmune response. SARS-CoV-2 virus requires an angiotensin-converting enzyme 2 (ACE2) transmembrane protein in order to enter the cell. As ACE2 receptors are over 100 times more common in gastrointestinal (GI) tract than in respiratory tract and many SARS-CoV-2 infected patients present GI symptoms.

**Case report:** A 26-year-old, HIV-positive man on effective combined antiretroviral therapy with normal CD4+ lymphocyte count level was consulted at the Emergency Department (ER) with mild COVID-19 symptoms and referred for home isolation. Two weeks later and three weeks from first symptoms, he returned to ER with a three-day history of nausea and pain in the upper abdomen. He had no symptoms of respiratory tract infection, normal peripheral blood oxygenation and chest X-ray. He was admitted to the hospital and diagnosed with acute pancreatitis basing on the Revised Atlanta Classification. After discharge the patient continued to have food intolerance and abdominal discomfort for several weeks, but COVID-19 did not affect his HIV course. Three months post COVID-19 his anti-SARS-CoV-2 IgM and IgG antibodies were negative, and low level of 2 AU/mL of anti-S-RBD IgG antibodies was detected.

**Conclusions:** SARS-CoV-2 infection is the most likely cause of pancreatitis in the presented patient. Several other case reports were published however none in HIV-positive patient. Therefore in COVID-19 patients serum amylase and lipase levels should be included into routine laboratory tests' panel. Abdominal ultrasound and CECT should be considered as diagnostic tool in patients with abnormal laboratory findings or clinical manifestation suggesting GI tract involvement.



## **A Case of Bulbar-Onset Motor Neuron Disease with Cholecystomacrolithiasis**

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**Introduction:** Motor neuron diseases (MND) constitute a group of genetically and symptomatically different neurodegenerative diseases, that present with both upper motor and lower motor lesions, primarily at spinal and bulbar levels. Riluzole is often recommended as the first line drug to prolong survival in MND patients without significant contribution to their cure.

**Case report:** We highlight a case of a 61 years old woman presenting with slurring of speech, difficulty in blowing candles and progressively worsening dysphagia which was initially more to liquid than solids. Through clinical examination, CT and MRI of brain, and NCV studies of all 4 limbs, she was diagnosed with bulbar-onset motor neuron disease and was commenced on riluzole following normal routine tests, including liver function tests. One year later, she returned with anorexia, nausea and mild abdominal discomfort. An US abdomen revealed distended gall bladder with calculi. Riluzole was stopped owing to its predilection for causing hepatotoxicity. The patient refused any surgical intervention and has been off medications since. Another 1.5 years later, she again returned with progressively worsening symptoms of motor neurone disease, including tongue fasciculations, inability to close her mouth, xerostomia and thickening of saliva, along with generalized weakness, nausea and right upper quadrant abdominal pain. US abdomen revealed cholecystomacrolithiasis and an incidental right sided benign simple renal cortical cyst. Patient was planned for ERCP and elective laparoscopic cholecystectomy.

**Conclusions:** Gastrointestinal dysfunction has been documented in MND, but there is scanty literature regarding occurrence of cholelithiasis in bulbar-onset MND. Further, riluzole has been known to cause hepatotoxicity with elevation of AST, ALT and bilirubin levels. However, there is currently no evidence to suggest the role of riluzole in bile stasis and cholelithiasis.

## ANTI-AMPHIPHYSIN ANTIBODY-INDUCED PARANEOPLASTIC-AUTOIMMUNE ENCEPHALITIS: A CASE REPORT

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**Presenting author:** Emilija Kavaliauskaitė

**Tutor:** MD PhD Rūta Mameniškienė

**Introduction:** Immune-mediated syndromes affecting different levels of the nervous system and associated with cancer are called paraneoplastic neurological syndromes (PNS). PNS develop in only around 1% of malignant diseases, occurring most frequently in small-cell lung carcinoma. These disorders are often described as encephalitis with onconeural antibodies or classical PNS. Classic onconeural antibodies that are directed against intracellular antigens, include anti-Hu, -Yo, -Ri, amphiphysin and others. Amphiphysin antibodies were first reported in women with breast cancer and stiff-man syndrome and they are often detected in patients with encephalomyelitis, cerebellar degenerations, optic neuropathy. Studies indicate that they are associated with various paraneoplastic neurological syndromes and tumors and do not present as a well defined syndrome.

**Case report:** We present a rare case of paraneoplastic-autoimmune encephalitis caused by anti-amphiphysin antibodies. A 54 year old man presented with recurrent generalized tonic-clonic epileptic seizures, visual impairment in the right eye, impaired perception of the right side of the body, feeling of selflessness in the right limbs and paresthesia. Laboratory tests showed lymphocytic leukocytosis in the serum and increased protein levels in the CSF. Region of encephalomalacia in the left temporoparietal area with a small surrounding gliosis, decreased left hippocampus, thinned gray matter layer were shown in brain MRI. Other imaging tests showed no neoplastic process. Epileptiform potentials in the left temporal region were recorded during EEG. Due to suspected autoimmune encephalitis a panel of autoimmune encephalitis antibodies in serum was performed and results showed positive anti-amphiphysin. Treatment with levetiracetam, valproic acid, methylprednisolone pulse therapy and oral prednisolone was administered.

**Conclusions:** Diagnosing paraneoplastic-autoimmune encephalitis is often difficult because of the absence of a particular clinical pattern and imaging or laboratory abnormalities. In this case patient complaints and clinical findings were not specific to any immune-mediated syndrome. Epileptic seizures are more common in GABAAR, GABABR, NMDA or LGI1 antibody induced autoimmune encephalitis. The main diagnostic tool in this case remained the detection of anti- amphiphysin antibodies in serum. Detecting antibodies against onconeural antigens has high specificity for paraneoplastic syndromes but they are detected in only 60-70% patients with PNS. 60% of patients develop a PNS clinic before the tumour is detected therefore close oncological follow-up every 3–6 months for at least 5 years is suggested

## The Medical Story of One in A Million Patient – late diagnosis of Perrault Syndrome

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**Presenting author:** Hanna Laudy- Wiaderny

**Tutor:** MD PhD Rūta Mameniškienė

**Introduction:** Perrault syndrome is a rare autosomal recessive disease with its prevalence reaching

<1/1000000. It is characterized by bilateral sensorineural hearing loss in both sexes and ovarian dysgenesis only in females, which may or not be, accompanied by neurological abnormalities. Typically, women are diagnosed around the age of 22 with past history of delayed puberty and primary amenorrhea.

**Case report:** A 36-year-old woman was admitted to the Department of Gynaecological Endocrinology for endocrinological screening due to primary amenorrhea and premature ovarian insufficiency. In the early childhood she was diagnosed with profound bilateral hearing loss – back then it was associated with the use of gentamicin. At the age of 18, as menarche failed to occur, she underwent cytogenetic examination, which confirmed the correct female karyotype 46,XX. Because of ovarian insufficiency, she was prescribed hormonal replacement therapy. Her other comorbidities include kidney failure, osteoporosis and Addison-Biermer anaemia. On admission, on ultrasound examination uterine hypoplasia and vestigial ovaries were found. Laboratory tests results revealed hypergonadotropic hypogonadism. In 2019, she underwent MT-RNR1 gene testing which revealed mutations connected with aminoglycoside-induced hearing loss. Clinical diagnosis of Perrault syndrome was made - HSD17B4 gene testing are planned.

**Conclusions:** Perrault Syndrome should be taken into consideration in the differential diagnostic of hearing loss concurrent with primary amenorrhea in a 46, XX patient. Advanced genetic testing compared with clinical picture may play an important role in performing final diagnosis. Patient's comorbidities - kidney and autoimmune diseases - are not typically encountered in the literature.

## **Atypical presentation of acute disseminated encephalomyelitis after tick-borne encephalitis**

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**Presenting author:** Jakub Okrzeja

**Tutor:** MD Adam Garkowski

**Introduction:** ADEM is an autoimmune, usually a monophasic demyelinating disease of the central nervous system, commonly induced by viral or bacterial infections or vaccination after a lag time of a few days to several weeks. ADEM is usually a disorder of the young, including children and young adults and rarely occurs in middle-aged adults as in the patient described in our case report. Isolated lesions in acute disseminated encephalomyelitis (ADEM), presented in this case are also unusual.

**Case report:** A 51-year-old woman with a history of arterial hypertension and tick bite (3 weeks before admission) was hospitalized with a fever and headache, which lasted for 3 days. Methods which were used to establish a rapport included: MRI, CT, blood count, CSF testing. The diagnosis of tick-borne encephalitis (TBE) was made. The patient was discharged home in good general condition. After 2 months, the patient complained about a two-week history of moderate headaches. This time, examination methods included: MRI, CSF testing, serological examination. Test results confirmed the diagnosis of acute disseminated encephalomyelitis (ADEM).

**Conclusion:** Herein, we report atypical presentation of ADEM presenting as single focal lesions in a middle-aged woman after tick-borne encephalitis. A solitary or single focal lesions (like in this case) are rare, and atypical for ADEM, but possible. Additionally, to our knowledge, this is the first case described in the literature of a patient with ADEM after TBE.

## Clinical approach to monoclonal gammopathy of renal significance - a case report

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**Tutor:** Prof. Jarosław Czyż

**Introduction:** Monoclonal gammopathy of renal significance (MGRS) is a group of nonmalignant or premalignant disorders in which kidneys are damaged by monoclonal immunoglobulins. They can aggregate, causing glomerulopathy or vascular obstruction. MGRS does not meet the diagnostic criteria for multiple myeloma (MM) or a lymphoproliferative disorder and accounts for approximately 10% of MGUS. 10% of patients with MGRS progress to MM within the first year after diagnosis. This results in a higher chance for relapse after kidney transplant and lower renal survival rate. Those patients often require treatment in order to prevent progression to end-stage kidney disease.

**Case report:** A 58-years old patient visited the Haematological Outpatient Clinic after receiving a referral from the Nephrology Department in January 2020 due to monoclonal gammopathy (MG), hypertensive angiopathy and stage 3 chronic kidney disease (CKD). Abnormally high levels of IgM immunoglobulins and  $\kappa$  free light chains were detected in serum protein immunofixation. Subsequent appointments showed a systematic decrease in renal functions with a stable monoclonal protein level. The patient was referred for a kidney biopsy in May 2020. The biopsy, performed in August 2020, revealed segmental glomerulosclerosis, diffuse interstitial fibrosis, and the presence of PAS-negative deposits with mediocre lumen obstruction. Electron microscope examination showed IgM  $\kappa$  fluorescence along basal membranes of renal tubules and around the wall of blood vessels, suggesting Light Chain Deposition Disease. After regular observation, the patient was admitted to the Department of Hematology in February 2021 due to CKD progression. Following bone marrow biopsy showed the abundance of IgM  $\kappa$  proteins and lymphocytes. Chemotherapy based on bortezomib and dexamethasone was started and well-tolerated by the patient. After discussing the terms of follow-up and further treatment the patient was dismissed on 15th February.

**Conclusion:** The diagnosis of MGRS remains challenging. Clinical suspicion of MGRS arises when an MG is detected in a patient with renal impairment or an MGRS compatible lesion is identified on a kidney biopsy. The discrepancy between MG and monoclonal deposit in the renal biopsy would argue against MGRS. Diagnosis is often delayed, resulting in worse renal functions prior to therapy. This underscores the importance of maintaining a low threshold for clinically suspecting MGRS. No guidelines regarding the appropriate time to start therapy in patients with MGRS exist. Expert consensus indicates chemotherapy in patients with CKD stages I to III and patients with CKD IV or V stage with extrarenal involvement or plans for renal transplant. Haematological response to clone-directed treatment, usually bortezomib and dexamethasone, correlates with a renal response and prolongs renal survival.

## HIV related wasting syndrome or Anorexia Nervosa?

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**Tutor:** MD Brigita Baks

**Introduction:** Weight loss late in the course of HIV disease is common. Unwanted loss of more than 10% of body weight with either diarrhea or weakness and fever for 30 days is considered as HIV related wasting syndrome. We present a patient with a reported intentional weight loss of 40% in 6 months and a prior diagnosis of Anorexia Nervosa, who presented with symptoms characteristic of wasting syndrome.

**Case report:** 40 year-old HIV positive Caucasian female was referred to the eating disorders department due to suspected Anorexia Nervosa by a regional psychiatric institution where she was treated for the last month. On physical examination the patient was pale, asthenic (BMI 18 kg/m<sup>2</sup>), hypotensive (BP 100/60 mm Hg) with tachycardia (105 bpm), she had general fatigue and difficulties walking without assistance. On a mental status examination, she was well oriented in person but disoriented in space and time and MMSE could not be performed. She presented symptoms characteristic of cognitive and memory impairment (could not recall recent events or chronology of events, had difficulty concentrating and sustaining attention) and psychological changes (apathy, withdrawal, inappropriate behaviour). According to herself and her sister, for the last 6 months she had been restricting calories and lost around 30 kg but could not recall vomiting or when she tested positive with HIV. She expressed she does not eat because has no appetite and feels constant malaise. Medical history revealed the patient was accidentally diagnosed with AIDS (CD4+ 16 cells/mm<sup>3</sup>), had positive toxoplasmosis IgG and cytomegalovirus serology results 1 month ago has since received antiretroviral therapy with Rezolsta 800mg/150mg daily and Combivir 150mg/300mg twice a day. Upon admission, internal feeding through a nasogastric tube with 1400 kcal/day was initiated together with vit. B1 intravenously for prevention of refeeding syndrome. While waiting for lab results the next day, patient's condition deteriorated quickly, she had difficulty sitting up, blood test results showed severe pancytopenia and anemia (RBC 2,09 10<sup>12</sup>/L, HGB 59,4 g/L, HCT 17,5 %) with indication for hemotransfusion. After consultation with an infectologist it was concluded that the current rapid weight loss should be attributed to the AIDS associated wasting syndrome rather than Anorexia Nervosa. Given the weak state of the patient and the need for further investigation with a contrast MRI to exclude HIV- associated neurocognitive disorders, the patient was transferred to a hospital with an inpatient infectious disease department.

**Conclusion:** This case highlights a 40 year old woman who was referred to the eating disorders department with a history suggestive of Anorexia Nervosa, while in fact had symptoms of HIV related wasting. Although the wasting syndrome and HIV-associated neurocognitive disorders have declined since the introduction of combination antiretroviral therapy, it can still be seen in patients with low CD4+ cell counts and patients non-compliant with their treatment.

## Schizoaffective Disorder and Secondary Anorexia Nervosa: case report

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**Introduction:** Schizoaffective disorder (SAD) is a serious mental illness that is relatively uncommon in the general population with a life-time prevalence of around 0.3%. It is characterized by the individual experiencing symptoms of schizophrenia and mood disorders. The comorbidity of SAD and Anorexia Nervosa (AN) is not well documented. AN can appear as a manifestation of SAD symptoms or the symptoms of both disorders may overlap. Additionally, various clinical features of schizophrenia can lead to anorexia. This case presents a patient with SAD who developed AN.

**Case report:** 26 year old Caucasian female was transferred to the eating disorders department in March 2021 after being treated for severe cachexia in the intensive care unit. On physical examination the patient was severely malnourished (BMI 10.9 kg/m<sup>2</sup>), hypotensive (BP 83/59 mm Hg) with amenorrhea, bedsores and had a nasogastric tube for enteral feeding. On mental status examination, she was well oriented but was preoccupied with the fear of gaining weight. The patient had a distorted body image, before hospitalisation restricted calories, excessively exercised, used laxatives and purged after eating. Additionally, she presented symptoms characteristic of depression syndrome (depressed mood, decreased concentration, diminished interests, abulia), schizophrenia (disorganized speech, dysmorphic delusions, persecutory delusion, amimia, stereotypical thinking) and catatonia (marked agitation, negativism, echolalia). The patient was first admitted to the psychiatric hospital in 2013 with psychotic and depressive symptoms after attempted suicide by self-stabbing with scissors and has since been hospitalized multiple times, including twice after attempted suicides by jumping and once for addiction treatment. According to the relatives, she stopped using drugs and seemed to get better but progressively regulated food. Upon admission to the eating disorders department pharmacotherapy with antipsychotics Olanzapine 5mg and Tiapride 100mg as well as an anxiolytic Diazepam 5mg was initiated together with continuation of enteral feeding with Nutrison standard 2000ml/day (2000 kcal/day). After 2 weeks of treatment the patient gained 2 kg but remained agitated and uncooperative. For a closer supervision she was transferred to the acute psychiatric department where Clozapine 100 mg per/os was introduced together with elevation of daily caloric intake to 3300 kcal/day. She became more cooperative and psychotic symptoms diminished within two weeks.

**Conclusion:** The presented case highlights symptom interactions and challenges in management of SAD depressive type disorder with a secondary AN. Many AN symptoms, in particular with a low BMI, may resemble psychotic features. A thorough examination requires focus on the time of the emergence of symptoms and clinical history. In case of severely malnourished patients, somatic condition has to be stabilized before effectively addressing psychiatric disorder.

## COVID-19: postinfectious hypercoagulable state as a probable cause of basilar artery occlusion

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**Introduction:** Latest data shows that Covid-19 infection can lead to neurological complications in up to one third of cases. Although its association with acute ischemic stroke (AIS) is not well understood, the infection-induced hypercoagulable state is thought to play a pivotal role in the etiology of brain ischemia. To date, there is, however, no solid evidence that postinfectious hypercoagulable state can directly lead to cerebral arteries occlusion causing AIS.

**Case report:** We present a 29-year-old patient admitted to the Neurology Clinic with the diagnosis of posterior circulation AIS caused by basilar artery (BA) occlusion that was treated with mechanical thrombectomy. Early neurological improvement, with nearly complete resolution of deficit was observed. Post-treatment MRI showed minor multifocal ischemic changes in the area of the cerebellum, pons and cerebral peduncle.

The cerebral event was preceded by an episode of fever and anosmia that had resolved about 2 weeks earlier. Based on the aforementioned symptoms and positive IgM and IgG antibodies Covid-19 infection was retrospectively diagnosed. In carotid doppler ultrasonography multiple microemboli were noticed. Despite extensive diagnostic work-up, including 48-hour cardiac rhythm monitoring, carotid ultrasound bubble test for right-left shunt, transthoracic and transesophageal echocardiography, head and neck angiography, hypercoagulability panel, no other apparent cause than post-Covid 19 hypercoaguable state detected.

**Conclusion:** Covid-19 infection is thought to cause a plethora of systemic complications. Some of them could be explained by hypercoagulability. There is, however, no solid evidence that it could be a sole cause of the large cerebral vessel occlusion. Our case indirectly show it be a possible scenario.



## **Cholangiocarcinoma in a young male patient after liver transplantation because of primary sclerosing cholangitis – a case report**

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**Tutor:** PhD MD Dorota Cibor

**Introduction:** Intrahepatic cholangiocarcinoma (ICC) is the 2nd most common primary liver cancer and one of its best described risk factors is the primary sclerosing cholangitis (PSC), that isolated can be efficiently treated with a liver transplantation (LT). However, the patients diagnosed with ICC are not eligible for liver transplantation (LT). Nonetheless, among a small number of transplant recipients, the ICC is accidentally diagnosed during histopathological examination of removed liver.

**Case Report:** Onset of the disease in a 20-year- old male patient the PSC was diagnosed. One year later, after the extended diagnosis, the patient was also diagnosed with ulcerative colitis. During the next year, the cirrhosis developed and for the first time the liver transplantation was considered. While remaining under control of the outpatient clinic, the symptoms exacerbated. Liver transplantation Due to the deteriorating condition, the patient was qualified for the liver transplantation. Meanwhile, 12 years after the disease onset, an appendectomy was performed for gangrenous inflammation – the following serious general condition caused liver decompensation. Finally, 2 years later, LT was performed. Further treatment Unfortunately, in the histopathological examination of explanted liver the ICC was diagnosed. In the control abdominal MRI performed 11 months after transplantation the patient was diagnosed with multifocal ICC in the transplanted liver, with tumor spreading in the lymph nodes. The patient could not be classified for another abdominal operation. Three months later, at the age of 35, the patient died in the home hospice.

**Conclusion:** Early liver transplantation in patients with PSC may reduce the risk of developing ICC – the serious condition with poor prognosis. ICC can be incidentally diagnosed inside the explanted liver, therefore the close clinical surveillance should be mandatory in all liver transplant patients, in order to detect and treat ICC as early as possible.

## **A rare case of mycotic aneurism of a transplanted kidney in a patient with Alport Syndrome.**

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**Tutor:** PhD Monika Kraśnicka

**Introduction:** Alport syndrome (AS) is an inherited disorder of basement membranes caused by mutations affecting specific proteins of the type IV collagen family, presenting with nephropathy and extrarenal manifestations such as sensorineural deafness and ocular anomalies. The clinical picture of nephropathy may take various forms, from microscopic hematuria to progressive kidney disease that may lead to end-stage renal failure. A significant proportion of patients require a kidney transplant, which can have serious consequences. A rare but life-threatening complication is the mycotic aneurysm, which will be discussed in this case report.

**Case Report:** The study analyzes the medical history of a 32-year-old patient with end-stage renal disease in relation to Alport's syndrome. From 2009 he was treated with hemodialysis for 5 years. The next stage of treatment was kidney transplant from a deceased donor, which was complicated by bleeding from the anastomosis site of the graft renal artery with the external iliac artery of the recipient. For this reason, the patient required an urgent graftectomy in the first 24 hours after the transplant. In 2015, at the age of 26, he underwent a second kidney transplant, also from a deceased donor. Candiduria without candidemia was diagnosed in the early post-transplant period. A follow-up ultrasound of the graft revealed the pathological vascular structure. Based on the angio-MR examination, the diagnosis of pseudoaneurysm at the site of the anastomosis of the renal artery and the common iliac artery was confirmed. The intraoperative examination established the final diagnosis of the mycotic aneurysm. Reconstruction of the iliac axis and arterial vascularization of the transplanted kidney were performed. Antifungal treatment with fluconazole was continued in parallel. Currently, the excretory function of the transplanted kidney is very good and stable (GFR-52 ml / min), we do not observe yeasts in the urine sediment.

**Conclusion:** The consequences of a very rare disease such as Alport's syndrome can lead to severe kidney failure in a short time and, as a result, end with a kidney transplant. The disease entity we describe, requires an interdisciplinary medical approach. The clinical course of mycotic aneurysms requires a high degree of vigilance from doctors in order to make a correct diagnosis. In this case, such a procedure allowed for quick surgical intervention and preservation of the transplanted kidney

## Difficulties in diagnosing of fibrinogen A $\alpha$ -chain amyloidosis

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**Introduction:** Amyloidosis is a very heterogeneous disease. Correct diagnosis is extremely important, because of various treatment options for different types of amyloidosis. Unfortunately, rare hereditary types are often confused with more common

acquired types. In this study, we present a case report of misdiagnosis of fibrinogen A $\alpha$ -chain amyloidosis.

**Case Report:** We report a 66-years-old man diagnosed with proteinuria in 2009. The kidney biopsy revealed the presence of Congo red-stained amyloid deposits, with no amyloid A. That propounded a diagnosis of light chain amyloidosis or fibrinogen A $\alpha$ -chain amyloidosis. During differential diagnosis, lambda light chains deposits were discovered in adipose tissue and gingiva. Bone marrow biopsy and myelogram excluded multiple myeloma. Echocardiography and biochemical tests showed no signs of heart involvement. Based on performed medical examination light chain amyloidosis was identified. Therefore, the patient received high-dose melphalan and underwent successful autologous peripheral blood stem cell transplantation. However, proteinuria and incorrect levels of light chains were still observed. That caused multiple unsuccessful changes in chemotherapy. In 2019, a kidney biopsy showed the presence of numerous fibrinogen deposits. Recommended DNA analysis revealed a mutation in the fibrinogen gene that changed diagnosis for fibrinogen A $\alpha$ -chain amyloidosis. Therefore, chemotherapy treatment was abandoned. Moreover, successful kidney transplantation was performed because of end-stage renal disease.

**Conclusions:** For today, during differential diagnosis, it is essential for medical practitioners to remember about the possibility of rare and hereditary types of amyloidosis. There are multiple cases where a diagnosis was wrong or delayed because of the atypical course of the disease, coexistence of another disease, and rarity of fibrinogen A $\alpha$ -chain amyloidosis, which mostly resulted in wrong treatment that delayed right therapy and was dangerous for a patient.

## **An extremely dangerous duo - rare kidney disease accompanied by SARS-Cov2 infection.**

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**Tutor:** MD Ewelina Młynarska, Prof. Beata Franczyk

**Introduction:** Rapidly progressive crescentic nephritis is a rare form of glomerulopathy. It is considered a particularly dangerous type of glomerulonephritis because it can lead to end-stage renal disease within only a few weeks.

**Case report:** A 66-year-old woman with no history of chronic diseases, presented to the emergency department concerned about the appearance of her urine. The patient reported recurrent lower extremity edema, an episode of rash on her crus and unintentional weight loss within the last three months. On physical examination, blood pressure reached 160/90 mmHg. Laboratory tests revealed anemia, a GFR of 26.7 ml/min/1.73 m<sup>2</sup>, elevated blood creatinine and urea levels. In the urinalysis, there was also a moderate proteinuria and lysed erythrocytes. A diagnostic procedure targeted at the causes of nephritic syndrome was performed. The patient was qualified for an elective renal biopsy and discharged from the hospital in good condition. On readmission, physician's attention was drawn to high blood pressure, decreased GFR and increased creatinine and urea levels compared to the values noted on previous hospitalization. The biopsy was performed as planned. The biopsy image was consistent with advanced glomerulonephritis with crescent formation. Steroid therapy with metyprednisolone and encortone was instituted. Due to a decrease in GFR to 10.5 ml/min/1.73 m<sup>2</sup> the patient was qualified for renal replacement therapy. On the day of hemodialysis patient's condition deteriorated. The decompensation was characterized by massive oedema, resting dyspnea, tachycardia and severe hypertension. The Abbott test for SARS-Cov-2 was performed with positive result. Due to deteriorating clinical condition, the patient was qualified for ICU treatment. Despite invasive methods of ventilatory support, the patient died.

**Conclusion:** Rapidly progressive glomerulonephritis is a challenging disease both diagnostically and therapeutically. The prognosis of the disease is uncertain, especially when glomerulopathy is accompanied by SARS-Cov2 infection.

## The challenges in diagnosing skin lesions after long-term therapy with topical steroids – case report

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**Tutor:** Prof. Aleksandra Lesiak, MD PhD Małgorzata Skibińska

**Introduction:** Tinea corporis is a common fungal skin infection caused by dermatophytes. The most common clinical manifestations include circular or oval lesions with sharp margins and raised erythematous scaly edge. Patients commonly present with an itchy, red rash. Many clinical variants of tinea corporis exist rendering the diagnosis difficult especially with prior use of corticosteroids when fungal infection loses its typical morphological features. This is described as tinea incognita, in which the skin lesions are less scaly and more erythematous. Tinea can mimic other diseases like eczema or psoriasis so physicians must be familiar with this condition to make an accurate diagnosis and provide appropriate treatment.

**Case report:** A 50-year-old man was admitted to the department of dermatology due to numerous papules and small nodules on erythematous base on the face and sharply demarcated erythematous eruptions with a raised edge on the neck and right upper limb. Additionally, a few small erythematous, scaly plaques were on the trunk and limbs. The patient had been treated for psoriasis for 3 years with topical steroids. On admission, the patient was in good condition. During hospitalisation, histopathological, mycological and laboratory tests were performed. The differential diagnosis for lesions on the face was discoid lupus erythematosus and rosacea and for the trunk and limbs was eczema, contact dermatitis and tinea corporis. Mycological examinations were negative. The histopathological examination from the skin of the face showed the image most similar to rosacea. The results of the histopathological tests from the skin of the right upper extremity and torso were not specific. The clinical picture of the body lesions resemble tinea incognita so oral antifungal medicine, terbinafine was introduced. The rosacea on the face was treated with oral metronidazole. All skin lesions have resolved after 2 months of therapy.

**Conclusions:** Despite negative mycological examinations the empirical antifungal therapy was started. The chronic use of topical steroids in the treatment of psoriasis could have caused iatrogenic fungal infection and rosacea-like lesions. Corticosteroids carry a risk of side effects, some of which can cause health problems and pose a great diagnostic challenge.

## **Neurological symptoms of thrombotic thrombocytopenic purpura in a patient with systemic lupus erythematosus**

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**Introduction:** Thrombotic thrombocytopenic purpura (TTP) is thrombotic microangiopathy characterized by microangiopathic hemolytic anemia, severe thrombocytopenia, and organ ischemia linked to disseminated microvascular thrombi.

**Case report:** A 22-year-old patient was admitted to our department because of anemia (hemoglobin 90), thrombocytopenia (platelet count 16), and the lower legs' hematomas. At the age of 13, the patient was diagnosed with systemic lupus erythematosus and was treated with cyclophosphamide, rituximab, and mycophenolate mofetil for lupus nephritis, which was discontinued after 4 years. During his stay at our department, the patient had a 30-minute-long episode of right-sided central facial paralysis, transitory motor dysphasia, and paresthesia of the right arm. After this incident, the patient stated he had a similar episode a few days ago. Emergency MSCT and MRI brain scans, as well as MRA, did not show any pathologies. After this event, peripheral blood smear test was indicated with suspicion of thrombotic thrombocytopenic purpura. The results of the test showed schistocytes. We also did direct and indirect Coombs test for autoimmune hemolytic anemia, both of which were negative. Also, we found no ADAMTS13 activity. These results are highly suggestive of the diagnosis of thrombotic thrombocytopenic purpura. After plasmapheresis (five sessions), IV corticosteroid therapy and rituximab, platelet count and hemoglobin level were starting to normalize, and hematomas of the lower legs regressed. The patient did not have any other neurological event. **Discussion:** TTP and systemic lupus erythematosus (SLE) are rarely present simultaneously and present diagnostic and therapeutic dilemma for caregivers. The overall incidence of TTP in SLE patients is unclear, but some studies report the incidence to be around 0.5%. Neurologic abnormalities, which are sometimes misunderstood as acute ischemic stroke, are often associated with TTP.

**Conclusion:** TTP should always be considered in the differential diagnosis in patients with transitory neurological disorders, especially if they have hemolytic anemia and thrombocytopenia.

## **Primary cutaneous B-cell lymphoma mimicking pyoderma gangrenosum- a rare case and challenging diagnosis**

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**Tutor:** MD PhD Małgorzata Skibińska, Prof. Aleksandra Lesiak

**Introduction:** Primary cutaneous lymphomas represent a group of lymphoproliferative disorders primarily involving and remaining confined to the skin at diagnosis. Cutaneous B-cell lymphomas (CBCLs) are rare and constitute 20% of all primary cutaneous lymphomas. They have an overall favourable diagnosis and are most often slow-growing. Clinically, they may present themselves as painless solitary or multiple nodules. The diagnosis of CBCL is established by analysis of a skin biopsy specimen and immunohistochemical examination. Anaplastic diffuse large B cell lymphoma is a rare morphologic variant characterized by its particularly uncommon occurrence and unfavourable medical diagnosis. Skin manifestation of this disorder is rare as it is primarily mostly confined to the nodes. Pyoderma gangrenosum (PG) is a rare inflammatory condition characterized by its rapid evolution and uncertain etiology. It may present itself in the form of deep ulcerative lesions with a distinct border commonly occurring on the legs, with pain being the main complaint. It is often observable concurrently with underlying systemic diseases or malignancy.

**Case report:** We present the case of an 85 years' old Caucasian male patient with severe, painful ulceration and necrotic crusts located on the face, right lower leg and a thigh that developed over three months. They were clinically consistent with pyoderma gangrenosum. PG treatment was instituted and a biopsy of the lesions performed. However, the results received did not correspond with a clinical presentation of the disease and its original diagnosis. What appeared as pyoderma gangrenosum revealed itself to be a neoplasm. Examination of a skin biopsy specimen showed infiltration with lymphoma cells corresponding with a primary cutaneous diffuse large B- cell lymphoma, anaplastic variant. The patient's condition was compounded by multiple comorbidities - atrial fibrillation, chronic heart failure, hypothyroidism, hypertension, benign prostatic hyperplasia; and he had previously undergone a pacemaker implantation. An abdominal CT scan detected enlarged periaortic lymph nodes. Due to rapid deterioration of his already serious condition the patient died before the biopsy results were obtained and lymphoma treatment could be implemented.

**Conclusion:** The underlying case exhibits an uncommon clinical picture of primary cutaneous diffuse large B-cell lymphoma. It also demonstrates the difficulty of it being distinguished from pyoderma gangrenosum based on skin lesions. PG diagnosis relies on a clinical picture and thus is often challenging. The case under study stresses the importance of a histopathological examination and immunohistochemical tests in the differential diagnosis of PG and CBCL. Further, it underlines how crucial it is to not become readily deceived by the clinical presentation of the disease, and to always perform an extensive differential diagnosis.

## What can we do with yellow nails in nephrology department? – YNS case report

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**Introduction:** Yellow nail syndrome (YNS) is a rare disease, in which can be observed: slow-growing, hard, yellow, and dystrophic nails, lymphedema, and respiratory tract disease. There was more than 400 cases described in literature to 2017. No specific treatment is considered, so in patient symptomatic treated is applied. We did not find in the literature any case of patient with end-stage renal disease and YNS. This is why we decided to describe a patient with ESRD and YNS.

**Case report:** A 43-year-old woman suffering from end-stage renal disease (ESRD) because of diabetes mellitus type 1. (DM t.1), with hypertension, and YNS recognized since 2005, was involved to peritoneal dialysis (PD) treatment since October 2019. Before she was send to the nephrology department she suffered from recurrence pleural effusion, bronchiectasis and huge proteinuria, nephrotic range (in course of DM). In effect she had dispnoea and peripheral swelling. At the beginning of renal replacement therapy (RRT) she underwent some hemodialysis (HD) sessions in order to dehydrate her. Then peritoneal catheter was implanted and PD was involved. Despite middle-strong fluids were used to performed PD treatment, overhydration with coexisting dispnoea were still present in our patient. Ultimately, after nine months of PD, she was transferred to HD treatment.

**Conclusions:** PD treatment seems to be not enough for patients suffering from ESRD and YNS with recurrent pleural effusion and respiratory insufficiency. In such patients we recommend hemodialysis rather than peritoneal dialysis. Hemodialysis is much more effective in dehydration of the patient. This improves the patient's status and the quality of live.



## **Peptide Receptor Radionuclide Therapy for the Treatment of Pancreatic Neuroendocrine Tumor Recurrence in Patient Who Underwent Liver Transplantation**

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**Tutor:** Prof. Tina Dušek

**Introduction:** Neuroendocrine tumors of the pancreas (PNETs) belong to the highly heterogeneous group of neoplasms arising from pancreatic islet cells. PNETs are relatively rare, representing 1% to 2% of all pancreatic neoplasms and 7% of all NETs. Peptide receptor radionuclide therapy (PRRT) is one of the newer second-line treatment approaches for advanced and/or metastatic PNETs with high somatostatin receptor expression. No randomized, prospective trials of PRRT in patients with PNETs have yet been reported up to this date, especially not in patients who underwent liver transplantation like the patient presented in this abstract.

**Case report:** The patient is a 40-year-old asymptomatic man who was hospitalized due to reevaluation of disease after an outpatient increase in the concentration of chromogranin A. Patient is first seen in the unit in 2011 because of a tumor of the pancreas that was found incidentally during a radiologic procedure. At the time of diagnosis, multilocular hepatic metastases are registered. The percutaneous biopsy confirmed the diagnosis of PNET classified as well-differentiated grade 2 with proliferation index Ki-67 12 % and mitotic count 2/10 HPF with the presence of perineural invasion and angioinvasion. He was treated with a combination of surgical resection, 7 cycles of chemotherapy, and somatostatin analog octreotide. After multiple metastasectomies, in 2014 due to further progression of hepatic masses which became unresectable, the patient underwent orthotopic liver transplantation. 5 years later, a pathological accumulation of radioisotopes during octreotide scan was found at several sites in the skeleton and also in node between lesser curvature of stomach and pancreas suggesting recurrence of the disease. It was decided to treat the patient with PRRT. The patient underwent 3 treatment cycles with <sup>177</sup>Lu-DOTATATE in University Medical Centre Ljubljana. Treatment was well tolerated. Abdominal and pelvic MRI performed after the PRRT showed a decrease in the multiple bone lesions and regression of tumor node between lesser curvature of the stomach and pancreas.

**Conclusions:** PNETs are rare tumors that most commonly metastasize in the liver. Liver transplantation is one of the treatment options for unresectable PNETs with liver metastases but with possible recurrence of the disease. This case demonstrates that PRRT can be an effective and safe choice for PNET recurrence after liver transplantation.

## **Case report: a patient with severe pre-eclampsia diagnosed with HELLP postpartum after caesarian section**

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**Tutor:** MD PhD R. Petrauskas

**Introduction:** HELLP syndrome is complication of pregnancy, believed to be part of the spectrum of pre-eclampsia, which belongs to the category of hypertensive disorders of pregnancy. It is characterized by haemolysis, elevated liver enzymes and a low platelet count. Maternal and foetal complications are more severe in HELLP as opposed to pre-eclampsia alone. In this clinical case a 26- year-old primigravida woman is described with no medical history who presents with signs of HELLP at 38 weeks of gestation, who required emergent delivery of foetus.

**Case report:** 2020-04-02: a 26- year-old primigravida presented to obstetrics triage at 38 weeks of pregnancy reporting lower quadrant abdominal pain, nausea and excessive vomiting for 6 hours prior. Her pregnancy thus far had been without complications. The patient's initial vital signs were concerning: blood pressure 200/120 mmHg, heart rate 96 beats per minute, skin was pale and dehydrated. However, the foetal tracing was unremarkable as it was read as "Category I", which is normal and is not an indicative of hypoxic risk to the foetus. Given the suspicion for severe pre-eclampsia blood and urine samples were taken. The treatment was initiated with sol. Ringeri 1000 ml intravenous, Dopegyt 250 mg per os, Cordipin 20 mg sublingual and sol. MgSo4 10ml intravenous infusion. Few hours later the patient had a seizure (eclampsia) and then an emergency caesarean section (C-section) under general anaesthesia was performed. The patient's intraoperative course resulted in the delivery of a live male neonate, 2848 g weight, 51cm, Apgar 8-8b. At this time, review of her laboratory findings from prior C-section revealed a platelet count of 0.209 ml/l (0.19-0.35) and an ALT of 991.8 (0-34) U/l, AST 1598.8 (0-31) U/l. Blood tests after the C-section revealed a significant decrease in the haemoglobin from 139 g/l to 100 g/l and to 85 g/l few hours after surgery. Her ALT and AST remained elevated and postoperatively and thus she remained intubated and sedated. Given the significant decrease in haemoglobin and concerns for haemolysis, the massive transfusion protocol was initiated. A diagnosis of severe HELLP syndrome was made. The patient remained in the intensive care unit for 6 days and when stabile brought to the obstetrics and gynaecology department, where after a further treatment with Labetalol 200 mg x3 per os, Fraxiparine 0.3ml and antibiotics for 3 more days the patient was discharged.

**Conclusion:** HELLP syndrome prevalence is 0.1% up to 0.8%, but 10% to 20% of HELLP occur with severe pre-eclampsia. There still remains some confusion with standardisation of diagnostic criteria for HELLP as well as defining its exact pathophysiological mechanisms. At this moment besides immediate delivery of the foetus, there is no specific treatment for severe pre-eclampsia and HELLP.

## **Peculiarities of COVID-19 Pneumonia in Combination with Chronic Cardiovascular Diseases: Case Report.**

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**Presenting author:** Nkateko Blessing Muyimane

**Introduction:** COVID-19 or Coronavirus 2019 can be defined as a collection of coronavirus causes by severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2. Pneumonia which is an infection of the lungs is a complication of COVID-19, this in connection to Chronic Cardiovascular Diseases has resulted in the death of numerous people. An investigation was carried out to highlight the pathological changes of the organs of an COVID infected patient.

**Case report:** An 80-year-old woman who was admitted to the KharkivRegional Infection Clinical Hospital with an elevated temperature of 39 C, cough, dyspnea and X – ray examination was revealed to have bilateral pneumonia. PCR test showed positive results for SARS - CoV-2 RNA. Her condition was worsened by acute respiratory insufficiency which led to artificial lung ventilation this, combined with ischemic heart disease and atherosclerosis followed by COVID resulted in the patient dead. Macroscopic examinationrevealed hardening of the inferior portion of both lung tissue and cut surface showed dark red areas of approximately 5 cm in diameter. Additionally, microscopic examination revealed intra- alveolar edema with polymorphic exudate and desquamated alveolar epithelium, vascular hyperemia with hemorrhages and thickening of alveolar wall due to mononuclear infiltration. Fibrin deposits, formation of granulation tissue, proliferation of fibroblasts and focal carnification was found in another section of alveolar. A pathomorphological investigation of the patient showed a final diagnosis of corona viral infection complicated by edema of the lungs with bilateral pneumonia and hemorrhagic syndrome. Accompanying diseases such as atherosclerosis of aorta and coronary arteries, diffuse atherosclerotic cardiosclerosis, eccentric myocardial hypertrophy were additionally diagnosed.

**Conclusion:** From the morphological examination of lung tissue of a corona viral patient described above, it can be shown that there's a clear correspondence with proliferative stage of diffuse alveolar damage which is a common findingof this disease after a period of 5-7 days. Combination of corona viral disease with chronic cardiovascular pathology has an overall influence on the duration of the and the subsequent death of the patient.

## **Insufficiency of the gastric cardia and follicular inflammation of the stomach antrum may result in ineffective levothyroxine absorption**

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**Presenting author:** Paulina Kasperska

**Tutor:** Prof. Kornelia Kędziora-Kornatowska

**Introduction:** Absorption of levothyroxine from oral forms takes place mainly in the small intestine and begins approximately 60-90 minutes after administration of the preparation. Levothyroxine is slightly absorbed in the stomach, while about 21% is absorbed in the duodenum, 45% in the jejunum and 35% in the ileum. The pH of the stomach plays a vital role in the absorption of levothyroxine from the gastrointestinal tract. The pH of gastric juice is physiologically acidic necessary for the correct absorption of LT<sub>4</sub>. Its relationship is inversely proportional, since together with an increase in gastric pH, the absorption of levothyroxine decreases. The drugs that can deteriorate the absorption of levothyroxine to the greatest extent are, among others, iron preparations, drugs for the treatment of peptic ulcer disease, hyperacidity or heartburn. Among them, the most commonly used drugs are proton pump blockers and aluminum-containing antacids. The absorption of thyroid hormones is also significantly disturbed by some drugs used in the treatment of osteoporosis, such as e.g. bisphosphonates. Recently, attention has also been paid to the more frequent use of calcium salts, which are often combined with vitamin D and used as part of the prevention of osteoporosis. Due to the fact that they may interfere with the absorption of thyroid hormones, it is recommended to maintain a slightly longer than the standard interval between thyroid hormones and preparations based on calcium carbonate.

**Case report:** A 47-year-old woman admitted as an emergency internist because of recurrent epigastric pain and dyspeptic ailments and suspected levothyroxine absorption disorders. A patient after thyroidectomy due to an alveolar tumor of the thyroid lobe, and after endoprosthesis of the right hip joint due to degenerative changes, Laboratory test result: TSH - 65 mIU / l, FT<sub>3</sub> - 2.19 pg / ml, FT<sub>4</sub> - 0.49 ng / dl. During hospitalization, the imaging tests performed showed no significant deviations. The gastroscopy revealed insufficiency of the gastric cardia and follicular inflammation of the antrum of the stomach. The levothyroxine absorption test was correct. Laboratory tests revealed vitamin D deficiency and hypercholesterolaemia - vitamin D supplementation was recommended. The patient was prescribed euthyrox N250.

**Conclusions:** The insufficiency of the gastric cardia of the stomach and follicular inflammation of the antrum of the stomach may cause disturbances in the laboratory results: TSH, FT<sub>3</sub>, FT<sub>4</sub> and may lead to other severe complications.

## De novo migraine with aura in the third trimester of pregnancy: a case report

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**Presenting author:** Elena Paškevičiūtė  
**Tutor:** MD PhD Kristina Ryliškienė, MD PhD Diana Bužinskienė

**Introduction:** Among all headache disorders, migraine has the highest prevalence during gestation. The majority of migraineurs experience improvement during pregnancy, but a few may experience migraine for the first time. This poses a diagnostic challenge in the differential diagnosis between primary and life-threatening secondary headache disorders. Because pregnancy itself is an independent risk factor for secondary headache disorders, it is mandatory to exclude these conditions in order to diagnose migraine. There is a large body of literature about pre-existing migraine course during pregnancy and its link with adverse pregnancy outcomes, but there are no studies examining these aspects among women with new-onset migraine during pregnancy.

**Case report:** A 31-year-old female at 33 weeks of gestation (gravida 2, para 2) was referred to the neurologist with a history of two headache episodes seven and four days ago, which she experienced for the first-time in her life. During the episodes the patient experienced visual, sensory and speech disturbances, which were followed by pressing severe headache, rated as 8 out of 10 on a numeric rating scale and accompanied by dizziness. The headache lasted for one day, and dizziness continued to the following day. The patient was investigated for a secondary headache disorder, but laboratory and neuroimaging results were unremarkable. A migraine with aura was diagnosed. The patient was advised to keep a consistent sleep schedule, maintain regular low physical activity, eat regularly and take magnesium supplementation. The patient was informed about a safe treatment approach in case of an acute attack. At 40 weeks of gestation the patient delivered female newborn, weighing 3750g, with Apgar scores of 8 and 9 (due to a nuchal cord). The postpartum period was uneventful. During the subsequent 4 years, the patient did not experience any recurrent migraine attacks and had no pregnancies.

**Conclusion:** In order to diagnose a migraine during pregnancy, exclusion of secondary headache disorders is mandatory. Pregnant migraineur should be regularly monitored for adverse birth outcomes. It is essential to educate patients, provide information about the safe treatment of migraine attacks, and explain non-pharmacological prevention and supplement.

## **SARS-CoV-2 infection as a potential cause of focal segmental glomerulosclerosis in a Caucasian patient without high-risk APOL-1 allele**

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Medical University of Lodz

**Presenting author:** Natalia Cegielska

**Tutor:** Prof. Michał Nowicki, MD PhD Piotr Nowak

**Introduction:** SARS-CoV-2 infection has a negative impact on kidney function and is a strong risk factor of acute kidney injury. There is a growing number of cases of FSGS associated with COVID-19 reported in African Americans with high risk APOL-1 alleles. We present a case of a Caucasian man who developed focal segmental glomerulosclerosis (FSGS) in the course of COVID-19 with no high risk APOL-1 genotype.

**Case report:** A 34-year old man with a history of arterial hypertension but no previous diagnosis of renal disease was admitted to the hospital due to suspicion of acute kidney injury and nephrotic syndrome. He presented symptoms from the digestive system, fever, non-productive cough, loss of taste and smell and dyspnea. Chest CT-scan suggested pneumonia in the course of COVID-19. The test for SARS-CoV-2 was initially negative. Goldflam sign was negative bilaterally. Serum creatinine level was 517.7  $\mu\text{mol/L}$ , serum urea 19 mmol/L, eGFR 12 ml/min/1.73m<sup>2</sup>, proteinuria 26.5 g/24h and serum inflammatory parameters were highly increased. Respiratory support was required due to dyspnea exacerbation. Tests for SARS-CoV2 were repeated and the third in row turned positive. The treatment with dexamethasone and convalescent plasma was started. Partial hypoxic respiratory failure was exacerbating so the patient was transferred to the ICU. Kidney function promptly improved and the patient regained taste and smell. The treatment was continued at the nephrology department. Due to persistent proteinuria the kidney biopsy was performed that revealed both FSGS and chronic tubulo-interstitial nephritis. Patient received dexamethasone i.v. for 2 days followed by oral prednisone. Infection with hepatotropic viruses, ANCA and ANA antibodies was excluded. Genetic tests did not show high risk APOL1 genotype. The patient was discharged after 21 days. Post-discharge follow-up reveals complete COVID-19 symptoms resolution and normalization of renal excretory function. However only a partial remission of FSGS symptoms was achieved with proteinuria 11.7 g/24h. Steroid therapy is continued. 19 weeks after discharge, a second biopsy was performed. Initial results revealed only a partial regression of FSGS changes.

**Conclusion:** APOL1 high risk genotype has been a well-defined risk factor of FSGS in Afro-Americans. It was considered the first hit in COVID-19 and HIV-associated FSGS. Almost all of the several patients described in the literature suffering from COVID-19-related FSGS had high risk alleles. This case shows that SARS-CoV-2 may play a role in the development of steroid-resistant FSGS in Caucasian patients without APOL1 high risk genotype.









## **Case study: Oncology**

**COORDINATORS: JOANNA KUĆMIERZ, KATARZYNA KWAS**

### **Jury:**

**Dorota Jesionek- Kupnicka MD PhD**

**Konrad Stawiski MD**

**Anna Szmigielska - Kapłon MD PhD**

**Damian Mikulski MD**

## Searching for a primary tumor in a patient with lung metastases

Karolina Mizera

Poznan University of Medical Sciences

**Presenting author:** Karolina Mizera

**Tutor:** MD PhD Joanna Jackowska

**Introduction:** Malignant peripheral nerve sheath tumor is a rare, aggressive soft tissue tumor that arises from the peripheral nerves. It mostly occurs in adult patients between the third and fifth decade of life. Usually on the limbs, trunk, and in 20% in the head and neck area. We associate half of the cases with previously diagnosed neurofibroma in patients with type 1 neurofibromatosis. The metastases in the lungs, pleura, and bones occur in around 70% of cases. They made the diagnosis based on the results of the core needle biopsy or open biopsy. The treatment varies depending on the severity and includes surgery, radiotherapy, or chemotherapy.

**Case report:** A 42-year-old male presented with round shadows in the lower parts of both lungs on a chest X-ray in January 2020. They obtained a CT to further define the extent and nature of lesions, confirming interstitial and subpleural metastatic infiltrations. An urgent abdomen and pelvis CT scan presented a lot of fluid in the pleural cavity and multiple, scattered lesions in the lower parts of the lungs. Previously diagnosed with tongue cancer and a neurofibroma in 2008. The patient had a follow-up neck and soft tissues CT in March 2020 regarding a recurrence of tongue cancer. The pathological malignant infiltration present on the left side of the soft palate and covered also the area of the left palatine tonsil and root of the tongue, therefore a performed biopsy with no cancerous changes present. Fine-needle aspiration from exudate present in the left pleural cavity showed atypical cells. They admitted the patient to the cardiothoracic surgery ward with preparation for a wedge resection of the changes in the lungs, a biopsy of pleura, and pleurodesis. After introducing an enormous number of immunohistochemical reactions, the changes in the lungs were metastases of the malignant peripheral nerve sheath tumor. A follow-up neck and soft tissues CT scan in November showed stabilization of the disease with no recent changes and the reduction of the infiltration.

**Conclusion:** The detailed medical history and proper diagnostic imaging are crucial in the everyday work of physicians. We should direct special awareness to the diseases that are risk factors of cancer. A follow-up examination is important to detect a recurrence or appearance of metastases, and we should monitor regularly it.

## **A case of clinical mismanagement of epithelial-myoepithelial carcinoma.**

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Department of Pathology, Chair of Oncology, Medical University of Łódź

**Presenting author:** Katarzyna Góralska

**Tutor:** MD PhD Dariusz Kaczmarczyk, MD Dominik Paprocki, MD PhD Marcin Braun, Prof. Hanna Romańska-Knight

**Introduction:** Epithelial–myoepithelial carcinoma (EMC) is a rare malignant neoplasm arising most commonly in the parotid gland. It accounts for less than 5% of salivary gland malignancies and 1% of all salivary gland tumours, respectively. Because of its non-specific histopathological image, it often can be wrongly diagnosed as a rich cell pleomorphic adenoma. It typically demonstrates a biphasic pattern of outer myoepithelial cells surrounding inner epithelial ducts. Although EMC is a low-grade slowly growing tumour, the recurrence rate reaches up to 40%. The treatment of choice is surgical excision, while efficiency of radiotherapy is questionable. Due to the high risk of recurrence, it is paramount that the margins of the initial surgery ensure complete excision of the tumour. The presented case illustrates a need for these guidelines to be strictly maintained.

**Case report:** A 68-year-old woman presented with recurrence of a left parotid gland tumour, which at the time of admission to Department of Oncological Laryngology of Copernicus Memorial Hospital in Łódź, was asymptomatic. The patient was undergoing treatment for concomitant diabetes, hypertension and hypothyroidism. There were two cases of stomach cancer and one case of cervical cancer in her family history. The primary excision of the tumour was performed in 2014. No medical records related to the first hospitalization are available. In 2020, the routine check-up revealed a soft tissue tumour in the left mandible angle. Fine needle aspiration demonstrated groups of cytoplasm-free epithelial cells with features of anisokaryosis (“naked nuclei”). The patient was referred to surgical excision of the tumour. In the post-operative histopathologic report, recurrence of epithelial-myoepithelial carcinoma with neoplastic cells in the centre and outside of the parotid ducts as well as a positive surgical margin (presenting tumour cells) were documented. In order to enlarge the extent of excision conducted in 2020, the patient underwent subsequent surgery in 2021, i.e. subtotal parotidectomy of the left parotid gland. Postoperative histopathology examination showed focal, abundant fibrosis and a single EMC focus (dia. 1mm). The minimal surgical margin was found to be preserved (5mm).

**Conclusion:** Although EMC is a low-grade malignant and indolent tumour with a good survival rate, it represents relatively high tendency for local recurrence. The presented case demonstrates that the surgical procedure carried out within adequate margins is a safeguard against tumour relapse and a prerequisite for a good prognosis of the EMC patients.

## **Primary choroid melanoma metastases to the female genitourinary system – a rare case report and review of literature**

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**Presenting author:** Anna Zakrzewska

**Tutor:** MD PhD Marcin Braun, Prof. Hanna Romańska

**Introduction:** Melanomas infrequently originate from either mucous membranes or ocular structures like iris, ciliary body or choroid, and primary uveal melanoma is relatively rare. Approximately half of the cases metastasize mostly to liver, lung, bone, skin, subcutaneous tissue, and lymph nodes. Distant metastases occur after a several years from the initial diagnosis. Moreover, metastases of orbital melanoma to the female genitourinary organs are exceedingly uncommon. Consequently, metastatic melanoma is likely to be overlooked in the differential diagnosis of female genital tumors or confused with other secondary or primary neoplasms, which invariably causes diagnostic problems. We describe here a rare case of choroid melanoma with metastases to the female genitourinary system, and outline difficulties in the process of its accurate diagnosing.

**Case report:** In 2019, a 70-year-old Caucasian woman was admitted to the hospital with ascites. Cytology of ascitic fluid revealed high numbers of histiocytes, macrophages, lymphocytes, as well as the presence of small, hyperchromatic, atypical cells. Imaging studies showed pathologic, solid masses localized in the pelvic cavity. The patient was subjected to surgery, during which multiple tumours were found in ovaries, fallopian tubes, uterus, greater omentum, visceral peritoneum and appendix. Subsequently, a total hysterectomy, adnexectomy, omentectomy and appendectomy were conducted, and the resected material was subjected to histopathologic examination. Histopathological analysis revealed diffuse infiltration with poorly differentiated cells of nonepithelial origin. Immunohistochemical staining showed positivity for: HMB-45, Ki-67, Melan-A, SMA and focally for: S100 and desmin and negativity for: AE1/AE3, MyoD1. The microscopic image was suggestive of perivascular epithelioid cell tumour (PEOMA). However, as the results were equivocal, further investigation was called for. A detailed retrospective analysis of the patient's medical history revealed that in 2012 the patient underwent an enucleation for choroid melanoma. Archival samples of the removed eyeball were sent for histopathologic reassessment. The microscopic analysis combined with the immunohistochemical test led to the final diagnosis of metastases of uveal melanoma to the female genital track. In bone scintigraphy, osteal metastases were not present. Palliative treatment was administered. The patient died within 10 months.

**Conclusion:** The presented case demonstrates the unpredictability of melanoma. It not only illustrates its capacity to metastasise to various distant atypical sites, but also it emphasizes the importance of a thorough anamnesis and precise documentation.

## **An unusual mesenchymal tumour in the paediatric population in 10-year-old female – a case report**

Marta Andrzejewska

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**Presenting author:** Marta Andrzejewska

**Tutor:** Prof. Katarzyna Derwich

**Introduction:** Gastrointestinal stromal tumours (GISTs) are very rare proliferation of the interstitial cells of Cajal. Approximately 170 cases of GISTs are reported in Poland yearly, yet this applies only to the adult population. It is estimated, however, that only less than 2% of GISTs occur in children. In paediatric population, they tend to occur more frequently in females and arise in stomach, being either wildtype or possessing SDH, SDHB or IGF-1R gene abnormalities.

**Case report:** We report currently 15-year-old female that presented with abdominal pain at the age of 10. Imaging diagnostics followed, revealing an unidentified tumour in stomach's area. The girl was qualified for its resection. Histopathologic diagnostics confirmed it was gastrointestinal stromal tumour. No additional treatment was administered. She was regularly monitored with multi-centre counselling. A year after, new soft tissue changes in the duodenum were described. Extended imaging (CT, MRI) was performed, not showing any signs of progression. However, PET-CT showed higher uptake yet in another localisation. In 2019, repeated radionuclear imaging revealed increasing metabolic uptake, while MRI a new lesion. Retrospective genetic tests were performed to assess the presence of any mutations that could contribute to neoplasm's development. KIT mutation in exons 13 and 17 was found, hence therapy with imatinib was proposed. To date, the girl is being treated with the medication and the disease progression seems to be contained.

**Conclusions:** Despite the fact GISTs are very rare in paediatric population, they should be taken into account whilst performing differential diagnosis of gastrointestinal tract tumours. It is important to implement multi-centre counselling and regular follow-up in order to provide the patient with the best possible care.

## **RHABDOMYOSARCOMA OF THE EAR PRESENTING WITH PERIPHERAL FACIAL NERVE PALSY –A CASE REPORT**

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**Presenting author:** Klaudia Kister

**Tutor:** MD PhD Joanna Nurzyńska-Flak

**Introduction:** Rhabdomyosarcoma is one of the most common sarcomas of childhood. Among tumors of the pediatric population, only neuroblastoma and nephroblastoma are diagnosed more frequently. Rhabdomyosarcoma rarely occurs in adults. 30% of tumors are located in the head and neck area, but localization in the ear and temporal bone are rare.

**Case report:** This article presents a case report of a 5-year-old girl who presented symptoms of occlusion of the left external auditory canal. No abnormalities were found on physical examination. The girl did not report any other complaints. The diagnosis was: the inflammation of the ear. Augmentin antibiotic therapy was started. During the treatment, peripheral paralysis of the left facial nerve occurred and the original symptoms did not resolve. The girl was referred to the neurology department for further diagnosis. Imaging examinations (MRI, CT) were performed and an abnormal mass in the examined area was found. Steroid therapy (Dexaven) was started without clinical improvement. At the same time, the patient was referred for biopsy of the lesion. The histopathological examination diagnosed embryonal rhabdomyosarcoma of the left ear. The patient was transferred to the Oncology Department. On physical examination, a gray-brown mass was found in the left ear canal closing the canal lumen, without pain symptoms. The diagnostics were expanded to include chest CT, scintigraphy, lumbar puncture and bone marrow punch biopsy, with no distant metastases found. Based on the results of the whole clinical picture, the patient was qualified for chemotherapy according to the CWS SoTiSaR program. The patient is currently undergoing preoperative chemotherapy in the Department of Oncology. In further treatment, surgery and radiotherapy are planned.

**Conclusions:** A developing neoplasm of the craniofacial region does not always present typical symptoms such as enlargement of regional lymph nodes or a visible tumor mass. The lack of response to antibiotic therapy of ear inflammation in a child with coexisting paralysis of the ipsilateral facial nerve should lead to widening the diagnostics in the direction of neoplastic diseases. The diagnosis of peripheral facial nerve palsy should also consider non-neurological causes. Due to the malignant nature of rhabdomyosarcoma, an early diagnosis provides a better prognosis and chance of cure.

## PRENATAL DIAGNOSIS OF RETROPERITONEAL TERATOMA - A CASE REPORT

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**Presenting author:** Jakub Laskowski

**Tutor:** MD PhD Joanna Nurzyńska-Flak

**Introduction:** Retroperitoneal teratoma is a rare tumor detected in children. Most often, it is diagnosed by the age of 1. The differential diagnosis includes neuroblastoma - the most commonly detected tumor of the retroperitoneal region at this age. The article presents the case of a 15-month-old girl. An ultrasonography (USG) scan performed in the third trimester of pregnancy revealed a pathological mass in the right kidney region. A CT scan of the abdomen done after birth confirmed the tumor's presence in the described area.

**Case Report:** The child was hospitalized in the Neonatal Pathology Department of the University Children's Hospital in Lublin, where oncological diagnostics was performed since the fourth day of life. MRI revealed a litho-fluidic focal lesion with polycyclic contours, 66x50x67 mm in size, located on the right side of the abdominal cavity adjacent to the right kidney, the surface of the visceral lobe of the liver and the pancreas. The lesion displaced the right kidney. Laboratory findings of abnormalities included high AFP, parameters: B-HCG, LDH, and uric acid were normal. Due to the tumor compression on the inferior vena cava, which caused rapid deterioration of the general condition, the child was qualified for urgent tumor resection in the 2nd week of life. The histopathological examination diagnosed: Immature Teratoma - Three-leaf Teratoma with multiple foci of the immature neuroepithelium (grade 3 by Norris) and immature mesenchymal elements. Postoperative follow-up abdominal ultrasound showed no significant changes, only elevated echogenicity of the right kidney and a small fluid area in the postoperative region. Additionally, an increased AFP level was found. Due to the young age and radical surgery, further treatment was discontinued, the child remained under strict oncological control - every 4 weeks, abdominal USG was performed, and AFP level was monitored. The following examinations showed a gradual increase of AFP level and a pathological change in the tumor locus, confirmed by MRI scan. At the age of 5 months, the described lesion was resected. Histopathological analysis confirmed the presence of Immature Teratoma. Treatment with chemotherapy based on TGM 95 program was started. A total of 4 blocks of VBP were administered. The treatment was completed at the age of 10 months. Currently, the girl is in complete oncological remission, 6 months after the end of the treatment. She remains under control of the Department of Pediatric Oncology, where periodically USG and MRI of the abdomen are performed, and AFP level is monitored.

**Conclusion:** A teratoma should be considered in the differential diagnosis of a retroperitoneal mass detected in the prenatal period. Detection of the tumor in the prenatal period enables immediate initiation of further diagnostics and treatment after birth, resulting in a better prognosis. Prenatal detection of fetal masses is becoming more common within the increasing use of ultrasonography.



## Left atrial myxoma mimicking severe mitral valve stenosis: A case report

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**Presenting author:** Gabrielė Jakuškaitė

**Tutor:** MD PhD Saulė Cyrolytė, Eglė Ereminienė,

**Introduction:** Primary cardiac tumors are rare and usually benign. Most of them are myxomas which tend to be located in the left atrium. Cardiac myxomas can remain asymptomatic for long periods of time. However, left atrium tumors may mimic symptoms of mitral valve stenosis.

**Case report:** A 37-year-old patient was admitted to hospital with the onset of severe dyspnea, productive cough, orthopnea, fever and general weakness. Physical examination revealed crackles in the right lower lung, blood pressure of 108/73 mmHg, heart rate of 120 bpm, 90% oxygen saturation on room air. Laboratory tests revealed increasing C-reactive protein levels (54,3 mg/l → 220 mg/l).

A chest X - ray showed increased lung attenuation pattern, peribronchial cuffing and infiltrations of S3-6 segments. A two-dimensional echocardiographic examination revealed a mobile heterogeneous 5,8 x 4,7 cm mass in the left atrium arising from interatrial septum that significantly stenosed the mitral valve orifice during diastole (pressure half time (PHT) - 273 ms, mitral valve area of PHT - 0,81 cm<sup>2</sup>, mean gradient – 9,4 mmHg). Bronchopneumonia and pulmonary edema were diagnosed. Pulmonary edema was a result of mitral valve stenosis caused by left atrium myxoma. Conservative treatment with antibacterial medication and diuretics was administered. Three weeks later, with a reduction in inflammatory parameters, the patient underwent resection of the mass under cardioplegia and cardiopulmonary bypass. Diagnosis of cardiac myxoma was confirmed histologically. The postoperative course of the patient was uneventful. Treatment with antibacterial medication, diuretics and beta blockers was continued in combination with physiotherapy.

**Conclusions:** The main cause of mitral valve stenosis is rheumatic fever. However, cardiac tumors, especially left atrium tumors, can mimic symptoms of mitral valve stenosis. Noninvasive cardiac imaging remains the main method for differential diagnosis with echocardiography being the most commonly used. Treatment of myxomas is surgical and has a great long-term prognosis.

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## RARE COURSE OF ACUTE LYMPHOBLASTIC LEUKEMIA – A CASE REPORT

Ewa Pustelnik

Medical University of Warsaw

**Presenting author:** Ewa Pustelnik

**Tutor:** MD PhD Magdalena Wołowicz

**Introduction:** Acute Lymphoblastic Leukemia (ALL) is the most common malignant tumor in children. It's clonal proliferation and expansion of immature lymphocytes. Treatment of ALL is based on multi-drug cycles of chemotherapy, which are associated with a high risk of side effects.

**Case report:** Hardly had the 3-year-old boy started the treatment of ALL when following symptoms appeared: general health deterioration, entanglement, increases of RR. Hypertension maintained despite antihypertensive drugs administration. Later that day the boy had an episode of a total seizure; diazepam and continuous infusion of phenobarbital were given, but without significant improvement. The patient was transferred to the Intense Care Unit (ICU) where renal parameters deteriorated and anuria occurred despite the stimulation with ethacrynic acid, mannitol and theophylline. Continuous Venovenous Hemodiafiltration (CVVHDF) was initiated. A myelogram on day 15 of treatment showed erythrophagocytosis. Taking into consideration the patient's blood results, the secondary hemophagocytic syndrome due to the leukemia was suspected. The concentration of soluble receptor for IL-2 was also raised. The boy met the criteria for HLH and etoposide was started. The patient was given antibiotics as prophylaxis of infections, but even so, he developed a pneumonia which caused a sudden cardiac arrest in the mechanism of obstruction. The patient was transferred to the ICU, and then, a tracheostomy was performed. During the next several weeks, the boy was in a serious condition, without contact; sometimes he directed his gaze into the light. An MRI revealed damage of white matter, ischemic changes and thrombosis of the sagittal sinus, left transverse and sigmoid sinus. He had another infection and a septic shock. A few weeks after that the boy demonstrated symptoms of cholestasis; not only did CT show gallbladder abscess but also inflammation in the wall of the rectus abdominis. The cholecystectomy was performed.

**Conclusion:** Treatment of ALL is multidisciplinary and complications may affect any organ or system. Our patient was discharged from the hospital with remission of ALL. To the present day he requires dialysis and physiotherapy.

## **A case report of spontaneous pneumocephalus in a 11-year-old boy.**

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SKN Neurochirurgii Dziecięcej WNMK SUM  
**Presenting author:** Aleksandra Jedlecka

**Tutor:** Prof. Marek Mandra

**Introduction:** Pneumocephalus is defined as an air or a gas in a cranial cavity. It is usually a complication of a trauma, brain surgery, infections or brain tumors. I present an unusual case of spontaneous pneumocephalus not directly caused by a brain tumor or a neurosurgical treatment.

**Case report:** A 11-year-old boy was urgently admitted to the neurosurgical ward because of pneumocephalus. He was complaining of a weakness of lower limbs lasting seven days, dizziness and vomiting. Performed encephalic MRI showed great amount of air in frontal horns of lateral ventricles and in basal cisterns, especially in the area of an enlarged sphenoidal sinus. Almost one and a half year ago the patient had a surgery because of the tumor in the left lateral ventricle with a hydrocephalus. Before the surgical treatment, the ventriculoperitoneal shunt was implanted. Subsequently, the tumor was removed without complications. The histopathological examination showed it was choroid plexus carcinoma. During tumor surgery, the attention was paid to the significant thinning of the cranial bones. The surgical treatment was supported with a chemotherapy and a radiotherapy. A month ago, the oncological treatment was finished. A control MRI did not show a recurrence of a brain tumor but revealed pneumocephalus. In order of pneumocephalus, a transsphenoidal duraplasty was performed with using synthetic materials. There were no complications after the duraplasty. The patient was discharged from hospital in good condition with persistent right-sided paresis on day 10.

**Conclusions:** The most likely cause of pneumocephalus was a fistula (a cavity) in the sphenoidal bone. Increased intracranial pressure for a long time and the significant thinning of the cranial bones may have caused a spontaneous pneumocephalus.

**From Palliation to cure. Pressed IntraPeritoneal Aerosol Chemotherapy as a method for peritoneal carcinomatosis in colorectal cancer.**

Dominika Hanusek, Julia Wojtowicz  
Collegium Medicum University of Warmia and Masuria

**Presenting author:** Dominika Hanusek

**Tutor:** MD Florian Fanget

**Introduction:** PIPAC (Pressured IntraPeritoneal Aerosol Chemotherapy) is a recent approach for delivering intraperitoneal chemotherapy in the treatment of unresectable peritoneal metastasis (PM) of digestive cancers. This is a valid option in synchronous or metachronous PM from gastric adenocarcinoma, colorectal, pancreatic, ovarian PM or peritoneal mesothelioma. This treatment is advocated for patients who are not candidates for curative cytoreductive surgery (CRS), without clinical or morphological responses or who present intolerance for systematic treatment, without distant metastases. This procedure is actually considered as a palliative intent and aims to prevent diffusion of PM.

**Case Report:** A 52-year-old woman presented abdominal pain and a positive faecal occult blood test with a CT scan which detected a lesion of the caecum. Colonoscopy with biopsies confirmed the diagnosis of a slightly differentiated adenocarcinoma with mucus-secreting cells. Carcinoembryonic antigen (CEA) was 9,4 ng/ml. A right hemicolectomy was performed. PM had been observed in the pelvis. Histopathological specimen was classed as pT4 N1 M1 without mutation in K-Ras and BRAF genes and with microsatellite stability phenotype. A postoperative chemotherapy composed of FOLFRINOX (5FU, irinotecan, oxaliplatin) and bevacizumab was introduced. Because of side effects, bevacizumab was replaced by cetuximab after 4 courses. A new exploratory laparoscopy revealed PM with a Sugarbaker Peritoneal Cancer Index (PCI) of 13/39. PM was assessed to be unresectable because of extensive lesions of small intestine. After multidisciplinary discussion, a treatment with adjunction of PIPAC was adopted. This patient underwent 3 PIPAC procedures with oxaliplatin 92mg/m<sup>2</sup> in 150 ml NaCl 0.9% during laparoscopy every 6 weeks. Follow-up biopsies objectives fibrosis of tumour cells. After 3 PIPAC, PCI decreased to 9/39 with disappearance of small bowel lesions and a complete cytoreduction (CRS) with HIPEC (Hyperthermic Intraperitoneal Chemotherapy) was performed with limited resections as pelvic peritonectomy, total hysterectomy, omentectomy, peritonectomy of diaphragmatic cupulae, cholecystectomy, parietal resections and omphalectomy.

**Conclusion:** In Literature, 14% of patients with initial unresectable PM who underwent consecutive PIPAC procedures become eligible to curative CRS + HIPEC, not only with gastric cancers, but also in colorectal, ovarian PM and peritoneal mesothelioma. Systemic chemotherapy must be associated. PIPAC is a safe procedure when performed in expert centre. In Literature, morbidity rate is range to 0 from 15%. In a recent series, overall complication was 4% without any mortality, suggesting a better selection of patients. Some authors described an increased overall survival with adjunction of PIPAC procedures compared to systemic chemotherapy alone. This case demonstrates that PIPAC may have a role in secondary curative treatment in PM of digestive cancers.

## **Lightning-fast killer - tumor lysis syndrome in relapsing anaplastic large cell lymphoma**

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**Tutor:** Prof. Mariusz Chabowski

**Introduction:** Tumor lysis syndrome comprises of a set of disorders that accompany the breakdown of cancer cells. Typically, it occurs after the initiation of chemotherapy in treatment of the patients with neoplasms of high proliferative activity and high sensitivity to the chemotherapeutic agents. Additional risk factors predisposing to tumor lysis syndrome, are: tumor size above 10cm, obstruction in urine outflow, dehydration, high uric acid concentration, abnormal kidney function and high activity of lactate dehydrogenase before the onset of treatment. The spontaneous appearance of this syndrome is rare, which unfortunately happened in the patient we describe.

**Case report:** A 24-year-old male patient, being treated at school age for anaplastic large cell lymphoma, was admitted to the surgical department for pain in the left hip and lymphoedema of the left lower limb. On admission, the patient had symptoms of an ongoing inflammatory process. On physical examination the abnormal mass in the mesogastrium and lower abdomen as well as lymph nodes in both groin, were palpable. After performing additional tests, such as CT and blood tests, a biopsy of the swollen lymph glands in the supraclavicular region (Daniels biopsy) was recommended. Histopathological examination showed the morphological picture of anaplastic large cell lymphoma. After about two weeks the patient was brought to the emergency department due to the deterioration of his general condition and the symptoms of upper gastrointestinal obstruction. On admission, the patient's condition was moderate with progression to severe. Examinations revealed the renal failure, high inflammatory markers, anemia, leukocytosis, hyponatremia, hyperuricemia. The imaging studies showed a pathological, disintegrating soft tissue mass of 135mmx90mmx110mm, infiltrating the iliopsoas muscle and the rectus abdominis muscle on the left side. The numerous conglomerates of pathological lymph nodes in the area of the neck, mediastinum, abdominal cavity, pelvis, inguinal pits and mesorectum were palpated. These lesions caused gastrointestinal obstruction, effusion into the pericardial sac and impaired urine outflow through the left ureter. Due to the symptoms of the tumor lysis syndrome, the treatment with methylprednisolone and rasburicase was applied in cooperation with the Department of Hematology at the Medical University in Wrocław. Despite treatment the patient's condition worsened and he died in the course of advanced disseminated neoplastic processes.

**Conclusion:** It is very important to follow up the patient after the oncological treatment even many years after its completion. The recurrence of the disease, which develops silently, and not diagnosed at an early stage, may lead to dissemination and to a rare, spontaneous tumor lysis syndrome.

## **Almost complete response after hypofractionated radiotherapy with hyperthermia in a patient with unresectable low- grade pelvic fibromyxoid sarcoma**

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**Presenting author:** Anna Maria Janik

**Tutor:** MD PhD Mateusz Spalek, Prof. Piotr Rutkowski, Maria Telejko

**Introduction:** The primary treatment for low-grade soft tissue sarcomas (STS) is tumor resection, in some situations combined with perioperative chemotherapy or radiotherapy (RT). However, low-grade STS seem to be chemo- and radioresistant. Thus, the management of locally advanced or unresectable disease is challenging. We believe that the addition hyperthermia (HT) to hypofractionated RT allow obtaining good local control with acceptable treatment toxicity (prospective phase II clinical trial SINDIR NCT03989596). The aim of the study was to present a case report from the aforementioned study of a patient with unresectable pelvic low-grade fibromyxoid sarcoma with almost complete response after RT+HT.

**Case report:** A 52- year old women was admitted to Maria Sklodowska-Curie National Research Institute of Oncology with a low-grade fibromyxoid sarcoma of pelvis. In magnetic resonance imaging (MRI) a 9 cm pelvic mass in contact with a right iliac bone was visible. The tumor was assessed as unresectable in the multidisciplinary team meeting. Due to the extent of the disease, anthracycline-based chemotherapy was proposed. She received three courses according to AI regimen (doxorubicin, ifosfamide), however, no satisfactory response has been achieved. Then participation in SINDR trial was proposed to the patient (December 2018). After obtaining an informed consent, she began the first part of RT+HT, namely 3.25 Gy per fraction to total dose 32.5 Gy + four deep HT (BSD-2000 hyperthermia system). The treatment tolerance was good, grade 2 intestinal and ski toxicity according to Common Terminology Criteria for Adverse Events v 4.0 was observed. After 6 weeks (February 2019), the next MRI revealed the tumor regression, however, only an attempt of very extensive surgery with permanent stoma was possible. Then it was decided to add a boost of RT+HT according to SINDIR protocol without surgery. She received 4 Gy per fraction to total dose of 16 Gy + two deep HT. CTC Grade 1 skin toxicity was noted. In September 2019 MRI showed significant tumor regression (4 cm size and fibrosis). In december 2019 a gradual regression of the tumor was observed. No late toxicity was noted.

**Conclusions:** The case shows that RT+HT may be an effective treatment in patients with locally advanced potentially chemoresistant STS. It provides a good local disease control with acceptable toxicity. The full results of SINDIR clinical trial are awaited.

## **An unusual case of progression of microglandular adenosis to invasive breast cancer**

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**Introduction:** Microglandular adenosis (MGA) is a benign proliferative lesion of the breast characterised by the absence of hormone receptors and HER2 ('so-called' triple-negative phenotype). It occurs as a thickening, palpable mass, but it can be also elusive at palpation. MGA can pose a diagnostic difficulty as morphologically it often mimics invasive carcinoma, but the probability of co-occurrence of MGA and breast carcinoma (BCa) is relatively low. Moreover, progression from MGA to BCa is rare. We describe here such an unusual case of a female patient diagnosed with microglandular adenosis, that progressed to invasive carcinoma of the left breast.

**Case report:** The 66-year-old female was admitted to the hospital with a palpable mass in the left breast. Laboratory tests showed no significant abnormalities apart from slightly decreased eosinophil and lymphocyte counts. Mammography detected two pathological masses – 7mm calcified nodule (BI-RADS 2) in the upper pole of the right breast and a 20mm calcified nodule (BI-RADS 5) in the retroareolar area of the left breast. Subsequent biopsy of the left breast confirmed a neoplastic origin of the tumour. Lymphoscintigraphy did not demonstrate metastases in sentinel lymph nodes. The patient underwent breast conserving surgery combined with a biopsy of the left sentinel lymph node. Microscopical image of the tumour was suggestive of carcinoma, however additional immunohistochemistry (IHC) revealed focal myoepithelial differentiation of the tumour glands. The histoarchitecture of the tumour was defined as tubular and cribriform with peripherally localized myoepithelial cells. In the epithelial component, IHC revealed positivity for: E- Cadherin and negativity for: Cytokeratin 5/6, HER2, estrogen receptor and progesterone receptor. Myoepithelial cells of the peripheral duct expressed S-100. IHC results for: 34B12, Calponin, Cytokeratin 18, p63 and SMA were equivocal. Microscopically, the tumour displayed a high level of atypia and evident neoplastic infiltration outbreaks. Thus, despite the expression of myoepithelial markers, the final diagnosis was triple-negative, basal-like invasive breast carcinoma with myoepithelial differentiation and associated with ductal carcinoma in situ component. In addition, the tumour showed an unusual, hardly ever reported feature i.e. focal signs of salivary type cancer differentiation originated most likely from microglandular adenosis. For 4 months of follow-up no recurrence has been observed.

**Conclusion:** The described case demonstrates that despite its benign nature, microglandular adenosis can progress to triple-negative breast carcinoma. According to a literature search, there are only several cases describing MGA progression to invasive breast cancer. Therefore, our case is unique. Moreover, it emphasizes the necessity of finding diagnostic strategies, that detect a MGA with a higher possibility of progression to IBC.



## Mysterious case of melanoma in cauda equina

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**Introduction:** Most melanomas originate from the skin and typically metastasizes to the skin, lungs, brain or liver. However, melanoma is a highly unpredictable tumour, as both primary and metastatic lesions can arise in several unusual locations such as heart or adrenal glands. To the best of our knowledge, in cauda equina, only 10 cases of primary and less than 15 of metastatic melanoma have been reported. We describe here a case of metastatic melanoma in cauda equina of unknown primary location.

**Case Report:** The 54-year-old female was admitted to the Department of Neurosurgery with a tumour located in the lumbar spine and paraspinal region. The patient presented with paralysis of the right lower limb and paresis of the left lower limb and had no past cancer history. The blood test showed leukocytosis with an increased number of neutrophils (88%), and no other overt abnormalities were detected. Magnetic Resonance Imaging (MRI) showed a pathological mass, approximately 139mm long, situated inside the spinal canal from segment Th12 to L4, compressing the cauda equina. Its extraspinal extension was 72x66x88mm. Based on neuroimaging findings neuroma was initially suspected and classified as type IIIb according to the Asazuma Classification (the intradural tumour extending through the intervertebral foramen). Total excision of the intraspinal mass via posterior approach (laminectomy) was performed. Postoperative imaging studies disclosed a residual mass in the extraspinal area.

Histopathology examination revealed a poorly differentiated and necrotic tumour consisting of dense sheets of small, atypical cells. In immunohistochemistry (IHC), the cells were positive for: vimentin, only focally for: Melan A, CD68 and CD56 and negative for: S100 (!), HMB-45, cytokeratin, EMA, synaptophysin, CD20, CD138, CD138, MUM1, LCA. Immunophenotyping allowed to exclude other neoplasms considered as a differential diagnosis such as carcinoma, glioma, meningioma, lymphoma, and myeloma, and led to the final diagnosis of the S100-negative metastatic melanoma of cauda equina. As, despite multiple diagnostic tests the patient was subjected to, the primary tumour was not found, the primary melanoma of cauda equina could not be ruled out. The patient was qualified for radiotherapy and chemotherapy and discharged in good condition.

**Conclusion:** The described case exposes the unpredictability of melanoma. Although the most likely locations for melanoma are the skin, atypical sites, as cauda equina, should also be kept in mind. Both primary melanoma and metastatic melanoma should always be considered in the differential diagnosis of the lesions in this location, which, for the most part, relies on the expertise by an experienced pathologist.

## Giant cell tumor of clivus masquerading as pituitary adenoma

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**Introduction:** Giant cell tumors (GCTs) are locally aggressive primary osteolytic neoplasms that usually involve epiphyseal regions of long bones. GCTs of the cranial base are rare accounting for 0.5 % of all GCTs, whose most common cranial locations are the sphenoid and temporal bones. Unlike GCTs, it is prolactin-secreting pituitary adenomas that are one of the most common lesions in the pituitary gland. However, the clinical management of GCTs is different and appears to be a somewhat untypical clinical issue.

**Case report:** A 26-year-old female presented to the neurosurgery department, complaining of headache, diplopia and oligomenorrhea lasting for months. On the first Magnetic Resonance Imaging (MRI), the picture resembled a pituitary microadenoma and the symptoms did not raise any particular concern.

Accordingly, conservative therapy was undertaken. The laboratory tests, in turn, were normal except for moderately elevated prolactin levels. After a few months the second MRI revealed a giant solid-cystic tumor of clivus, sella turcica and sphenoid sinus area. Also, the clinical symptoms were more advanced and spoke in favor of surgical treatment. The endoscopic transnasal transsphenoidal surgery (TNTS) was performed. Histopathology revealed GCT of the sphenoid bone, Campanacci 3 with secondary aneurysmal cyst. The H3F3A gene mutation was found and confirmed the diagnosis. There is no specific guideline for treatment of intracranial GCTs. The undertaken procedure, however, included: gross total resection, drilling the surrounding healthy bone, and adjuvant therapy with denosumab. Denosumab functions as RANKL, ie. an inhibitor approved for treatment of unresectable tumors. In case of subtotal gross resection, the possible recurrence is 55 %, but denosumab reduces this risk. The patient remains symptom free at almost two-year follow-up. Hence, this case report features a satisfactory outcome of the treatment with denosumab and TNTS, with no recurring GCTs after subtotal resection.

**Conclusion:** Based on the first pre-operative radiology, a provisional diagnosis of a prolactin-secreting pituitary adenoma seemed more probable than the one of GCT. GCT could only be confirmed in the histopathological and genetic examination. The transsphenoidal approach may be an appropriate surgical access to the sphenoid and clival bone GCT. The use of denosumab showed no recurrence in the case of our patient, therefore giving the prospect of suppressing the recurrence of GCT.

## **Incidental finding of adenocarcinoma in 64-year-old woman with total uterus prolapse**

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**Tutor:** Prof. Marcin Jóźwik

**Introduction:** Genital prolapse is very frequent in elderly women and multiparous. Pelvic organ prolapses are graded by the POP-Q System from 0 to 4. POP-Q 4 represent the most distal prolapse protrudes more than 2 cm, vaginal eversion is essentially complete. The risk of clinically relevant prolapse (POPQ stage 2 or higher) was found to increase with number of labors; one to three childbirths - 48.0%. However, the cases of total uterus prolapse combined with adenocarcinoma are rare. In this case study, the incidental finding of adenocarcinoma in 64-year-old woman with total uterus prolapse is presented.

**Case report:** A 64-year-old female who was suffering from prolapse of the uterus POP-Q 4, came to the ambulatory clinic with discomfort and spotting. During a gynecological examination showed a total uterus prolapse, decubitus 3x3 cm on the left wall of vagina, there was not active bleeding in the uterus cavity. In her past medical history, there were three natural labors (one multiple pregnancy). In 2008 the tension-free vaginal mesh anterior and posterior procedure was done because of POPQ 3. After operation she did not come to any gynecological appointment. Then the USG was done and revealed an endometrial polyp of 21x12 mm. She was referred to the ward for the purpose of diagnostic tests and hysteroscopy. After hysteroscopy and decubitus treatment she was discharged in overall good condition. The histopathology of the polyp revealed endometrioid adenocarcinoma G1. She was admitted to the ward again in case of surgical treatment. The known risk factors of endometrial adenocarcinoma in our patient were obesity (BMI 30,4 kg/m<sup>2</sup>) and hypertension. Before the operation, the tomography and the USG were done, there were no lesion in pelvis, there were lesions of fibrosis in the bases of the lungs after tuberculosis and coronavirus infections. Blood tests results were in optimal ranges. The radical hysterectomy with adnexal removal and pelvic lymphadenectomy was performed. The fixation of vaginal vault to the round ligament of uterus was done. Patient was discharged from the hospital in good condition. Histopathological examination of the body of uterus revealed endometrioid adenocarcinoma G1, with < 50% myometrial invasion.

**Conclusion:** Adenocarcinoma in patient with genital prolapse is uncommon. The regular medical control is essential and protects from invasive stadium of cancer.

## Histopathological spectrum of mixed-phenotype acute leukaemia (MPAL)– a case series

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**Introduction:** According to the WHO 2016 classification, mixed-phenotype acute leukaemias [MPAL] belong to acute leukaemias of ambiguous lineage that have blasts that express antigens of more than one lineage. MPALs are rare entities which comprise 4% of all acute leukaemia cases in both children and adults. Due to its rarity and variable presentation it poses a daunting challenge to the pathologists and clinicians. Here, we present our institutional experience with a series of four cases of MPAL.

**Case Report:** Mean age of patients included in the report was 74 (ranged from 64 to 82). All patients were admitted to the WWCOiT (Wojewódzkie Wielospecjalistyczne Centrum Onkologii i Traumatologii im. Mikołaja Kopernika) in Łódź with recently detected pancytopenia in a complete blood count. One patient has already identified genetic aberration such as del20q+ and trisomy 19. Because of suspicion of myelodysplastic syndrome, trephine biopsies of bone marrow were performed, which in each case, showed features of bone marrow hypoplasia. Percentage of blasts in bone marrow ranged from 8 to 35 %. Further analyses by immunohistochemistry using a large panel of markers showed: in two cases, co-existence of subsets expressing MPO (myeloid component), CD3, CD99 (T cell component), CD20 (B cell component) and CD123, CD138 (plasmacytoid component) and, in two others, subsets positive for CD117 (myeloid component) and CD99 (T cell component). In all cases, populations of blasts positive for CD34 were revealed but no B cell or plasmacytoid components were found. By flow cytometry, dominance of CD4-positive over CD8-positive populations, presence of TdT-positive and absence of CD56 cells populations in 20% of bone marrow cells were revealed. However, ambiguity of immunophenotyping did not allow to differentiate between MPAL and other entities of similar presentation (acute myeloid leukaemia, myelodysplastic syndrome, B lymphoblastic leukaemia) and no definite final diagnosis could be offered. All patients with a tentative diagnosis of co-existence of two entities were referred to the Department of Haematology for further molecular studies and treatment.

**Conclusion:** The presented series of four MPAL cases illustrates diagnostic difficulties pathologists and physicians may encounter in their everyday practice. Deceptively unremarkable clinical presentation may be underlined by hematologic entities of ambiguous aetiology and complex/overlapping molecular subtypes or phases, whose definitive diagnosis is extremely challenging. Our report highlights an unmet need for diagnostic guidelines in MPAL. In addition, better understanding of the molecular landscape of MPAL will assist its differentiation with other mimicking entities, thus enabling appropriate and effective clinical decision-making.

## Rare presentation of Primary Pulmonary Hodgkin's Lymphoma - case report

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**Introduction:** Primary pulmonary Hodgkin's lymphoma (PPHL) arises from the lymphoid tissue of the alveolar mucosa or peribronchial lymph nodes. PPHL is very rare and represents only 1.5-2.4% of all cases of primary pulmonary lymphoma. Due to the nonspecific symptoms and very low incidence, identification of PPHL is difficult and its diagnosis frequently overlooked. Here we present a case of PPHL mimicking granulomatosis associated with polyangiitis which posed a formidable diagnostic challenge.

**Case report:** A 53 year old female presented with non-specific symptoms such as weakness, peripheral oedema, dry cough and an ulceration of the nasal cavity. The patient has been previously treated for granulomatosis associated with polyangiitis with corticosteroids. Blood tests revealed elevated C-reactive protein level and white blood cell count with accompanying neutrophilia and lymphopenia. Due to lack of response to treatment, the immunosuppressants were discontinued. The patient presented then with low-grade fever and itchy erythematous rash. Bronchial brush biopsy, bronchial washing and mediastinal lymph node biopsy were conducted and revealed no signs of atypia. Similarly, no atypia was found in the biopsy of mucosal ulceration of the nasal cavity. Histopathological examination of the left lung biopsy showed an inflammation with no granulomas or necrosis which excluded the suspected granulomatosis with associated polyangiitis. Computed tomography scan showed an infiltrating mass in the left lung. After several inconclusive both cytological and histopathological biopsies, a biopsy of mediastinum revealed a fragment of fibrotic lung tissue with nodules containing pyknotic Hodgkin-Reed-Sternberg cells. Together with routine immunophenotyping, the final diagnosis of classical Hodgkin lymphoma, nodular sclerosis type was made. Additionally, PET scan did not reveal any metastatic spread. Patient was referred to the Hematologic Department for further treatment. **Conclusion:** Here we presented an exceptional case of PPHL which involved a thorough diagnostic workup by a panel of clinicians, radiologists and pathologists. The presented case may arouse awareness of complexity of PPHL, diagnosis of which, in some cases, may require a particularly close collaboration between clinicians and pathologists.

## **An unusual coincidence of ovarian leiomyosarcoma and adult granulosa cell tumour – case report**

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**Introduction:** Ovarian leiomyosarcoma is an exceptionally rare neoplasm with less than 70 cases reported in the literature. Because of its low incidence, and hence lack of management recommendations, it poses a serious both diagnostic and therapeutic dilemma. Here, we report a unique variant of this entity - ovarian leiomyosarcoma with coexisting adult granulosa cell tumour.

**Case report:** A 55-year-old female was referred to an oncological surgery ward with radiologically suspected metastatic ovarian cancer. Panhysterectomy, omentectomy, appendectomy and lymphadenectomy of the right and left iliac lymph nodes were performed. Macroscopic evaluation showed a tumour involving left adnexes. The tumour size was 22x18x12 cm. Macroscopically, it appeared as a cystic and solid mass with papilla on its surface, in addition to which, an involvement of omentum, the Douglas pouch and parietal peritoneum as well as perimetrium were also present. The histopathological evaluation revealed areas of an adult granulosa cell tumour with a coexisting undifferentiated component, immunophenotyping of which showed positivity for: desmin, CD99, CKAE3 and negativity for: CD15, CD34, D2-40, CK5/6, CK20, TTF1, S100, mucycarmin, inhibin, SMA, CKAE1, WT1, CK7, ER. The final diagnosis of ovarian leiomyosarcoma with adult granulosa cell tumour was made based on high immunoreactivity for desmin and cytokeratins with a concomitant high mitotic index and tumour cell necrosis. According to the FIGO 2014 staging system, the tumour was classified as stage IIIC.

**Conclusions:** Here we present an extremely rare case of coexistence of the leiomyosarcoma with an adult granulosa cell. The natural history of this ovarian tumour i.e. the sequence of development of its two components is unknown, which precludes prognostication of its course and outcome.

**CASE STUDY: SURGERY 1**

**COORDINATORS:** MICHAŁ KUBIAK, MARTYNA MARTKA

**JURY:**

MD PhD Marcin Włodarczyk

MD PhD Marzena Mielczarek

## **Percutaneous coronary intervention of a highly calcified lesion supported with optical coherence tomography**

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**Tutor:** MD Oscar Rakotoarison

**Introduction:** Percutaneous coronary intervention (PCI) is a procedure used to treat narrowing of coronary arteries. There are still some cases where an adequate effect is difficult to achieve.

**Case Report:** A 66-year-old male was admitted to hospital due to non-ST elevation myocardial infarction. He had a history of arterial hypertension and nicotine use. Patient reported retrosternal pain radiating to the left arm. Coronary angiography showed calcified lesion in proximal and complete occlusion in the medial part of the right coronary artery. 'Ad hoc' performed PCI only returned blood flow. Due to a highly calcified lesion, full expansion of the balloon catheter was impossible to achieve. The patient was asymptomatic and hemodynamically stable, so PCI with rotational atherectomy was scheduled. Procedure was performed via left radial approach. Several runs at 160000 rpm were made using a 1.5-mm Rotablator burr (Boston Scientific). Subsequently, optical coherence tomography (OCT) using Dragonfly Optis (Abbott) probe showed 360-degree calcium with a maximal thickness of 1.25-mm and length of 30-mm. Then operators performed unsuccessful inflations using a non-compliant balloon catheter (20 atm). Afterwards, three runs with 2-mm burr at 150000 rpm were performed, but a non-compliant balloon (30 atm) was still unexpanded. At last, full expansion was achieved using very high-pressure OPN non-compliant balloon catheter (SIS MEDICAL AG) at 36 atm. OCT performed before stent implantation showed some calcium cracks. Finally, a 3.5/48-mm drug-eluting stent was implanted and an adequate angiographic result was confirmed by imaging. The hospitalization was uneventful.

**Conclusion:** The presented case indicates that treatment of highly calcified coronary lesions may require several combined methods. Calcium cracks allow full expansion of a stent. OCT-guidance during a complex PCI is a helpful tool, determining the anatomy of a lesion, therefore allowing operators to choose an adequate method of proceeding and obtaining precise angiographic results.



## Subclavian Artery Cannulation Repair Using A Percutaneous Closure Device (AngioSeal)

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**Introduction:** Central Venous Catheter (CVC) is a catheter that is widely used in anaesthesiology and has many indications, such as vasopressor drug administration, renal replacement therapy or the delivery of large amounts of intravenous fluids. It is usually placed into the internal jugular or the subclavian vein. As many surgical and cardiac operations carry a risk of massive bleeding leading to a low-volume shock, it is necessary for patients undergoing those operations to have CVC. Nevertheless, its administration can also lead to complications. The most common are pneumothorax, hematoma and arterial puncture. Even though the last is quite frequent (2.9%), arterial cannulation is much less common (0.2%).

**Case Report:** The patient was a 90-year-old female after cardiovascular surgery due to type A aortic dissection. After the operation, CVC was planned to be inserted into the right subclavian vein under control of ultrasounds. Control chest X-ray revealed that CVC was introduced into the right subclavian artery instead. The misplacement of CVC was further confirmed by echocardiography. The catheter was not visible in the lumen of the venous vessels. It passed through the soft tissues of the subclavian region, went medially along the anterior edge of the subclavian artery, then entered into the lumen of the subclavian artery in its proximal segment. It passed further to the brachiocephalic trunk and ascending aorta. The end of the catheter was visible in the lumen of the vascular prosthesis in ascending aorta. Angiography was conducted to remove the misplaced catheter. It confirmed arterial placement of CVC. The tip of the CVC was visualised in ascending aorta. The extraction of CVC from the right subclavian artery posed a risk of bleeding. Therefore, the medical team decided to close the site of CVC entry into the artery using a percutaneous closure device (Angio-Seal® Vascular Closure Device). This instrument is frequently used to close the femoral arterial puncture site after angiography procedures. It uses haemostatic collagen sponge along with suture (both parts biodissolvable) to close the vessel injection site. The attempt to close the injection site in the right subclavian artery was successful. No bleeding or other complications were observed after the procedure.

**Conclusion:** Malposition of CVC into a subclavian artery may be a serious complication of a CVC insertion. Therefore, methods of treatment of this problem should be considered. This method of management of CVC misplacement is either a surgical or percutaneous intervention, the latter technique being less invasive. AngioSeal is an example of a percutaneous intervention which appears to be an effective and safe way of treatment of the subclavian artery puncture. However, this device is devoted specifically for the femoral artery, so care must be taken while using it on the subclavian artery. Moreover, the control X-ray should not be omitted as it can reveal serious complications.

## Arterial Haemorrhage after Cardiac Resynchronisation Therapy Defibrillator Implantation

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**Tutor:** MD PhD Maciej Grymuza

**Introduction:** Heart failure (HF) is a fatal and life threatening condition. For this reason, medications become redundant and invasive procedures to implant electronic devices, like cardiac resynchronization therapy defibrillator (CRT-D), become necessary in most severe cases. Purpose of CRT implantation is to correct the irregularity in intra-cardiac electricity conduction and as a result enhancement of muscle contractility and improvement of blood flow.

**Case report:** A 69 year-old patient was admitted to have a CRT-D implanted. His medical history consisted of myocardial infarction in 1997 and 2003, coronary artery bypass graft in 2004, percutaneous coronary intervention of the left circumflex artery in 2010, hypertension, diabetes mellitus, atrial fibrillation (AF) with left bundle branch block and NYHA II HF. The patient takes rivaroxaban for AF, which was stopped 24 hours before the implantation. Two hours after implantation, the patient reported swelling and pulsating pain in the left subclavical region. Physical examination showed the patient to be pale, diaphoretic with blood pressure of 85/59; therefore he was in shock. Complete blood count and a CT angiogram revealed a haemorrhage in the costocervical trunk, which branches off the subclavian artery, formed a haematoma. For management, angiography as conducted for stent graft implantation, and 3 units of blood transfusion was given. The next day, CT revealed no active bleeding, therefore clopidogrel was given for the stent. Four days later, rivaroxaban was resumed. Additionally, antibiotics were given as prevention for device infection. The further clinical course was uneventful.

**Conclusion:** Venous bleeding can occur during cannulation whilst implanting a CRT-D, however, arterial bleeding is extremely rare. Ultimately, rather than discharging patients on the same day of CRT-D implantation, they should be monitored for a few days after. This case highlights the vigilance and precautions that need to be taken to prevent these fatalities.

## Endovascular treatment of thoracoabdominal aortic aneurysm in Marfan syndrome

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**Introduction:** Marfan syndrome (MFS) is an autosomal dominant connective tissue disease causing mutation in fibrillin 1, which is one of the main proteins of the extracellular matrix. Thus has influence on regulation of elastogenesis and bioavailability of transforming growth factor. The main symptoms of the MFS include aneurysm, dilation of the aorta as well as morphological features: long limbs, scoliosis, malformed rib cage. Regardless of MFS manifestation, the main causes of MFS patient's death are cardiovascular sequels primarily thoracoabdominal aortic aneurysm (TAAA). Staged endovascular treatment of TAAA is preferred in patients with MFS as prevention from spinal cord ischemia (SCI) which may occur in such extensive aortic surgery.

**Case report:** A 40-year-old patient was admitted to our hospital due to acute abdominal pain. Examination revealed a pulsing bulge in the umbilical region. A patient suffered from MFS aortic insufficiency, mitral valve prolapse, and arterial hypertension. A pre-operative angio-CT scan revealed thoracoabdominal aortic dissection. Aortic diameter was 66 mm and increased by 10 mm in 6 months. In addition, it was very symptomatic, which was a direct indication for a procedure. The CT scan also presented an occlusion of the left subclavian artery. A cardiac surgeon discarded him from the classical surgical procedure as the risk was considered to be too high. The first stage of the treatment involved stent-graft implantation into the thoracoabdominal aorta with branches to the left iliac artery, left and kidney arteries, superior mesenteric artery, and coeliac artery. The further implantation to the right iliac artery was held off and planned for the next hospitalization. The patient was discharged from the hospital in a good general condition.

**Discussion:** The SCI incidence in extensive endovascular procedures is significantly high, so it is important to develop additional SCI prevention methods. One of the solutions is a staged procedure which is preferred in patients with MFS as it is important not to close intercostal and lumbar arteries in a short time as the blood supply of the spinal cord is very limited. This method allows gradual change in spinal cord vascularization.

## **The innovation in leadless stimulation: Micra AV implantation in a patient after cardiac device-related infective endocarditis**

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**Tutor:** MD PhD Ewa Jędrzejczyk-Patej, Prof. Beata Średniawa

**Introduction:** In early 2020 Food and Drug Administration (FDA) approved Micra AV - a new type of leadless pacemaker with atrioventricular synchrony to treat patients with atrio-ventricular (AV) blocks. We describe a case of a patient who was implanted with Micra AV pacemaker after infective endocarditis.

**Case report:** A 38-year-old female patient was admitted to the clinic due to the 29-seconds event of a complete AV block without an escape rhythm and was implanted with a dual chamber pacemaker without any complications. After several months she was admitted again with suspected ventricular perforation by the pacemaker electrode and underwent a replacement procedure of both pacemaker's electrodes. Nevertheless, one week later the patient developed a fever with significantly elevated inflammatory markers. The blood cultures were negative but in the transesophageal echocardiography features of electrode related infective endocarditis were observed. Empirical antibiotic therapy was administered, and the device was removed. The Heart Team qualified the patient for the implantation of a Micra™ AV leadless pacemaker. The procedure was performed without any complications and the device was implanted to the right ventricle. All parameters were correct, and the patient was discharged.

**Conclusion:** Micra AV may be a feasible and safe option for young patients with paroxysmal AV block after device-related complications.

## **Intramedullary spinal cord abscess - a case report**

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**Tutor:** Prof. Maciej Radek, MD Jakub Jankowski, MD Maciej Błaszczyk

**Introduction:** Spinal cord infections comprise intramedullary spinal cord abscess (ISCA) with meningitis, epidural abscess, as well as subdural abscess. Here we present a case report of ISCA patient. ISCA remains an extremely rare pathological entity of the central nervous system caused by bacterial infections (especially staphylococci- and streptococci-induced ones). Symptoms depend on the size and location of the abscess and consist of progressive motor and sensory deficits.

**Case report:** A 65-year-old male was admitted to the Department of Neurosurgery with progressive lower extremities paresis, especially on the left side, reduced superficial sensation on the left leg, reduced lower limbs reflexes, paraparetic gait and thoracic pain. Symptoms of paresis had been worsening for several months. Laboratory tests showed an elevated CRP level. The patient had no symptoms of general neuroinfection. Medical history revealed the L2/L3 discectomy that was performed five years earlier and aortic valve prosthesis implantation fifteen years previously.

Magnetic Resonance Imaging of the spinal cord revealed an intramedullary solid-cystic tumor at the Th4 level. After obtaining the patient's consent to the operation, laminectomy at the Th3-Th5 level was performed and dural sack was opened. Following myelotomy, purulent content was evacuated and taken for culture. In the microbiological testing of the abscess, *Staphylococcus aureus* MRSA and *Staphylococcus coagulase-negative* were detected. According to the antibiogram, targeted vancomycin therapy was implemented. In the postoperative course, the subsidence of paresis and decrease in inflammatory parameters in the laboratory tests were observed. At one-year follow-up, no deterioration of the patient's neurological status was observed.

**Conclusions:** The diagnosis of ISCA remains a challenge. Moreover, the progressive character of its symptoms significantly impairs the patient's quality of life. The appropriate management linking the neuroimaging techniques with adequate surgical treatment combined with targeted pharmacotherapy remains the key to ISCA treatment.

**When it is not glaucoma – a case of misdiagnosed glaucoma.**

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**Presenting author:** Marta Łukomska

**Tutor:** MD PhD Wojciech Adamski

**Introduction:** Glaucoma is a term for a group of eye diseases that has a common feature of progressive neuropathy of the optic nerve, that if left untreated, may lead to irreversible blindness. The main risk factor for its development is increased intraocular pressure (IOP). To diagnose glaucoma, it is necessary to perform the following tests: IOP assessment, gonioscopy, assessment of the optic nerve disc (characteristic changes in the image of the optic disc), perimetry (visual field defects), in recent years, the assessment of corneal thickness has become an important element in the diagnosis of patients with glaucoma. OCT (Optical coherence tomography) RNFL (Retinal Nerve Fiber Layer), the analysis of the thickness of the nerve fibers of the retina, includes a circular scan of the retina around the disc n.II. The thickness of the retina is compared with the mean values in a similar populace. Myodesopsia is a condition involving the accumulation of various substances of any degree of mobility, transparency, density, thickness, found in the vitreous body of the eye. They can arise in the prenatal period, as well as as a result of degenerative changes in the eye's retina and the vitreous. Myodesopsia can affect the results of OCT scans. Vitreolysis is a minimally invasive laser treatment involving the evaporation of vitreous floaters or their fragmentation and displacement. Vitreolysis treatments are performed using a specially designed Nd: YAG laser

**Case Report:** The patient presented with several ophthalmic problems such as deterioration of near vision, history of glaucoma (takes drozolamide+timolol twice a day), and vitreous floaters.

In the course of diagnostics, RNFL OCT was performed with a borderline result, IOP in the right eye: 14 mmHg, in the left eye 15 mmHg, CCT (Central corneal thickness) : 600  $\mu\text{m}$ .

YAG vitreolysis of the left eye was performed, which resulted in the disappearance of floaters and an improvement in the thickness of the retinal nerve fibers in the OCT RNFL measurement. Glaucoma therapy was discontinued and a visual field test was performed showing no defects.

**Conclusion:** The patient was misdiagnosed with glaucoma based on an elevated IOP measurement that was not adjusted for the central corneal thickness and on a misread OCT RNFL examination.

## Spectacle-free eyes after combined procedures for young patient with cataracts and very high myopia

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**Tutor:** MD Andrzej Dmitriew,

**Introduction:** Refractive eye surgery is used to improve the refractive state of the eye and eliminate dependency on contact lenses or spectacles. It can include various methods of surgical remodelling of the cornea, lens implantation or replacement.

**Case report:** Our 30 years old, female patient had high myopia of both eyes. Autorefractometry (AR) without correction showed an unmeasurable refractive error in the right eye (probably  $-25$ ) and  $-17,25/-1,25/160$  in the left eye. Posterior subscapular cataract was observed in the slit lamp examination of both eyes. The fundus examination showed myopic peripheral degenerations. Patient had the minimal available power of trifocal lens implantation in separate operations. During the check-up visit AR showed  $-4,25/-1,25/177$  on right eye and  $-1,25/-0,25/144$  on left eye. It was decided to remove the refractive residual defect with laser vision correction. Epi Bowman Keratomileusis (EBK)-surface method in which the epithelium is gently removed from the surface of the cornea- was performed. The cornea was clean and conjunctival irritation was observed. In AR we could observed  $+0,5/-0,25/172$  on right eye and  $+0,5/-0,5/169$  on left eye. She stays spectacle free for both near and distance. Because the woman became pregnant after the surgery the check-up visit in the 32-33 week of pregnancy was recommended. Currently, there were no contraindications for natural childbirth.

**Conclusions:** The trifocal lens is an effective and convenient method of correcting vision defects, which relieves the patient from wearing contact lenses. Residual vision impairment can be corrected through the use of a laser vision correction. Combination of different methods allows us in many situations to correct refractive errors between  $-25$  and  $+12$  diopters.

## **A pyocele of a frontal sinus as a complication of a chronic sinusitis - a case report**

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**Presenting author:** Kacper Dykas

**Tutor:** MD Kamila Stolcman, MD PhD Joanna Szaleniec, MD PhD Patryk Hartwich

**Introduction:** A pyocele is a complication of sinusitis with its origin in an obstruction of the ostium of a sinus due to inflammation, trauma or postoperative lesions resulting in an accumulation of pus. It can be found in every paranasal sinus, but mainly affects the frontal sinus. Accumulation of secretions causes the increase of pressure which can lead to destruction of the bony wall of the sinus and to complications resulting from spreading of the infection, e.g. brain abscess, meningitis. Common clinical manifestations of the pyocele include cystic swelling in the forehead, proptosis and displacement of the eyeball forward, downward and laterally. Moreover, patients may complain of headache or diplopia. Imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) show advancement of the disease and are crucial to plan appropriate therapy. The therapeutic options include a frontoethmoidectomy and a drainage with the use of open or endoscopic approaches.

**Case report:** This paper presents the case of a 68-year-old woman who was admitted to the Otolaryngology Clinical Department of the University Hospital in Krakow due to pyocele of the right frontal sinus with penetration to the anterior cranial fossa and the destruction of the superior medial wall of the right orbit. Two years before, the patient was diagnosed with chronic sinusitis and underwent a specialistic surgery (ESS). On admission, the patient complained of an unpleasant smell and pus-like, thick discharge from the right nasal cavity, the oedema of eyelids of the right eye and the soreness on palpation in the location of the tumour. The CT scan of paranasal sinuses was performed and revealed opacification of both frontal sinuses with inflammatory lesions and erosions of anterior, posterior and inferior walls of right frontal sinus. The inflammation infiltrated the subcutaneous tissue of the right eye orbit. Moreover, the thickening of mucosa in the right maxillary sinus and in ethmoid cells was observed. The patient was consulted by neurosurgeons, ENT specialists and qualified to endoscopic sinus surgery. The procedure included the drainage and irrigation of the frontal sinuses. In addition, the tissue samples for histological examination and the swab of the purulent material for bacteriological examination were collected. After surgery rapid resolution of symptoms was observed.

**Conclusions:** This case illustrates an example of the pyocele of frontal sinus. It is important to remember that early diagnosis and treatment of this condition prevents severe complications, for instance brain abscess, subdural empyema and the risk of vision loss. Fortunately, the available endoscopic surgical procedures enable to restore the physiological sinuses' function.



## Nasal mucosal malignant melanoma - case report

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**Presenting author:** Patrycja Rzesoś

**Tutor:** MD PhD Joanna Jackowska

**Introduction:** We present a case of a mucosal nasal malignant melanoma relapse after five years from surgical treatment.

**Case report:** A 50-year-old man with a significant medical history presented with an 8-week history of rapidly progressing left nasal cavity obstruction and epistaxis in January, 2021.

The patient was initially diagnosed with a poorly differentiated glandular carcinoma of the left nasal cavity in March, 2016, and underwent a complete excision of the lesion without delay. Postoperative histopathological examination was conducted and the proper diagnosis of a mucosal nasal malignant melanoma was made. No metastases were visualized in imaging studies. After the procedure, the patient has been under the constant care of the ENT clinic. Since three years after the surgery, the follow-up visits took place once every six months.

Currently, clinical examination revealed an extensive loss of the nasal septum and a large mass filling the left nasal cavity perforating through the septum to the right nasal cavity. Due to the clinical picture, the biopsy was performed and the histopathological examination and immunohistochemical analysis showed mucosal nasal malignant melanoma local relapse. There were no metastases demonstrated in the computed tomography. Reoperation was conducted in February 2021.

**Conclusion:** Mucosal nasal malignant melanoma is a rare neoplasm requiring early diagnosis, immediate surgical treatment and continuous follow-up.

**Primary mandibular malignant PEComa (perivascular epithelioid cell tumor)  
– a unique case report**

Luka Matanovic

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**Tutor:** MD Dinko Leovic

**Introduction:** PEComas or perivascular epithelioid cell tumors are a very rare family of mesenchymal tumors, that are defined by the presence of PEC cells that coexpress muscle and melanocytic markers.

**Case Report:** A 69-year-old patient presented with a large mass on the right side of his face, that has been growing rapidly for the past month. He was also complaining about difficulties with swallowing. Few years ago, patient surgically removed prostate adenoma and was also diagnosed with paroxysmal supraventricular tachycardia. On examination, a large mass localized in the area of corpus, angulus and ramus of the mandibular bone could be palpated. The mass has progressed intraorally and retromollary, being hard in consistency and painful on touch. Diagnostic MSCT revealed a large tumor (47x33x39mm) infiltrating the mandibular bone and partially destructing it, with no muscle or lymph node infiltration. Patient was addressed for surgery and two preoperative biopsies were taken, but no definitive pathohistological diagnosis was made. After the surgical removal of the tumor, the intraoperative material was sent for PHD in specialized institution (Nijmegen, Netherland) where primary malignant PEComa was diagnosed. Patient underwent another, more radical operation where segmental resection and reconstruction of mandibula with a free fibula flap was performed. On the follow-up, 25 months after the surgery, PET-CT revealed suspicious intrapulmonal mass, a possible metastasis so chemo- and radiotherapy have been administered. In the end patient died from agranulocytosis caused by chemo- and radiotherapy.

**Conclusion:** To our knowledge this is only the second ever described patient with primary mandibular PEComa in the literature and first case in Croatia. Because of the rare incidence of these tumors, there are still many unknowns and we believe our case report can help in better understanding of these tumors. Surgery is still the golden standard in therapy of these patients."

## Extramedullary Schwannoma of the Cervical Spine: A Case Report

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**Presenting author:** Redwan Jabbar

**Tutor:** Prof Maciej Radek

**Introduction:** Upper cervical schwannoma arising from a peripheral nerve sheath is rare and belongs to benign tumors that is typically slow-growing and asymptomatic for a long time. Pre-operative diagnosis is challenging as clinical examination is not so effective in definitive diagnosis, therefore is confirmed by histopathological evaluation. It predominantly occurs in patients in their 4th or 5th decades of life; total surgical excision is the treatment of choice for this kind of tumor.

**Case report:** We report a 41-year-old male who presented with a slow growing, retropharyngeal paravertebral mass on the right side of his neck. He reported a history of sore-throat, dizziness and difficulty in swallowing. On clinical examination, the tumor was palpable and firm in consistency, tender and non-pulsatile starting from C2 to C4. There was no significant past medical history, motor weakness, sensory deficits or pathological reflexes. Computed tomography revealed a well-defined paraspinal pathological mass with erosion extending to the transverse processes and part of vertebra bodies, and with widening of their intervertebral foramina on C2 to C4. Encapsulated extradural mass penetrating to the spinal canal and partial destructive invasion to intervertebral foramen at the C2 to C3 anterolaterally with widening of their foramen that was shown on magnetic resonance imaging. The tumor also compressed the larynx, pharynx, trachea and soft parts of the neck, without any signs of infiltration.

Definitive surgery was performed through transcervical approach procedure with longitudinal incision from C2 to C6 along with the SCM muscle. The jugular vein and trachea-esophagus were displaced laterally and medially, respectively, by retractor. Microscopically, a firm and well-capsulated mass was seen along C2 to C4, which was carefully evacuated in fragments utilizing ultrasonic surgical aspirator (CUSA). The mass was fully dissected from the nerve roots and surrounding tissues. The right vertebral artery was compressed and displaced posteriorly to the transverse process, with slight narrowing its lumen by the tumor. The vertebral artery was identified at the level of C5 and controlled during the tumor resection. Histopathological findings confirmed a benign schwannoma with proliferation of Schwann cell and chromatin, also Anthony type A and B patterns were found with spindle cells. The patient's postoperative course was uneventful and he was discharged from the hospital.

**Discussion:** Schwannoma are slow growing, encapsulated and lobulated tumors arising from the peripheral cells sited in the peripheral nerve root sheath. The differential diagnosis must be considered in patients with cervical paravertebral mass. Extradural extramedullary schwannomas are nonaggressive and can be safely removed by microsurgical techniques. Total resection remains the treatment of choice for these tumors as good clinical outcomes may be achieved with minimal risks.

## **Lung retransplantation as a treatment of end-stage graft dysfunction.**

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**Presenting author:** Monika Okienica

**Tutor:** MD PhD Marek Ochman

**Introduction:** Lung transplantation (LTx) is a life-saving treatment for selected patients with end-stage lung diseases. Nevertheless long-term outcomes depend on graft function. Major cause of lung dysfunction after LTx is bronchiolitis obliterans syndrome (BOS). By clinical definition it is a progressive and irreversible decline in forced expiratory volume in the first second of respiration (FEV-1).

**Case report:** Case report describes a 21-old male patient suffering from cystic fibrosis (CF). The patient underwent lung retransplantation (RLTx) due to end-stage BOS. The patient's clinical condition began to deteriorate 3 years after LTx. A significant decrease of more than 1l in FEV1 value (reaching 1,01l; 23%) required thorough diagnostics. A transbronchial biopsy was performed. It showed indirect features of gastroesophageal reflux disease (GERD), which was confirmed by gastroscopic examination. The patient was qualified for fundoplication treatment. However, 3 months after surgery, the patient's condition deteriorated further. The test results were as follows: FEV1: 0,38l (9%), six minute walk test (6MWT): 173m, the test was discontinued after 2 minutes due to severe dyspnea and desaturation up to 75%. Lung retransplantation remained the only viable treatment option for this patient. In the first 3 months after surgery spirometry parameters significantly increased: FEV-1: 2,38 l (54%). In 6MWT, the patient reached a distance of 400m.

**Conclusions:** In most cases, BOS progression leads to the failure of transplanted lungs. RLTx is a technically more difficult procedure, with a worse prognosis than the first lung transplantation, but it's the only currently available method of treatment for end-stage BOS.

## **A silent neoplasm - a case report of a patient with diffuse malignant peritoneal mesothelioma**

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**Tutor:** Prof. Mariusz Chabowski

**Introduction:** Mesotheliomas are infrequently diagnosed neoplasms. They most often occur in the pleura, however peritoneal origin of mesothelioma is very rare. The incidence of peritoneal mesothelioma is approximately 0.2-3 cases per million population. This type of neoplasm rarely gives any symptoms in an early stage, thus it is generally diagnosed in a metastatic stage. The most important risk factor of developing any mesothelioma is long exposure to asbestos. Treatment involves radical resection or palliative chemotherapy.

**Case report:** A 60 years old patient was admitted to the Surgical Clinic with a result of a routine chest radiograph and chest CT presenting a left lung tumor. The patient presented no symptoms and was in a good condition. For further diagnostics a PET-CT was ordered, which revealed a large mass in the greater omentum measuring 82x38mm with a pathological 18-FDG uptake. The scan also showed many smaller lesions infiltrating tissues all over abdominal cavity and pathological subclavian and parasternal lymph nodes. Surprisingly the previously revealed left lung tumor gave no pathological 18-FDG uptake. An exploratory laparotomy was later performed in order to obtain specimen for histopathological examination. Immunohistochemistry brought the diagnosis of peritoneal mesothelioma. Due to the metastatic stage of the disease a chemotherapy of pemetrexed and cisplatin was introduced. The patient has no known history of asbestos exposure.

**Conclusions:** We believe this case shows how deceptive peritoneal mesothelioma can be. Because of no symptoms this patient could have remained undiagnosed with a metastatic neoplasm for a long time. Due to the rarity of this disease it is hardly ever taken into consideration in a daily diagnostics. Peritoneal mesothelioma originating in the greater omentum is an extremely rare case which has a scarce representation in the literature."

## **Aspiration thrombectomy in high-risk patients with acute pulmonary embolism: a single centre experience**

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**Tutor:** MD Michał Kosowski, MD PhD Piotr Kubler

**Introduction:** Acute pulmonary embolism (PE) is the third most frequent cardiovascular disease which may result in severe disability or even death if undiagnosed or untreated. Therefore choice of optimal treatment along with risk stratification made by the Pulmonary Embolism Response Team (PERT) is crucial, especially in hemodynamically unstable patients with contraindications to systemic thrombolysis (ST). The PERT includes specialists such as interventional cardiologists, cardiac surgeons, anesthesiologists and radiologists. European Society of Cardiology guidelines recommend ST in high-risk PE. However, ST has many absolute contraindications and when they occur patients may benefit from aspiration thrombectomy, which is a less invasive alternative to surgical embolectomy.

**Case report:** In 2020, the thrombectomy program for Lower Silesia Region was launched at University Hospital in Wrocław (USK). Six patients have undergone the procedure so far. In the presented cases the Indygo system was used to aspire the thrombi and once the pig-tail system to perform local thrombolysis. Five out of six patients survived the procedure and experienced complete or partial resolution of symptoms. Four of them were male aged from 48 to 66 years old. Three of them were admitted to the hospital with acute high-risk PE and one suffered from moderate-high-risk PE. Two female patients were 49 years old and 64 years old and both were admitted with high -risk PE. All patients have undergone catheter-directed therapy. Four procedures were fully successful and resulted in indisputable improvement of patients' clinical condition.

**Conclusions:** The catheter-directed therapies (CDT) such as aspiration thrombectomy, represent effective methods of treatment for acute massive pulmonary embolism especially in patients with ST contradictions. This form of therapy is at present perceived as innovative and challenging but it may become more common in the future. Presented clinical case series support the hypothesis, that patients with high-risk and intermediate-risk PE may benefit from CDT.

## **Thrombosis of the deep dorsal vein and corpora cavernosa of the penis as the first symptoms of the metastatic colon cancer**

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**Presenting author:** Adrian Borkowski

**Tutor:** MD PhD Maciej Przudzik

**Introduction:** Deep dorsal penile vein thrombosis and thrombosis of corpora cavernosa are rare and not fully understood urological emergencies. The deep dorsal vein of penis runs along the midline groove in the center of dorsal part of penis, beneath the deep fascia of penis and outside the tunica albuginea of the corpora cavernosa. Difficulty with maintenance of proper blood flow may lead to painful penile swelling and partial, or complete erection.

**Case report:** A 86-year-old male patient was admitted to the Department of urology complaining about non-painful, hard swelling penis. He reported increasing impediment in urinating. The first lower urinary tract symptoms (LUTS) and hard swelling of penis appeared 4 months earlier. In the examination penis wasn't elevated or stiffed. Digital rectal examination (DRE) showed a smooth prostate enlargement without pathologies. Patient's both lower limbs were found to be swollen. Patient also reported dyspnea at rest. The transabdominal ultrasonography (TAUS) showed 150ml bladder post void residual volume without abnormalities in upper urinary tract. In laboratory tests hemoglobin level 8,8g/dl and an increased levels of D-dimers (3350) were revealed. Doppler examination showed no blood flow in the deep dorsal vein of penis and only weak blood flow in corpora cavernosa and excluded an impaired venous flow in the lower limbs. Due to unclear clinical picture the computed tomography (CT) of abdominal cavity and pelvis was performed, which detected a tumor of the right flexion of the colon. Moreover, multiple liver and lung metastases were found.

After CT patient underwent core-needle biopsy (Tru-Cut needle). Procedure affirmed thrombosis of the corpora cavernosa of the penis. Pathology report revealed adenocarcinoma tissue in one of the biopsy specimens. Multiparametric magnetic resonance imaging (mpMRI) has shown metastatic tumor of the size of 3 cm in the crus of penis. Transfusion of 2 units of concentrated red blood cells and catheterisation with the use of 12Ch Foley catheter were performed. Conservative treatment was performed using unfractionated heparin, antibiotic therapy and anti-oedema therapy (furosemide). The patient did not give his consent for further diagnostic procedures (colonoscopy) and was discharged home on his own request.

**Conclusions:** Since the deep dorsal vein of penis thrombosis is an uncommon medical condition, there are no strict guidelines for diagnose and treatment. In the literature we can find only few described cases with this diagnosis and not much else of thrombosis of corpora cavernosa with, or without deep dorsal penile vein thrombosis accompanying. As it turned out after diagnostic process, penile vein thrombosis was secondary condition to detected advanced metastatic colon cancer set in right colic flexure. Performed core needle biopsy confirmed these assumptions.

## Management of acquired esophagopulmonary fistula after gunshot

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**Tutor:** Prof. Bartosz Kubisa

**Introduction:** Esophagorespiratory fistula (ERF) is a rare pathological communication between esophagus and respiratory tract. There are three general types of this communication: esophagotracheal, esophagobronchial and esophagopulmonary, which is the least common. These kinds of communications might be congenital or acquired. The most frequent cause is malignancy (cancer of the esophagus). Other etiologies include thoracic trauma, infection, esophageal instrumentation, esophageal diverticulum etc. Treatment of the fistula depends on the etiology and location. Symptoms are not specific. Therefore, esophagorespiratory fistula may be present for months or years before the diagnosis.

**Case report:** In 1990, an 18 year old male was shot in the right side of the chest. Since 2013, the patient has been experiencing hemoptysis and gagging in recumbency. Lying on the side would provide improvement. The patient was admitted to the Department of Thoracic Surgery and Transplantation on 5th October 2020 due to bleedings from the respiratory tract. Bronchofiberscopy revealed active bleeding from the right middle lobe. X-ray with contrast showed pathological communication between esophagus and right lung parenchyma. Lower bilobectomy was performed and fistula was resected. One month later pleural empyema has developed, and patient required hospitalization once again. Fragment of VIII rib was resected and pleural empyema was cleansed. In addition, drainage and antibiotic therapy were applied. Several weeks later the recurrence of fistula had been observed but it has closed spontaneously. According to the patient, his condition has been largely improved and unpleasant symptoms (gagging, coughing) are no longer present.

**Discussion:** In case of benign and acquired esophagorespiratory fistulas, surgery is a treatment with the best outcomes. Surgical strategies to treat ERF include fistula resection, repair or bypass. Treatment improves quality of life, as it eliminates such unpleasant symptoms like dysphagia, recurrent cough or hemoptysis. Long lasting fistula causes lung parenchyma damage. Thus, early diagnosis and treatment is crucial, to avoid damage of lung parenchyma and pulmonary resection.



## **Appendiceal mucocele: a case report and standard treatments of this rare entity.**

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**Presenting author:** Julia Wojtowicz

**Tutor:** MD Florian Fanget

**Introduction:** Appendiceal mucocele is a rare, benign or malignant tumour with an incidence of 0.3–0.7% of all appendectomies. This is an accumulation of mucus which provokes a dilatation of the appendix. We define four types of appendiceal mucocele: retention cysts, epithelial hyperplasia, mucinous cystadenoma and mucinous cystadenocarcinoma. Several symptoms can revealed this disease, as acute appendicitis or palpable mass in the right lower abdominal quadrant. Patients are asymptomatic in 20–25% of cases. Incidentalomas is a frequent discovery mode of the disease. Abdominal CT scan or ultrasonography are useful diagnostic tools.

**Case report:** A 50-year- old women was referred for an ultrasonography as a monitoring of fibromyomatous uterus. Examination revealed the presence of previously known uterine fibroids and no pathological abnormalities of ovaries. A lesion of 9 cm was discovered with heterogeneous liquid close to the fallopian tube and the right ovary. A CT scan and an abdominal MRI were performed in order to define the ovarian or appendicular origin of this tumor. They confirmed the presence of a voluminous appendicular mucocele. This patient underwent a laparoscopic appendectomy with resection of a part of the caecum with stapling and removal of the meso-appendix. Exploration of abdominal cavity was without any particular abnormality in particular ovaries were safe, without intraperitoneal effusion of mucin. Histopathological examination confirmed the presence of low-grade, no-perforated appendicular mucinous mucocele of 15 cm with complete safe resection of the appendiceal base.

**Conclusion:** This case proves that mucocele can be completely asymptomatic and undetected for a long time, which could be mistaken for an ovarian tumor. Untreated mucocele may rupture and lead to pseudomyxoma peritonei, when mucin is spread throughout the peritoneal cavity. Despite the large size of appendix, it was not detectable during clinical examination and incidental detection is frequent. Early resection of the appendix reduces the risk of further complications. Preoperative imaging is essential in order to evaluate size of mucocele, its potential rupture, a peritoneal dissemination and even its morphological grade. These observations can help surgeons to adopt the best surgical strategy. The type of surgical treatment is also related to the histological type of the lesions. Low-grade tumors are treated with appendectomy and resection of a part of the caecum with removal of the mesoappendix. Treatment of high-grade tumors requires a right hemicolectomy or even cytoreductive surgery combined with hyperthermic intraperitoneal chemotherapy (HIPEC) in patients with advanced stage disease or perforated mucocele and in case of pseudomyxoma peritonei. Low grade tumors present a 5-year survival rate of 91-100%, however malignant tumor 5-year survival rate is 25% because of possible unresectable lesions.

## Ischemic stroke complicating transsphenoidal pituitary macroadenoma resection

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**Presenting author:** Aneta Stabryła

**Tutor:** MD PhD Bogdan Kolarz

**Introduction:** Systemic sclerosis is a rare disease. It is characterized by progressive skin fibrosis that begins its development in the distal extremities and extends proximally into a generalized form. Although the etiology of scleroderma is still unknown, there have been increasing reports of recently discovered work-related or drug-induced environmental factors. The scleroderma-like syndrome has been reported in patients exposed to organic solvents and epoxy resins. The correlation between these factors and the autoimmune response is not entirely clear.

**Case report:** A 58-year-old female was admitted to the Rheumatology Clinic in November 2019 in order to perform further assessment/diagnostics--wybierz któreś of systemic connective tissue disease. In 2017, the patient was treated at the Allergology Clinic for skin lesions accompanied by severe itching and erythematous-edematous lesions on the skin: swelling of the lips, eyelids, and changes on the limbs. She reported hardening of the skin of the trunk, forearms, lower legs, periodically recurrent joint pain and swelling of the fingers since January 2019. She denied contact with any allergenic factors prior to symptoms' onset. Physical examination revealed shiny hardening of the skin of both hands proximally to the metacarpophalangeal joints with reddening and hardening of the skin on the trunk and lower legs, in the absence of Reynaud's sign, and no ulcerations on the fingertips. Due to the ambiguous picture of described changes, which suggested systemic scleroderma (EULAR-9 points) - a skin sample was taken from the left leg for histopathological evaluation. On the last day of the patient's presence in the Clinic, she reported that the lesions in described skin areas developed after she moved to a new home, where a large area was covered with travertine preserved with organic resin. She also admitted that since the beginning of hospitalization (18 days) she noticed a significant improvement of her condition - skin hardening decreased and redness disappeared completely which lasted for several months. In the face of newly discovered facts a suspicion of scleroderma-like syndrome was raised due to allergies. Antihistamine and antihypertensive drug were added to treatment. The patient was discharged in good general condition for outpatient treatment.

**Conclusions:** The patient developed scleroderma-like syndrome after exposure to substances (probably epoxy resins) within travertine. After longer hospitalization, in the absence of contact with the triggering factor, our patient felt better, her general condition improved. The degree of hardening of the skin decreased and the patient's well-being improved significantly. Due to the ambiguous picture of symptoms it is important to carry out a proper differential diagnosis between systemic sclerosis and scleroderma-like conditions to avoid misdiagnosis and inappropriate treatment.

## MANAGEMENT OF THE PERIORBITAL NECROTIZING FASCIITIS – A REAL CHALLENGE

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**Tutor:** MD PhD Mihaela Perțea

**Introduction:** Necrotizing fasciitis is a severe infection of the skin and the subcutaneous tissue with a significant rate of mortality. Over 20 years, only 94 cases of periorbital necrotizing fasciitis were reported.

**Case report:** We present the case of a 67-year-old, homeless, with psychiatric history, who suffers from a multiple wound aggression in the cephalic extremity. He addresses 14 days after the trauma with an infection of the left hemifacial with extension to the scalp and occipital region. The area of necrosis is about 10/7 cm in the vertex. For diagnosis, LRINEC (laboratory risk indicator for the diagnosis of necrotizing fasciitis) is used, obtaining a score of 9. The microbiological examination shows a polymicrobial infection. Under general anesthesia necrectomy, enucleation of the left eyeball, and fasciectomy were made. Parieto-occipital necrectomy leaves the bone exposed. It is surgically reintervened for the secondary suture of the wound and the coverage of the denuded bone with a rotation fascial flap and plastia with free split skin. During hospitalization, the patient undergoes a type A and B clostridium difficile infection, with a relapse 3 weeks after the first manifestation. The patient is discharged after 40 days of hospitalization. The patient sent to the psychiatric clinic to continue the specific treatment. The patient is completely cured and will need an ocular prosthesis.

**Conclusions:** Necrotizing fasciitis is a rare, very aggressive pathology with high mortality potential, for which treatment should be established immediately.

## Case report: Intranasal ectopic tooth in adult

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**Tutor:** MD Donata Suckyte

**Introduction:** An aberrant tooth can be found in sites outside of the oral cavity and can be supernumerary, deciduous, or permanent tooth. The presence of supernumerary or ectopic teeth is not an uncommon fact, which occurs in 1% of the general population. The ones that have been reported include the mandibular condyle, coronoid process, orbit, palate, nasal cavity, and the maxillary antrum. Intranasal tooth represents a small portion of all reported cases of ectopic tooth and is a rare phenomenon. The cause of intranasal eruption of teeth is unclear; trauma, infection, and abnormal development probably play a significant role. The identification of such teeth can be important since they have the potential to cause considerable morbidity.

**Case report:** 2021-01 A 45-year-old Caucasian male came to the department of Otorhinolaryngology.

Complaints: difficulty to breathe through the right nostril (patient did not remember when it started), right sided rhinorrhoea, snoring, bad smell. Rhinorrhoea and bad smell gets more intensive in winter.

Anamnesis morbi: patient used variety of nasal sprays with no relief of symptoms.

Anamnesis vitae: Patient's clinical history revealed that he had a facial trauma when he was 5-years-old. No history of systemic diseases or previous surgical procedures.

Status praesens: Pathological findings of otorhinolaryngological examination: endoscopic examination: in the right nasal cavity hard foreign body in the floor of his right nasal cavity.

Treatment: 2021-02 endoscopic removal of ectopic tooth was performed under general anesthesia. The tooth was removed using an intranasal approach. To prevent postoperative epistaxis nasal packing was placed and removed 12 hours later, with no complications.

**Conclusions:** Intranasal ectopic tooth is rare although potentially harmful when left untreated. It may cause significant morbidity such as epistaxis, paranasal sinusitis, nasal septal deviation, nasal septal abscess, and nasal oral fistula. When intranasal ectopic tooth is surgically removed, patient's quality of life improves. Extraction of the intranasal tooth under endoscopic guidance has the advantages of good illumination, clear visualization, and precise dissection. The diagnosis is simple, fast, and cheap.

## Iatrogenic secondary dacryocystitis due to repeated maxillary sinus cyst

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**Tutor:** MD Jekaterina Kondratishko

**Introduction:** Secondary iatrogenic dacryocystitis is a rare but serious complication, that requires multidisciplinary approach from both ophthalmologic and otorhinolaryngologic sides.

Ophthalmological functional probes: fluoresceine probe, nasolacrimal passage test, biomicroscopy (slit lamp). Otorhinolaryngological: nasal endoscopy, dacryocystography (CT).

**Case report:** Patient (female 44 years old) has had multiple surgeries due recurrent left maxillary sinus cyst. Immediately after last operation (August 2019) patient started to experience permanent tearing with episodes of purulent exacerbation. She has referred to several specialists over the course of 1.5 years, but no reason of tearing was found. In May 2020 acute purulent dacriocystitis occurred.

After the symptoms were reduced by antibiotic therapy, ophthalmological functional tests were performed. The tear drainage was absolutely blocked, and discharge from lacrimal sac indicated chronic inflammation. Simultaneously, ENT-specialist endoscopically diagnosed recurrent giant cyst in left sinus. In CT: recurrent giant retention cyst on the left side, that has completely filled in left maxillary sinus with prolapse to the middle meatus. The passage of contrast through left lacrimal drainage system was also impacted, as there was no contrast in nasolacrimal canal. Based on the CT findings it was concluded that the mechanical disruption of the lacrimal canal is located in the projection site of maxillary sinus opening. Radiologist has suggested that it was due to sinus contents that the lacrimal drainage was blocked. During the surgery: retention cyst excision from maxillary sinus with following diagnostic probing. After localisation of precise site of nasolacrimal canal disruption, endoscopic dacryocystorhinostomy (endo-DCR) with catheterisation was performed.

**Conclusion:** Complications after sinus surgeries are quite common. However, differentiation and solution of this type of problem is prime example of multidisciplinary approach. A team that consists of otorhinolaryngologist, ophthalmologist and radiologist is required to precisely locate the source of the problem and choose the right treatment tactics.

## Acute otitis media with instantaneous intracranial complications

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**Presenting author:** Jakub Gajdecki

**Tutor:** Prof. Jarosław Miłośki

**Introduction:** While the acute otitis media (AOM) is a common clinical entity among paediatric patients, the incidence of AOM decreases to 1.5-2.3% in adults aged 25-85 years. Persisting over 2 weeks or recurring AOM may spread further through 3 major routes: direct extension, thrombophlebitis, and hematogenous dissemination. Nonetheless, the AOM complications appear only in 0.26% of cases, mostly in the form of mastoiditis (0.16%), preferably in patients aged on average 37 years. Intracranial (IC) complications show up rarely, however, they carry a high mortality rate of 18.4%, making the early diagnosis with proper treatment crucial for the outcome.

**Case Report:** A 35-year-old female patient was admitted to the ENT Department urgently with AOM with IC complications. The patient has reported severe pain of the right ear and right half of the head lasting for the last 2 days accompanied by fever (39°C). Blood samples were taken giving the following results: increased CRP (309 mg/L), leukocytosis and neutrophilia. On examination the patient presented perforated right tympanic membrane with purulent discharge. Unenhanced head CT revealed multiple air bubbles and small amount of hyperdense fluid (3mm) on the right hemisphere. The surgeons decided to perform urgent right antromastoidectomy, introduced broad spectrum antibiotic therapy and transferred to ICU. The next day the patient's condition aggravated (GCS 3), CT showed an increased amount of fluid (5,5mm) on the right hemisphere. Neurosurgeons qualified the patient for craniectomy for drainage of IC empyema. In the following days the patient's condition ameliorated. The patient was discharged after 17 days in good shape.

**Conclusion:** This case report depicting the aggressive course of AOM highlights the importance of early detection of its complications. Uncommon, however, IC complications may appear rapidly after the AOM begin and give symptoms nearly simultaneously with these triggered by AOM. Such cases require a broad approach, making the cooperation of ENT surgeons, neurosurgeons and ICU specialists essential for the proper therapy. Early surgical intervention seems to be necessary to maintain the patient's life. Further studies concerning the mechanisms and risk factors of rapid course of AOM may have a great impact on prevention and decreasing its high mortality.

## A case of an atypical course of squamous cell carcinoma of the paranasal sinuses

Jill Dybiec

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**Presenting author:** Jill Dybiec

**Tutor:** Prof. Jarosław Miłośki,

**Introduction:** Malignant neoplasms of the nasal cavities and paranasal sinuses are relatively rare and constitute approximately 4% of all head and neck neoplasms. The most common malignant neoplasm is keratinizing squamous cell carcinoma. Patients usually report nasal discharge, facial paresthesia, toothache on the side of the lesion, or diplopia. These symptoms occur late, and the earlier symptoms, similar to the common chronic paranasal sinusitis, may be underestimated. As a result, the cancer is often diagnosed at an advanced stage of the disease. G1 squamous cell carcinoma has the worst prognosis of all nasopharyngeal carcinomas as it has a high tendency to infiltrate and local growth. The main therapeutic method is surgical treatment - extensive mutilating operations and radiotherapy, but the cancer is poorly sensitive to radiotherapy, making it difficult to cure.

**Case report:** A 31-year-old woman suffering from type 1 diabetes was admitted to the Department of Otolaryngology due to an exacerbation of chronic inflammation of the paranasal sinuses on the right side, discharge from the right nasal passage, regurgitation of the upper eyelid, diplopia, reduced mobility of the right eyeball and paresthesia of the right half of face. In September 2020, the patient underwent an operation of the maxillary and ethmoid sinus on the right side in another ENT center due to inflammatory changes confirmed in the CT scan of the paranasal sinuses and was also diagnosed with trigeminal neuropathy. In the material sent for histopathological examination, inflammatory and fungal lesions were confirmed. The woman was operated again in different clinic in December of the same year due to right sphenoid sinusitis. The histopathological examination revealed inflammatory changes within the removed tissues. During the patient's diagnostics at the Clinic with initial suspicion of invasive mycosis of the paranasal sinuses on the right side, infiltration within the right orbit, and cavernous sinus, the material was collected for histopathological examination from the right ethmoid sinus. The squamous cell carcinoma of the right ethmoid sinus was diagnosed.

**Conclusion:** The variety of symptoms presented by the patient shows that the clinical picture of squamous cell carcinoma of the sinuses can strongly imitate chronic sinusitis or invasive mycosis. Even negative results of histopathological examinations of tissues, which were established twice in a relatively short time, no history of carcinogenic factors and the young age of the patient should not reduce oncological vigilance.

## **Extraskelatal Ewing's sarcoma of the prostate in 25-year-old patient - A case report**

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**Introduction:** Extraskelatal Ewing's sarcoma (EES) is a rare soft tissue tumor in contrast to the bone form of the Ewing's sarcoma, which is one of most common neoplasms found in children. The best diagnostic method to determine the type of tumor present in the prostate is transrectal biopsy and immunohistochemical examination of the collected tissue. Ewing's sarcoma is the tumor made of "small blue cells" like other cancers such as neuroblastoma or lymphoma. Detection of MIC2 antigen in immunohistochemical examination allows to distinguish Ewing's sarcoma from other neoplasms that give the similar histological picture, especially if no antigens characteristic for them are found in the collected material.

**Case Report:** A 25-year-old male was reported to the Hospital Emergency Department, where he was referred by his family doctor because of lower urinary tract symptoms (LUTS) and recurrent urinary tract infections (UTI). In digital rectal examination (DRE) and transabdominal ultrasound (TAUS) were found enlargement of the prostate and urine retention. Patient was qualified to transrectal biopsy of the prostate (TRUS Bx), because of suspicion of an unusual tumor. The material was sent to the immunohistochemical examination, because of primary diagnosis of PNET. The tumor turned out to be primary EES. The patient did not give his consent to radical cystoprostatectomy surgery, which is the gold standard of treatment. Therefore transurethral resection of the prostate (TURP) and chemoradiotherapy was conducted. The patient remains under constant control of the urology clinic. No metastatic changes or recurrence of the disease were detected in the patient since the surgery.

**Conclusions:** EES is a rare neoplasm, especially located in the prostate and the 5-year survival is relatively low. Transrectal biopsy and immunohistochemical tests are the necessary tools in diagnosis of EES. The treatment of choice is rapid radical cystoprostatectomy, which allows for complete removal of source of the disease and minimizes the risk of metastases. It is also worth noting that during the 4-year follow up, no recurrence of the disease was observed, because of good response for radio and chemotherapy, but late treatment complications such as urethral stricture and secondary bladder stones required endoscopic treatment.



## **A successful transcatheter aortic valve implantation in an extremely tortuous S-shaped aorta due to chest deformation: case report**

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**Tutor:** MD PhD Janusz Kochman, MD PhD Aleksandra Gąsecka

**Introduction:** Aortic stenosis (AS) is the most common valvular heart disease which requires medical intervention in adults. This condition remains asymptomatic for many years, however, it severely deteriorates patient's prognosis when the symptoms emerge – it is associated with 36-57% mortality within 3 years. In recent times, transcatheter aortic valve implantation (TAVI) has developed as an alternative procedure to surgical valve replacement for patients with severe symptomatic AS and with high surgical risk. Transfemoral access for TAVI yields best clinical outcomes and attempts are being made to apply this access in most cases.

**Case report:** We present a case of a 65-year-old woman with severe symptomatic AS and a history of breast cancer with status post mastectomy who was admitted to the hospital for interventional treatment of AS. Echocardiography confirmed severe AS (V max 4.4 m/s, mean aortic valve gradient 43 mmHg, indexed aortic valve area 0.31 cm<sup>2</sup>/m<sup>2</sup>) and a normal left ventricle ejection fraction (60%). Computer tomography revealed severe scoliosis, chest wall deformation and extremely tortuous, S-shaped descending aorta. Assuming that the complex anatomy will make successful sternotomy and latter rehabilitation impossible, the Heart Team decided to perform TAVI even though the patient had low surgical risk (1,54% in EuroScore II). Despite this anatomical challenge, the patient was successfully treated with TAVI.

**Discussion:** TAVI is a method of choice for treating severe AS in patients at increased surgical risk. The final decision considering the type of procedure should be made by the Heart Team based on the individual evaluation of patient's anatomy and comorbidities. Given the flexibility of second generation TAVI delivery systems, it is possible to safely perform the procedure even in difficult anatomy. Moreover, in spite of considerable anatomical anomalies, transfemoral TAVI may be successfully performed in patients with an extremely tortuous, S-shaped aorta.

## **Case Studies: Surgery 2**

**Coordinators:** Joanna Kulicka, Michał Szymchel

### **Jury:**

**MD PhD Adam Durczyński**

**MD PhD Piotr Koza**

**MD PhD Maria Szubert**

**MD PhD Jędrzej Lesman**

## **Aorto-duodenal fistula after endovascular aortic repair in inflammatory abdominal aortic aneurysm**

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**Tutor:** Prof. Arkadiusz Migdalski

**Introduction:** Formation of aorto-intestinal fistula after endovascular repair of abdominal aortic aneurysm is rare but very severe complication, especially in young patients, such as presented in this case. Surgical repair of aortoenteric fistula is fraught with high mortality during the procedure.

**Case report:** A 34 year old man underwent endovascular repair of an inflammatory abdominal aortic aneurysm impending rupture. 8 months after endovascular aortic repair patient has developed endograft infection with an aortoduodenal fistula leading to a septic shock. Procedure of aorto-bifemoral bypass using composite iliac veins has been performed. Aortoduodenal and aortoiliac fistulas has been operated.

**Conclusion:** Aortoenteric fistula is a rare but severe complication, expanding the way since admission to the hospital ward till implementation of treatment. The method of treating a fistula is a serious surgery, the effects of which are prognostically uncertain regardless of the method used. The basic method of treatment is vascular and gastrointestinal reconstruction, but the course of surgery and the specificity of the procedure on the gastrointestinal tract depend on the type of fistula.

## **A seemingly straightforward diagnosis... or is it? A case study of papillary thyroid cancer with bone and kidney metastases.**

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**Tutor:** MD PhD Agnieszka Żyłka

**Introduction:** Thyroid cancers have heterogeneous clinical presentation. The most frequent type – papillary thyroid carcinoma (PTC) metastasizes through the lymphatic system, usually to the cervical nodes but in rare cases via the bloodstream to the lungs. The second most frequent type – follicular thyroid carcinoma (FTC) is marked by hematogenous spread to the lungs and bones. Metastases to the bones are often seen with breast and prostate cancer.

**Case report:** A 51-year-old man experienced extreme lower back pain which upon admission to hospital turned out to be due to a pathological fracture of L2 vertebra. Patient underwent L2 laminectomy as a treatment but the cause of this fracture remained undetermined. A sample of tissue was histopathologically examined and, surprisingly, immunohistochemistry was negative for common cancers metastasizing to the bones. However, it was positive for thyroglobulin (TG) and thyroid transcription factor 1 (TTF-1), which suggested thyroid cancer metastasis to bone, most probably FTC. Moreover, an additional tumor in the right kidney was found for further diagnosis. Thyroid ultrasound was ordered in search for any suspicious nodules. It revealed two hypoechoic focal lesions in the right lobe and two normoechoic in the left, both benign-looking of about 10mm in diameter, with the largest measuring 15x11.5x19mm. Due to all the findings, the patient was referred to the Department of Oncological Endocrinology and Nuclear Medicine for thyroidectomy with cervical lymphadenectomy. On admission the laboratory tests showed significantly increased thyroglobulin level (2574 ng/ml). TSH was within normal range and fT3 was elevated. Postsurgical histopathology unexpectedly revealed not FTC but PTC (pT1bN0M1) in both lobes. One tumor infiltrated its capsule (but not thyroid's) and no signs of angioinvasion or lymph node metastases were found. He also underwent laparoscopic partial nephrectomy because of confirmed PTC metastasis to the right kidney. However, post-therapeutic scintigraphies revealed uptakes in the cervical region, IV right rib and lumbar vertebrae. Skeletal uptakes were accumulating with every cycle despite the higher dose of therapeutic radiation. The patient remains under Department's care and is due to have 5th RAI session in July. A targeted therapy with lenvatinib or sorafenib is considered.

**Conclusions:** In metastatic bone disease, it is worth performing not only the tests directed for most frequent causes, but also a thyroid ultrasound - as it is a fast, easy and affordable procedure which can prove useful in detecting potential primary lesion. Any delay in diagnosing the primary lesion is connected with worse therapy outcomes. Nowadays, biological targeted therapy can be the last hope for effective treatment and better prognosis in case of failure of other methods.

## **Meigs' or pseudo-Meigs' syndrome? Peritoneal effusion, pleural effusion and elevated CA 125 in an SLE patient.**

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**Tutor:** MD PhD Krzysztof Kaliszewski

**Introduction:** Meigs' syndrome is defined by the presence of ascites, pleural effusion and benign ovarian fibroma or fibroma-like tumor. If the tumor cannot be assigned to one of these groups and is in fact a benign or malignant pelvic tumor, we define this condition as pseudo-Meigs' syndrome. In both of these syndromes, ascites and pleural effusion resolve after the complete resection of the tumor. Secondary ovarian tumors caused by colorectal metastases rarely cause pseudo-Meigs' syndrome and the etiology of the symptoms remains unknown. Diagnostic difficulties in differentiating between these syndromes in a patient with systemic lupus erythematosus (SLE) are due to the fact that the marker of CA 125 has been observed to be elevated in immune-related diseases without cancer.

**Case report:** A 34-years old woman was admitted to the Department of Gynecology and Obstetrics because of abdominal pain. On examination, the patient's abdomen was distended and painful on palpation. The woman reported dyspnea and fatigue. The patient's medical history included multiple autoimmune diseases - seropositive rheumatoid arthritis (RA), SLE, lupus glomerulonephritis with nephrotic syndrome and ulcerative colitis. The USG-TV showed a large litho-cystic mass in the uterine appendages. Small amount of fluid was visible in the abdominal cavity and in the recto-uterine pouch. In the right pleural cavity, a significant amount of free fluid causing atelectasis in the lower right lobe was observed. Laboratory tests showed anemia and elevated serum tumor marker levels (CEA: 5.35 ng/dL, CA19-9: 100.34U/mL, and CA125: 796.1 U/mL). The patient was qualified for adnexectomy and referred to the Department of General, Minimally Invasive and Endocrine Surgery immediately. During the operation, a bilateral adnexectomy and right hemicolectomy were performed because a tumor was observed in the proximal part of the transverse colon in the subhepatic area. The histopathological examination of the resected part of the colon revealed adenocarcinoma G3 and metastatic of the tubular adenocarcinoma G2 on both ovaries.

**Conclusion:** The presented case emphasizes the ambiguity of the CA-125 marker, especially in patients with SLE. Elevated CA-125 could indicate a fibroma in Meigs' syndrome. It is also a part of pseudo-Meigs' syndrome as it may accompany a malignant tumor located in pelvis. However, elevated CA-125 may be not associated with any tumor, and in this case, it is called by Tjalma WAA as Pseudo-Pseudo Meigs' Syndrom (PPMS). PPMS is a newly emerging manifestation of SLE. Based on that information we can conclude that the presence of this characteristic triad of symptoms should always require careful observation, especially in patients with autoimmune diseases.

## Is ovarian tissue an important issue?- fertility-sparing surgery in ovarian cancers

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**Introduction:** Borderline ovarian tumors (BOTs) make up 10% of ovarian tumors. They have a few malignant tumor properties, such as cellular proliferation, stratification of the epithelial lining of the papillae, nuclear atypia and mitotic activity. However, their discriminative feature is absence of stromal invasion with peritoneal implants. Implants can be invasive or noninvasive, which is an important prognostic factor. Prognosis is relatively good- 5-years-survival is around 80%, however it is still not satisfying despite the non-invasive character of a tumour. Patients with BOTs are often a few years younger than those with cancers and are still in a reproductive age. For that reason, fertility-sparing surgery (FSS) should be considered in the decision-making process.

**Case report:** A 22- year-old woman complained about the continuously increasing circuit of abdomen and pelvic pain. She had never been to a gynecologist before. Eventually, an enormous-size cystic-lytic pelvic tumor, which constricted organs of the abdominal cavity, was found using ultrasound. Laboratory results showed elevated LDH and CA-125 slightly above reference values. The patient underwent laparotomy, which due to her age was fertility sparing. Midline cut from the xiphoid process to pubic symphysis was done in order to avoid breaking up the tumor. Because of clinical image and previous data, non-epithelial tumor was considered. Despite suspicion, histopathology results showed borderline tumor.

**Conclusion:** In very young patients, who want to preserve fertility and hormonal function of ovaries, removal of affected ovary can be offered. Then, a few years later- after filling reproduction plans by the patient- the remaining ovary is removed. Also, this procedure shortens time of hormone replacement therapy or when it is contraindicated, symptoms of estrogen deficiency. Moreover, reproductive outcomes are promising, since most of the patients manage to become pregnant after surgery. However, the risk of recurrence in FSS is higher than in radical surgery. So, every case should be considered individually, taking account of the patient's will, age and stage of disease.

## LOCALLY ADVANCED CERVICAL CANCER IN PREGNANCY: A CASE REPORT

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**Tutor:** MD Zalan Horvat

**Introduction:** Cervical cancer is a significant women's health problem worldwide. This cancer often has no symptoms in its early stages. Women from 35 to 44 years old are most likely to get it.

**Case Report:** In this paper, we present the case of a 25-year-old woman who was admitted to our clinic at 40 weeks pregnancy because of pelvic and abdominal pain, but without other subjective signs or symptoms at the time of examination. She had not received regular antenatal check-ups. Based on the clinical and obstetrical examination a cervical lesion was identified. The cervix was hypertrophic, with a 1,5-cm cauliflower-like formation visible at its lower lip. The lesion presented contact bleeding. The established diagnosis was: G1P1 40 weeks of single live fetus, in cranial presentation with intact membranes, eutocic pelvis bones, without being in labor and cervical tumor. The patient denies the existence of significant family medical history. Personal history: menarche at the age of 12, regular periods (28-30 days), periods last for about 5-6 days, normal flow. Next day, the patient delivered a live male newborn by Lower-Segment Transverse Cesarean Section because of the cervical tumor. Birth weight: 3580 gr, length: 53 cm; Apgar: 10/1 min; 10/5 min. Also, for the cervical tumor, a biopsy was performed. Histopathological examination confirmed the diagnosis of a stage IIA1 moderately differentiated non-keratinized squamous cell carcinoma of the cervix (G2). During hospitalization, the patient underwent treatment with Amoxiplus, anticoagulant treatment with Clexane, uterotonic with Oxistin, antianemic treatment with Ferrum Hausmann, analgesics and anti-inflammatory. Anti-HIV antibodies 1 & 2 were performed and the rapid test was negative. At the ultrasound examination was highlighted a well-involved uterus, with transonic endocavitary echo of 0.9 cm. The clinical evolution was favorable, the patient was discharged in good general condition, with no fever, supple and elastic breasts, lactation present, surgical wound healing, serosanguinous lochia, physiological urination, intestinal transit present. It is recommended at home treatment with Fraxiparine for 7 days.

**Conclusion:** The peculiarity of the case consists in the appearance at such a young age of a malignant tumor of the cervix with unpredictable and unknown evolution. Regular antenatal check-ups are important, because the management of patients with cervical cancer and pregnancy is based upon the stage of the cancer and the gestational age. Cervical cancer grows slowly, so there's usually time to find and treat it before it causes serious problems. The patient should return to a Gynecologic-Oncology center in order to have further treatment mainly consisting of chemoradiotherapy.

## Radial Nerve Entrapment in the Arm in a Post-Stroke Patient

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**Presenting author:** Mykolas Udrys

**Tutor:** MD PhD Mindaugas Minderis

**Introduction:** Radial nerve entrapment can occur at numerous locations within the course of the nerve. Less common is the entrapment of the radial nerve at the arm, where it pierces the lateral intermuscular septum and courses through the lateral head of the triceps muscle. Due to the fact that radial nerve entrapment at this location is an uncommon diagnosis, it is prone to under-recognition.

**Case report:** 76-year-old patient presented with left arm pain, numbness and tremor. Patient had a stroke 8 years ago, which damaged the left side of the body, resulting in tremor of the hand. Pain of the left arm began about a year ago. Pain irradiates posterior side of the arm, from shoulder to the hand. Patient started to wake up at night because of the pain. Clinical examination on admission revealed hypoesthesia in the whole hand, which could be a residual consequence of the stroke. The left arm was swollen, palpation under triceps muscle was painful. Dynamometry showed muscle weakness in the left arm with left arm grip strength 21 kg and right arm grip strength 36 kg. A diagnosis of left radial nerve entrapment in the arm was established. Surgical decompression of the nerve was performed through incision made on the lateral side of the middle third of the arm. After dissecting intramuscular septum between lateral head of triceps muscle and brachial muscle, radial nerve was exposed. The fibrous arch of the lateral head of the triceps muscle was thick and significant compression of the radial nerve was noted. A fasciotomy was performed; the passage for the nerve became free. After the decompression, pain and numbness resolved immediately. Arm movement amplitude increased, it became easier to grasp small objects. Strength of the left arm also increased.

**Conclusion.** Radial nerve compression in the arm is often misdiagnosed resulting in improper treatment of the condition. Clinical evaluation and thorough taking of the patient's anamnesis are the main factors of diagnosing this radial neuropathy, especially in patients with previous stroke anamnesis. Stroke and its consequences can distort and mask peripheral neuropathy symptoms. Surgical nerve decompression is an effective treatment of the condition.



## Fourth-degree perineal tear as a result of spontaneous labour

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**Presenting author:** Julia Koćwin

**Tutor:** MD PhD Katarzyna Dzika

**Introduction:** Perineal tear is a common injury that woman experience during spontaneous labour. Obstetric anal sphincter injuries occur in approximately 5% cases. Classification by Sultan and Fernando distinguished four degrees of perineal tear. An IV degree perineal tear is defined as a perineal trauma, sphincter complex injury and disruption of the rectal mucosa. Surgical repair of the perineum is the treatment of choice, preferably in the shortest possible time after labour.

**Case report:** Here, the case report of a 26-year old female patient who was admitted to the Department Of General Surgery and Colorectal Surgery due to fourth-degree perineal tear as a result of a spontaneous delivery was presented. On admission the patient presented with painful postpartum wound and massive damage to the perineum. Due to excessive bleeding and soreness further examination was discontinued. The patient was diagnosed with tearing of the sphincter ani externus muscle, sphincter ani internal muscle, levator ani, rupture of the posterior vaginal wall and vulval vestibule disruption. Tear gap was about 10 cm long- from vulval vestibule to 1/2 its length. There was profuse bleeding. Fibers of the sphincter ani externus muscle, sphincter ani internal muscle, levator ani were identified and dissected. The muscles were sewn up. Subcutaneous tissue was sutured. The patient underwent laparotomy. The loop ileostomy was performed due to damage to the perineum and vagina described above. There were no complications during postoperative course which lasted for 3 days. Laboratory results were within normal limits, wound was healing, there were no pain in the abdomen.

**Conclusion:** IV degree perineal tear may resultant fibrosis of the perineal muscles and defect of the rectovaginal septum which can lead to fecal incontinence and sexual dysfunction. A proper barrier between the vaginal and anal natural orifices were restored as a result of anterior anal sphincter repair with reconstruction of the perineal body and vaginoplasty. The aesthetic effect was also satisfactory. After several months intestinal integrity was restored. The operation allowed the patient to return to her daily activity.

## **Ovarian clear cell carcinoma of extreme size: a rare and complex clinical case.**

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**Introduction:** Ovarian clear cell carcinoma represents the second most common epithelial ovarian tumors and accounts for 5-10% of all epithelial ovarian cancers. OCCC is known to have poor outcomes, especially when compared to other epithelial ovarian cancers. Iatrogenic parasitic myomas are a relatively new pathology, which has become more prevalent after the introduction of laparoscopic morcellation.

**Case report:** A 46-year-old woman presented to the emergency department with complaints of acute abdominal pain, nausea and vomiting. Her past surgical history included two laparoscopic myomectomies. Patient reported irregular menses with long periods of amenorrhea, with menstrual bleeding of up to one month which has been going on for years. No family history for malignant ovarian and breast cancer was reported.

On physical examination patient was alert, oriented, but in pain, extremely painful palpation of left side of the abdominal wall and an immobile tumor palpable from the ventral rectum side, signs of peritoneal irritation and acute peritonitis appeared. Laboratory investigation showed life-threatening anemia: hemoglobin 58 g/l and inflammatory markers: CRP 107 mg/l.

Abdominal CT scan revealed enlarged and deformed uterus with multiple uterine myomas was observed and a large (207x155x182 mm) thin-walled inhomogeneous tumor, connected to uterus and right ovary. Transvaginal ultrasound was performed by a gynecologist, enlarged uterus and multiple 7 cm myomas were detected. It was decided to perform emergency surgery- laparotomy. Inside the abdominal cavity 30x30 cm heterogenous, dark blue tumor in the right adnexa area, torsed two times was found. In the uterus multiple uterine myomas and parasitic myomas were found. Total abdominal hysterectomy with right salpingo-oophorectomy was performed. All parasitic myomas were removed. Tumor was removed without rupture, after removal it was weighted and was found to be 3700 grams. The patient left the operating room in stable condition and recovered uneventfully. Histological examination revealed right ovary clear cell carcinoma and ovarian endometriosis. Parasitic myomas were confirmed using clinical and anamnesis information. Full body CT scan revealed cystic tumors in left ovary, tumor in left breast that did not accumulate contrast. Ultrasound and biopsy of breast tissue was indicated to differentiate tumors. Core needle biopsy of breast tissue revealed fibrocystic changes, left breast Bi RADS 4 category. Currently patient is in remission and she is being monitored.

**Conclusions:** It is very important to closely monitor patients with abnormal menstrual cycles and history of laparoscopic morcellation for possible malignancy and parasitic myoma development. Parasitic myomas should be surgically removed upon diagnosis and malignancies treated according to protocol.

# Spontaneous rupture of the solitary renal pelvis as a first symptom of retroperitoneal fibrosis

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**Tutor:** MD PhD Maciej Przdziak

**Introduction:** Retroperitoneal fibrosis (also known as Ormond's disease) is a rare condition characterized by the presence of inflammation and fibrosis. In the course of the disease fibrous tissue usually surrounds the abdominal aorta and the iliac arteries. Process may spread and involve adjacent structures, what frequently leads to obstruction of ureter and renal failure. The condition is usually idiopathic but can also be secondary to factors like drugs, malignant diseases, surgery. Clinical manifestation depends on fibrosis localization. However, early signs of retroperitoneal fibrosis can be nonspecific – e.g., fatigue or weight loss.

**Case report:** 52-year-old male patient, a smoker, was referred from regional hospital to Urology Clinic because of the rupture of the solitary kidney pelvis and urinary leakage detected in computed tomography (CT) with concomitant acute kidney injury (AKI). Patient underwent left radical nephrectomy in 2013 because of the renal cell carcinoma (RCC) pT1a G2. In May 2020 patient was admitted to regional hospital due to anuria and right flank pain. Laboratory tests showed elevated creatinine levels and inflammatory markers. Patient required hemodialysis and due to the lack of improvement CT was performed, which revealed kidney pelvis perforation of the right kidney with urinary leakage to retroperitoneum and 70x40 mm mass in the middle part of the ureter. A ureteric stent (double-J catheter) was placed which resulted in pain relief and normalization of laboratory parameters. Afterwards, the patient underwent ureterorenoscopy (URS) with the biopsy which disclosed nonspecific mass surrounding middle part of the ureter and closing its lumen, without signs of transitional cell carcinoma (TCC). However, pathology report didn't exclude TCC but also took possibility of inflammatory cell infiltration into account. Multiparametric magnetic resonance imaging (mpMRI) was performed, which showed 75x46 mm mass retracting right ureter at the iliac vessels level. In the meantime patient arrived to Emergency Department with recurrence of the anuria. Hydronephrosis with >10mg/dl creatinine were revealed. Percutaneous nephrostomy (PCN) was performed which led to diuresis improvement and creatinine levels lowering. Since the clinical picture was still uncertain and due to the signs of progression, laparoscopic biopsy of the lesion was performed. Histopathological examination revealed fibromatosis. After consultation in Rheumatology Clinic the patient was diagnosed with Ormond's disease. As of today the patient is undergoing steroid treatment.

**Conclusion:** As a matter of its nonspecific clinical picture and because the disease is very rare, retroperitoneal fibrosis diagnosis process can be really difficult. This case was especially challenging because of its rapid onset without any warning signs preceding kidney pelvic perforation and due to the fact that involved solitary kidney.

## **A rare case of Ormond disease complicated by nephrectomy - a case report**

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**Tutor:** Prof. Janusz Tyloch

**Introduction:** Retroperitoneal fibrosis (RPF), also known as Ormond disease, is a rare connective tissue disease, characterized by fibrosis near the abdominal aorta and the iliac arteries that extends into the retroperitoneum. RPF occurs in 0.1-1.3/100000 patients, usually in the age of 50-60 years, less often in children. Men are affected 2-3 times more often than women. RPF may be associated with autoimmune disease, systemic vasculitis and IgG4-related disease. Over 70% of RPF's cases are asymptomatic until the manifestation of ureteral fibrotic strangulation, acute renal failure and the diagnosis of obstructive uropathy. In more than a third of cases, fibrosis is secondary to infections, trauma, radiation, neoplasm and drugs. The most common clinical presentation is a dull and constant pain in the hips, back or abdomen.

**Case report:** A 56-year-old man with a past medical history of retroperitoneal fibrosis was admitted to the hospital in January 2021 to replace a stent of the right ureter. In July 2018 the patient underwent a left-sided nephrectomy with suspicion of an inflammatory tumour of the left ureter. In histopathology of the left ureter, retroperitoneal fibrosis was confirmed. After diagnosis the patient had an ineffective steroidotherapy of fibrosis. In June 2020, the patient had an implantation of a double J stent. In November 2020, the patient had an operation of an implantation of a stent to the right ureter. There was performed a nephrostomy of the right kidney to the patient because of an obstruction of the right ureter stent. In January 2021, after an admission to the hospital, the patient had a right-sided antegrade pyelography in which the right ureteral stricture was confirmed. In laboratory tests there was an elevated creatinine level. In 12.01.2021 the patient had an endoscopic surgery. During the surgery, the self-expandable stent was placed in the right ureter.

**Conclusion:** Retroperitoneal fibrosis is a challenging disease in which radiological imaging is a gold standard in the diagnosis and follow-up. One of the main problems of diagnostic imaging is the differentiation between primarily inflammatory and malignant conditions of the retroperitoneum. There are no objective criteria of RPF's treatment. In the absence of ureteral obstruction, the first-line treatment of RPF are steroids, with an above 80% response rate. Tamoxifen was previously suggested as an alternative for GCS, but a recent RCT trial showed that it's less effective than prednisone. Signs of ureteral obstruction require ureteral stenting, followed by GCS therapy. If there is no remission or the steroid-related toxicity occurs, immunosuppressants or biological agents can be administered. Ineffective therapy points to the necessity of surgical ureterolysis. No signs of improvement within a month of follow-up prompts for CT scan and biopsy to verify the diagnosis. The ureteral stents are usually removed at 3 months after treatment.

## Multiple deep-seated glomus tumors: A constellation of the unusual

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**Introduction:** The vast majority of glomus tumors (GTs) are solitary neoplasms, typically found in the subungual region and mainly glabrous skin of distal upper and lower extremities. Tumors of deep soft tissue or viscera, on the other hand, are significantly rarer, comprising 3-10% of all glomus cell neoplasms. Multiple GTs is yet another odd presentation, as only 4-10% of these tumors show multifocal involvement. We present a case of a patient with a long history of neuropathic lower extremity pain, found to be having multiple glomus tumors in intermuscular clefts of the thigh.

**Case Report:** A 69-year-old woman presented with a 10-year history of left thigh pain. The pain worsened during the past year, finally becoming constant and severe, causing antalgic gait, sitting disability, disturbances of daily activities and sleep. On physical examination, extreme local tenderness was evident when palpating the posterior aspect of the thigh. Magnetic resonance imaging showed two well-circumscribed contrast-enhancing neurovascular structures in the adductor canal and one along the course of sciatic nerve, leading to a preliminary diagnosis of multiple localized intraneural neurofibromas. At surgery, the biggest nodule was found to be compressing the sciatic nerve, however neither the nerve nor adjacent tissues were infiltrated and the mass was easily resected. The most ventrally situated tumor was densely vascularized by branches of the adjacent femoral vessels, leading to a significant, albeit successfully controlled bleeding upon removal. The gross examination revealed three yellowish well demarcated nodules. Histologically, multiple capillary sized vessels were surrounded by nested whorls of small, round and uniform epithelioid cells with centrally positioned ovoid nuclei and prominent basal lamina. Mitotic activity was inconspicuous and Ki67 index was <2%. Diffuse immunoreactivity for smooth muscle actin and vimentin was noted, while desmin and S100 stained negative. Final diagnosis of multiple deep-seated solid glomus tumors of uncertain malignant potential was rendered. The pain immediately resolved postoperatively, leading to improved gait and sleep. After an uneventful postoperative period the patient was discharged home and remains symptom-free at six months of follow-up.

**Conclusion:** We have found only 12 similar cases of benign-looking multiple GTs involving deep soft tissues or viscera in English medical literature. Such occurrences are highly unusual, because both multiple and deep-seated solitary GTs occur in completely different clinicopathologic settings. We and several other authors suggest, that that multiple deep-seated GTs might represent vascular seeding of an as-yet unidentified GT downstream of already identified tumors. This remark is contrary to the widely accepted paradigm, that only GTs showing marked nuclear atypia or atypical mitotic figures have metastatic potential.

## **A very rare association of a benign Schwannoma and a high grade NST breast carcinoma**

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**Introduction:** Cancer is characterized by a chaotic growth of cells. A Schwannoma in most cases is a type of benign tumor of the peripheral nervous system and can be recognized by the proliferation of Schwann cells. It is also referred to as neurilemmoma or neurinoma. The chaotical proliferation applies to breast cancer and can be signaled by: changes in shape like lumps or dimpling, fluid coming from the nipple or patches of skin that have changed color. Being female and over 40-years-old are considered common factors for breast cancer.

**Case report:** A 68-year-old female patient presented to the hospital with a mass in her right breast, in the inferior exterior quadrant. In the past the patient had a mammography, a MRI and an echography. Also, it was noted that the tumor has a BI-RADS of 5 which signals that it is most certainly malign. A biopsy was completed with the extraction of the lump in her breast, with the collection of sentinel nodules, which were negative for tumoral invasion. The diagnosis for this patient is quite unique as it is a combination of a malign tumor such as a NST invasive carcinoma and a benign one, a Schwannoma. On the collected sections we can see a biphasic aspect constructed out of hypercellular zones known as Antoni A with myxoid patches. The proliferation is composed of elongated cells with a fusiform shape that have reduced cytoplasm and hyperchromic nuclei. The tumoral cells are positive for S100, CD68 and CD34. These support neural differentiation, when combined with the morphology is characteristic of a breast Schwannoma. The Ki67 index is 3%. The NST invasive breast carcinoma was graded using the Nottingham score, which revealed the following results: 3 points for tubule formation, 3 points for nuclear pleomorphism and 2 points for mitotic activity. This test had a total score of 8, resulting in a grade 3 of malignity which is characterized by poorly differentiated cells and negativity for HER2. On the section it can be observed that there is: reduced inflammation (low TILS score), fibrosis, no necrosis, a lympho-vascular invasion with a perineuronal one as well as calcification.

**Conclusion:** A Schwannoma is a relatively rare neoplasm derived from Schwann cells of the nerve sheath. This association of Schwannoma and a breast carcinoma makes up for probably under 40 cases worldwide. Schwannomas occurs frequently in the neck and head region, which shows the particularity of this case, in which it arises from the intercostal nerves.

## **Intradural lumbar disc herniation: A report of two cases and review of the literature**

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**Introduction:** Intradural or intraradicular disc herniation is a rare condition which comprises 0,27% of all herniated discs. It occurs when the fragment of herniated disc tears the spinal dura mater and locates in the intradural extramedullary space. Its pathomechanism still remains unclear. Most cases are diagnosed intraoperatively since in preoperative radiological examination it is rarely possible to distinguish from simple intervertebral disc herniation. Herein we describe two cases: of intraradicular and intradural lumbar disc herniation with review of the literature regarding possible pathogenesis and diagnostic features.

**Case reports:** In June 2019 a 35-year-old male patient was admitted to the Neurosurgery Clinic of University Clinical Centre in Gdansk for a planned surgery of a L5-S1 disc herniation. He presented with severe low back pain and right lower limb radiculopathy of 5 weeks duration. Neurological examination revealed weakened right ankle dorsiflexion, diminished sensation, positive Laségue's sign and decreased ankle reflex on the right side. Magnetic resonance imaging showed a large right posterolateral disc herniation at L5-S1 level causing a significant mass effect on the dural sheath and the proximal root of the first sciatic nerve (S1). There was no suspicion of intradural herniation. Intraoperative exploration revealed a sequester penetrating to the S1 nerve root. Discectomy along with sequestrectomy of intraradicular fragment were performed. Later intraoperative and postoperative course was successful.

Second case is a 57-year-old woman admitted to the same Clinic in July 2016 for L4-L5 disc herniation surgery. The patient was reported with pain in the lower back and right lower extremity along with sensory deficit, numbness and decreased muscle strength. A major disc prolapse at the L4-L5 level was disclosed on magnetic resonance imaging. During surgery an unexpected intradural penetration of the herniated disc was revealed. Discectomy and durotomy with extirpation of the intradural fragment were performed. Apart from mild infection of the postoperative wound subsequent course of the case was uneventful.

**Conclusions:** Intradural or intraradicular disc herniation is a rare complication of common pathology. Presented cases show the diagnostic difficulty of this disease. Most of the patients are diagnosed only intraoperatively making a challenge for surgical planning and increasing the risk of unpredictable complications and unnecessary postoperative neurologic deficit. The definite preoperative diagnosis is possible only if radiologic findings are read with a high level of suspicion of this rare pathology. Current literature reports several clinical and radiological features that could suggest intradural penetration but more such cases need to be analysed to set an effective key to identification of this condition.

## **Total hip arthroplasty in treatment of osteoarthritis in patient with Scheuermann's disease and significant pelvic bone loss**

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**Introduction:** Total hip arthroplasty is known as the most effective treatment of hip osteoarthritis. However, in order to achieve the desired outcome a proper implant has to be selected, taking into account patient's anatomical and biomechanical characteristics. These factors may vary because of patient's history and environmental impact but also his congenital traits. Sometimes the implant has to be altered in some way or even custom made in order to meet patient's expectations.

**Case report:** A 58-year old patient suffering from hip arthritis was admitted to the orthopedic department to undergo a total hip arthroplasty procedure. He was previously denied this kind of treatment twice because of unresponsive high blood pressure values and probable difficulties that could occur during the surgery due to the state of his pelvic bones. Apart from hypertension patient also suffers from diabetes. Years ago, he was diagnosed with Scheuermann's disease which resulted in significant spinal deformations and as a consequence also short stature. The physician in charge tried to find a connection between the Scheuermann's disease and the poor state of patient's hip. It is well known that patients with this condition have a forward pelvic tilt caused by excessive kyphosis, what results in tight hip flexor muscles and hamstrings. These factors cause a significant imbalance within the hip joint leading to a cartilage overuse. What is more a literature research revealed a possible genetic connection between Scheuermann's disease and hip dysplasia which is also a risk factor of future osteoarthritis. Radiographic analysis of patient's hips showed a dysplastic joint with severe arthritis and significant bone loss within the acetabulum region which ruled out the standard arthroplasty procedure. Two treatment options were considered. One of them being a custom-made implant which would fit patient's needs but is also very time and cost demanding in terms of implant preparation. Another option was usage of a revision cup implant with an augment that would help secure the cup within the healthy parts of the pelvis. After pinpointing patient's priorities, the second option was chosen and successfully applied. The treatment used in this case met patient's specific anatomic characteristics and most importantly his needs- alleviated pain and restored the hip function.

**Conclusion:** Millions of total hip replacements are carried out each year worldwide and every single one is different. This fact pushed implant manufacturers to design prosthesis suitable for everyone's needs but in order to be able to use them surgeons must stay up to date with the advancements of the hardware. What is more, proper radiological and clinical examination is the key to adequate implant selection. Another conclusion drawn from this case is that early treatment of congenital postural disorders is crucial for prevention of long-term complications, sometimes appearing in seemingly not related organs.



## **An unusual case of a joint contracture after a laceration wound of the knee**

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**Presenting author:** Damir Misura

**Tutor:** MD Ana Aljinovic

**Introduction:** We present a case of a patient that experienced unusual joint contracture and pain of the knee subsequently to a relatively mild tool-related trauma.

**Case report:** The patient came to the ER of the Clinical Hospital for Traumatology in November 2020. The diagnosis of a contused lacerated wound of the medial part of the knee was set. Edema of the soft tissues was present with effusion of the suprapatellar recess. No neurocirculatory abnormalities were discovered and radiographic images showed no bone fracture. Primary wound treatment was performed and antibiotics and analgesics were prescribed. After a few hours, the wound started to bleed, so a wound toilet was carried out and a new bandage was set. The patient was discharged but pain and limitation of the movement started to develop progressively. Roughly a month and a half later, the diagnosis of a contracture of the left knee was set (the range of motion regarding the flexion was limited to 60 degrees). The patient also reported intense pain during activities like walking up the stairs or driving a car. Individual kinesiotherapy was indicated but it showed no improvement so MR imaging and an appointment with an orthopedic surgeon were set. The surgeon decided to perform an arthroscopy with the aim of adhesiolysis. Afterwards, the contracture was still present although the range of motion increased (90 degrees). Severe pain was present at the end of range of motion and on palpation in the scar area. Conservative treatment was continued.

**Conclusion:** This is an interesting case where we can perceive unexpected symptoms such as contracture and pain in the knee after an injury that usually has no complications. These symptoms probably wouldn't have developed if physical therapy had started earlier. Although kinesiotherapy and surgery were beneficial, the complete recovery is not achieved and further physical procedures are mandatory.

## **The PRECICE Intramedullary Limb Lengthening System as the alternative treatment for limb length discrepancy.**

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**Introduction:** External fixators used as limb lengthening treatment method is known to be associated with several complications such as local infection, soft-tissue tethering, deformity and fracture of the regenerated bone which may result in pain and patient's distress. Intramedullary self-distracting nails seem to be the alternative diminishing the risk of complications. Using external remote control device (ERC), which is placed on a skin surface the intramedullary implant and the bone segment are lengthened at the same time. Currently, the PRECICE system is described by the literature outcomes as the most reliable and accurate tool for distraction osteogenesis in limb lengthening.

**Case report:** The case of a female patient, who was 11 years old when treatment due to limb length discrepancy began. It was a sequela of congenital vascular malformations affecting the left lower extremity. Firstly, the patient was treated using non-surgical intervention, which was shoe lifts. As the length disproportion between the limbs increased, an eight-plate guided growth system was applied to temporarily block the physis in the area of the left femur. Complications such as limited range of the knee flexion and blockage of the iliotibial band led to its reimplantation. Finally, it was removed after the growth plates fusion. Continuing limb length discrepancy treatment the PRECICE intramedullary limb lengthening system was used aiming to length the right femur (September, 2019). Until the lengthening process was completed (June, 2020), it ran without any complications.

**Conclusion:** During and after the lengthening process using the PRECICE system no complications were observed, except for short-term and severe pain in the right lower limb. Simultaneously, satisfying results of the lower limb length discrepancy treatment were obtained. Both case and literature outcomes allow concluding that this method offers many advantages over other methods, especially external fixators. However, the statement requires confirmation basing on more effective medical procedures with the magnetic intramedullary implant - PRECICE SYSTEM.

## **A case study of repeated fractures in the context of restoring spine stability.**

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**Tutor:** Prof. Maciej Radek, MD PhD Maciej Wojdyn

**Introduction:** Spine stability is essential to protect nervous structures. It may be disturbed by several factors. One of the most observed in neurosurgical practice is trauma, especially when repeated. We present the case of multiple fractures that required multi-level stabilization on a very large scale.

**Case report:** A 60-year-old female patient with congenital Th6 hemivertebrae and numerous comorbidities, including osteoporosis, was admitted to the Department of Neurosurgery, Spine and Peripheral Nerves Surgery because of destabilization at the level of Th6 after a fall. The patient reported many falls from her body's height in the past year. Initial treatment with the usage of a corset remained insufficient. Because of the spastic paresis of the lower extremities, Th6 laminectomy combined with partial vertebrectomy of Th6 and transpedicular short-level stabilization (Th5-Th7) was performed. The patient improved neurologically.

The next fall has led to the fracture of stabilizing screws. The treatment option was the extension of previous stabilization using Th4 and Th9 laminar hooks and the usage of autogenous bone. The third fall (down the stairs) resulted in a complicated fracture of the ribs and the neck of the humerus. The main neurosurgical complication was again the instability of the thoracic spine and deeper paresis of the lower extremities. The patient was re-operated, and the full vertebrectomy of Th6 with vertebral prosthesis and multi-level stabilization (Th2-Th3-Th4-Th7-Th8-Th9-Th10) has been made. The next fall from her body's height one year later has led to the compression fracture of Th12. This condition required extension of the stabilization to the next levels, down to S1. This was possible due to use of unique implants, which allowed connecting two systems of stabilization – the previously implanted and the new one.

**Conclusions:** This case shows the very big problem of aging spine and complications of repeated falls. We present modern possibilities of treatment, which include use of new implants and neuronavigation.

## **O-Arm and Capstone usage in posterior lumbar interbody fusion - a case report of an elderly patient**

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**Introduction:** Degenerative disease of the spine is the most frequent cause of back pain among elderly patients. It affects intervertebral discs and joints with their ligaments at every part of the spine but mostly at lumbar level. Typical treatment follows, after pharmacotherapy and physiotherapy, invasive surgery to relieve pressure on the nerves in the spinal canal by decompression and followed by obligatory stabilization.

**Case Report:** A 76-year-old patient, diagnosed with a degenerative disease of the lumbar spine, reports severe pain (9/10), which radiates to the right gluteus and right foot. The patient presented with neurological claudication (within 500m walking) and anteversion with significant reduction of flexion of the feet and a recurrent weakness of the right limb. Symptoms have been present for 5 years and for the last 2 years they have exacerbated. He was admitted to the hospital in January 2021 and magnetic resonance imaging revealed L4/L5 spinal stenosis, spondylolisthesis and discopathy. Decompression through laminectomy and facetectomy was performed to liberate the spinal canal. Discectomy was made and the disc was replaced by posterior lumbar interbody fusion (PLIF) with CAPSTONE – MEDTRONIC. Eventually, pedicle stabilization was performed, and the operation's hollow was secured with autograft's bone elements to achieve spondylodesis. No complications after surgery were observed. Neurological examination revealed no paresis and the patient reported a complete absence of radicular pain. On the 2nd day the patient was set in motion and discharged from the hospital at the 3rd day after surgery.

**Conclusion:** The longer the lifespan the more frequent the degenerative changes, so the improvement of the treatment and life quality in elderly patients is vital. Advanced age, comorbidities and aggravation of the degenerative changes increase the risk of the surgeries. However, use of O-ARM and modern implants to perform a wide stabilization may show that new methods of a during-surgery navigation and a spondylodesis decrease the risk of the surgery.

## **Irreducible L5/S1 spondyloptosis in over 20 years after neglected trauma treated with modified Grob's technique - case report.**

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**Tutor:** MD PhD Bartosz Godlewski

**Introduction:** Spondylolisthesis, defined as complete slippage of the vertebral body above in relation to the vertebral body below, is extremely rare. In the classification presented by H.W. Meyerding in 1938, it is described as grade V spondylolisthesis with >100% slippage. It is a condition most often resulting from high-energy trauma or congenital dysplasia and affects predominantly young people. It is extremely rare for a patient to present with ossified spondylolisthesis several decades after trauma.

**Case Report:** An obese, 62-year-old man presented to the spinal surgery sub-unit for severe low back pain (NRS 6/10) radiating to the lower limbs and associated severe neurogenic claudication (14 pts N-CLASS). The Oswestry Disability Index on admission was 24 points. The MRI scan provided by the patient showed a L5/S1 spondyloptosis with distortion of the vertebral bodies, displacement of the L5 vertebral body in front of the S1 vertebral body, critical stenosis of the spinal canal and intervertebral foramina at the L5/S1 level. A preoperative CT scan was performed, in which, in addition to the above, a significant degree of bony fusion in the L5/S1 area was observed. The surgical treatment applied included decompression and stabilisation at the L3-S1 levels with pediculo-body fixation using the Grob's technique at the L5/S1 level. The patient's complaints resolved 48h after surgery and he returned to full function 2 months after surgery.

**Conclusion:** Spondyloptosis is typically treated by reduction and stabilisation, often with L5 corpectomy. This technique was developed by Gaines and Nichols on a patient population with dysplastic spondyloptosis. The average age of the patients in their study was 22 years and the procedure, which was divided into 2 stages, placed quite a burden on the patients. The Gaines and Nichols method, due to the need for anterior approach, is a method that induces a large blood loss (approximately 2100 ml). In our case, due to the obesity and age of the patient, this technique was not suitable. Another method, sacral dome osteotomy, was also not feasible due to bony union between L5 and S1. The pediculo-body fixation technique used in this case and described by Grob was characterised by efficiency and low blood loss. Insertion of the screw through the S1 pedicle into the L5 vertebral body allowed decompression of the dural sac without inducing instability. Combined with stabilisation, this produced a spectacular result in our patient. The authors, after a thorough review of the literature, conclude that in elderly patients with spondyloptosis, fixation with the Grob's technique, without reduction, is the most effective.

## **Fournier's gangrene after COVID-19 infection – when it rains, it pours**

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**Presenting author:** Mantas Fabijonavicius

**Tutor:** MD PhD Arnas Bakavicius

**Introduction:** Fournier's gangrene (FG) is a rare, aggressive and rapidly progressive necrotizing fasciitis of the genital and perineal tissues that typically affects males over the age of 50 years old. It is thought to be caused by a polymicrobial infection. Overall incidence of FG is about 1.6/100,000 of males with mortality rates 20% - 40% in majority of studies and even reaching 88% in some.

**Case Report:** 37 years old male patient with no significant past medical history reported to the emergency room complaining of painful swelling scrotum and pain in the perineal region. Patient's symptoms had started seven days prior to presentation but had progressed rapidly in the preceding twenty-four hours. Patient had difficulties urinating and complained of weakness and low blood pressure. The patient had a history of COVID-19 infection 11 days prior to this current presentation. There was no history of diabetes mellitus or any recent trauma. Vital signs taken on admission revealed a blood pressure of 105/70 mmHg, pulse of 110 beats per minute, body temperature of 37°C and oxygen saturation of 91% with 5l of O<sub>2</sub> through nasopharyngeal tube. On physical examination, the patient had diffuse edema of the scrotum and penis with areas of skin discoloration. Laboratory analysis revealed CRP 410.2 mg/l, procalcitonin – 18.1 mkg/l. Based on the history, physical examination laboratory analysis, a diagnosis of Fournier's gangrene was made. Patient was then transferred to ICU due to sepsis and septic shock. An emergent urology consultation was obtained. After initial clinical stabilization, patient was immediately referred to the surgical theatre for debridement of the scrotal and penile skin and soft tissues. During the whole treatment, the patient underwent multiple incisions and necrectomies. Cultures from perineum were positive for A.baumannii, E.coli, and Staph.pyogenes. Therefore, intravenous broad-spectrum antibiotics of: Tienam (Imipenem and Cilastatin), Colistine, Amoxiclav, Metronidazole, Tazocin were given following adequate cultures. Eventually, when advancement of necrosis was stopped and wounds were clean, the patient underwent multiple reconstructive surgeries by plastic surgeons. The patient was discharged after 94 days in hospital.

**Conclusion:** Fournier's gangrene is a urological emergency with a high mortality rate. It requires early recognition, quick actions of a multidisciplinary medical team. It is best to start treatment with broad-spectrum antibiotics on presentation and proceed with complete, early and extended surgical debridement.

## **An unusual case of chest pain and shortness of breath: pectus excavatum**

Monika Savičė

Vilnius university the faculty of medicine

**Presenting author:** Monika Savičė

**Tutor:** MD PhD Vytautas Jovaiša

**Introduction:** Pectus excavatum is a congenital abnormality, that causes a deformity of the sternum and the rib cage due to unbalanced costochondral hypertrophy. It occurs mostly in boys, with a prevalence of 1/1000 and frequently family members are also affected. In majority of cases, it is a harmless condition with no clinical significance and is usually diagnosed for newborns and becomes more obvious for teenagers. In more severe cases signs can be not only cosmetic, but also difficulty breathing, chest pain and it can even lead to serious cardiac symptoms, in these cases a surgery is needed to relieve the symptoms and restore the normal shape of the ribcage.

**Case report:** A 24-year-old female patient presented to the centre of pulmonology and allergology (2019-05-08) with a 2-month history of chest pain and dyspnoea. The patient has contacted her general practitioner for several times before that and have been prescribed with Ipratropium Bromide/ Fenoterol inhaler and diclofenac (NSAID), this drug treatment had only temporary effects and did not relieve the symptoms completely. On 2019-05-03 patient was consulted by a pulmonologist in a primary care centre where a chest x-ray showed infiltration in the right middle lobe and the right lung root, then Co-amoxiclav 500/125 mg per os was prescribed to treat the dissatisfactory diagnosis of pneumonia of unknown cause, ten days later x-ray showed no positive dynamics and cefuroxime 500mg was administered. With no changes in the chest x-ray and the patient's symptoms, she was sent to a pulmonology department in the tertiary referral hospital.

Here her physical examination findings were inconclusive and an abnormal chest x-ray prompted further work up with a CT scan and bronchoscopy. Bronchoscopy revealed a narrowed right middle lobe bronchus. Chest CT scan showed chest wall deformity – pectus excavatum, with a Haller index of 5.6 (normal range is 2), a compressed middle lobe and heart displacement to the left. Then the patient consulted with a thoracic surgeon and a Modified Ravitch procedure was advised as the only treatment method. In 2019-07-15 the surgery has been done and the patient made an uneventful recovery, without any complications. The two metal bars were removed two years later in 2020-12-29.

**Conclusion:** Pectus excavatum may not always be as harmless as it seems. This case history suggests a causal relation between pectus excavatum and symptoms such as chest pain, shortness of breath and palpitations. From a practical viewpoint this means that detection of a pectus excavatum when examining the patient should not be neglected and must be included in differential diagnosis if a patient is present with an unexplained palpitation, dyspnoea, chronic fatigue or ventricular extra systoles or/and atrioventricular nodal tachycardia.

## A 17-year-old boy with spontaneous pneumothorax- case report

Wiktoria Izdebska, Wiktoria Izdebska

Medical University of Białystok

**Presenting author:** Wiktoria Izdebska

**Tutor:** MD PhD Ewa Matuszczak, Prof. Wojciech Dębek, MD PhD Ewa Matuszczak

**Introduction:** A spontaneous pneumothorax is an occurring pneumothorax in a patient who does not show signs of any underlying disease or trauma. It is most likely caused by the formation of a bleb, followed by its rupture, often linked to a rapid growth of adolescents.

**Case report:** A 17-year-old boy was admitted to an Emergency Department in a territorial hospital with a cough followed by dyspnea. He was diagnosed with spontaneous pneumothorax on the basis of a diagnostic chest x-ray. After admission he was treated with suction drainage to the right pleural cavity. Due to the lack of improvement of his state, the boy was sent to the Department of Pediatric Surgery and Urology in the University Children's Clinical Hospital in Białystok. On the admission a constant leakage of air in chest drainage was observed. CT scan revealed pneumothorax on the right side of chest and showed ruptured pleural blebs at the top of the right lung. On the following day the boy was treated with a thoracotomy and resection of the right upper lobe. The patient was discharged home in good general state.

**Conclusion:** Primary spontaneous pneumothorax (PSP) commonly occurs in tall, thin, adolescent men. There is still a lack of consensus in the diagnostic approach and treatment strategies for this disorder. The chest computed tomography (CT) has been more commonly used in diagnostics and helps to plan further management strategies. The development of video-assisted thoracoscopic surgery (VATS) has changed the management strategies of PSP due to its minimal invasiveness and high effectiveness for patients with PSP."



## **Retroperitoneal well-differentiated recurrent liposarcoma**

Timar Renata

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**Presenting author:** Timar Renata

**Tutor:** MD Horațiu Sabău, MD Damian Vasile, MD Bartha J. Róbert, Prof. Cotoi Ovidiu Simion

**Introduction:** Liposarcoma is a common type of soft tissue sarcoma, which occurs most commonly in the extremities (52%), followed by the retroperitoneum (19%), characterized by their large growth. A well-differentiated liposarcoma with retroperitoneal location has a slow and painless growth, usually asymptomatic until it is large enough to compress the surrounding organs. It is composed of proliferating mature adipocytes.

**Case report:** A 65-year-old female presented herself at the hospital with abdominal pain, transit disorders and weight loss. After all investigations at CT-scan it can be observed a retroperitoneal tumor apparently well delimited of 240x250 mm and the only treatment was surgical resection. At grossing it was observed a tumoral mass of 230x235x130 mm, 3200g, covered by a fine capsule and apparently macroscopically intact. Section wise, the tumor presented a yellowish color with clouded white nodules. This nodular areas show small areas of fibrosis, with a fasciculated aspect and a well delimited nodule presenting homogenous aspect, yellowish colour and a diameter of 35 mm. On the examined fragments a proliferation was found composed predominantly of mature adipocytes of different sizes, among which can be observed cells with cyto-nuclear marked atypia with increased irregular size nuclei and hyperchromic chromatin, pleomorphism. Between mature adipocytes it can also be observed a focal group of multivacuolated lipoblasts and reduces septal fibrosis. The stroma has a myxoid and a fibrous aspect. The histological gradation (FNCLCC) shows: Tumoral differentiation score: 1, Mitotic activity: 1 (Under 9 mythosis /10 HPF), Tumoral Necrosis: 0. The total score is: 2, which represents grade 1: well differentiated.

**Conclusion:** Well-differentiated liposarcomas located in superficial areas can be found early and have a better outcome for the patients, showing a 5-year survival rate of 95.5%, rather than the same type of tumors located in areas where excision is no longer possible, such as the retroperitoneum. Recurring surgical therapy can be challenging but remains the only treatment because these tumors are classically chemo- and radio-resistant. That patients diagnosed with retroperitoneal tumors present a lower survival rate of 63,9%.

## SMALL BOWEL DOUBLE METASTASES OF MALIGNANT MELANOMA

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**Tutor:** MD Şincu Mihaela, MD Georgescu Rares, MD Bartha J.Robert Cotoi, Prof. Ovidiu Simion

**Introduction:** Originating from the pigment-producing cells known as melanocytes, cutaneous melanoma is one of the most aggressive skin tumors with a high tendency to widespread distantly, usually causing metastases to the lymph nodes, liver and brain. Although, malignant melanomas show an unusual and rare predilection to metastasize to the gastrointestinal tract and they are clinically undetectable in the early stages.

The aim of this report is to emphasize the paths of the metastatic process on a patient with malignant melanoma through all 5 years since primary diagnosis.

**Case report:** A 61-year-old female was admitted to General Surgery Department, Clinical County Hospital of Târgu Mureş in 2017 for a right thigh pigmented lesion that required surgical removal. The histopathological result showed a tumoral proliferation of malignant melanocytes with high atypia, positive for the immunohistochemical staining with S100, Melan A and HMB45. The excision of the sentinel lymph node was later performed and the result was positive for melanoma. Two years later, in 2019, she presented with another similar lesion adjacent to the first one, for which surgery was again performed. The result was positive for melanoma and the histological report mentioned the tumoral invasion of the resection margin. Another surgery was performed in order to clear the remaining tissue of tumoral cells, but the margins were again positive. After the third excision of the tissue, the resection margins were clean, but secondary melanoma nodules were observed in the specimen. Later that year, the patient presented with adenopathy in the inguinal region and an excision of the tissue was performed, showing no lymph nodes, but residual nodules of melanoma, confirmed with the following immunohistochemical markers: SOX10, S100, HMB45 and Melan A, along with Ki 67 (proliferation index with a value of 20%). The latest surgical procedure that was performed on the patient in 2019 was represented by a right iliac lymphadenectomy that was suspected of tumoral invasion. The histological analysis confirmed the presence of malignant melanocytes in all the lymph nodes removed.

During the follow-up, in 2021, the patient presented with two tumoral masses in the small intestine. A required colonoscopy was performed, followed by segmentary bowel resection. Both the tumoral masses were represented by melanoma, confirmed with the immunohistochemical markers previously used.

**Conclusion:** The particularity of this case consists in the progressive patient's presentation over the years. This highlights the difficulty of managing the disease due to its aggressive behavior. Target therapy with BRAF inhibitors is indicated in order to improve patient's outcomes and it is used for tumors with BRAF gene mutation.

# Thoracic spinal tuberculosis with myelopathy complicated by *Cutibacterium acnes* surgical site infection.

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**Presenting author:** Piotr Madej

**Tutor:** MD Michał Krakowiak, Prof. Habil Paweł Stoniewski

**Introduction:** While spinal tuberculosis remains a rare disease, it constitutes nearly half of all musculoskeletal forms of tuberculosis. In the Western world it is mostly diagnosed among adults who emigrated from endemic regions. A case of thoracic tuberculosis with additional complications is reported.

**Case report:** A 24-year-old male was admitted to the Emergency Department (ED) due to pain in the lumbosacral spine, anuria, progressive lower extremities weakness and reduced sensation from Th7 dermatome. Neurological examination revealed lower extremity paresis, positive Lhermitte sign and Romberg's positive test. Chest CT scan presented a Th5 compression fracture with an abscess of the prevertebral Th4-Th6 space penetrating to the spinal canal causing stenosis. The patient was qualified for an extended Th5 laminectomy, removal of available pathological masses and percutaneous Th7 transpedicular fixation. During surgery, bradycardia was noted on the basis of spinal shock. Intraoperatively acquired specimens confirmed tuberculosis. Pharmacological treatment was employed. Postoperatively, surgical reinspection was performed due to wound infection caused by *Cutibacterium acnes* and *Klebsiella pneumoniae* ESBL. Once neurosurgical treatment was finished, the patient in an overall good condition was moved to a specialized tuberculosis treatment center.

**Conclusion:** Spinal tuberculosis should be always included in differential diagnosis in cases with similar clinical presentation. In this particular case, multiple complications and infections during treatment proved to be a challenge and extended the hospitalization length. Precise diagnostic procedures and cooperation of a multi-specialist team in the spinal tuberculosis treatment is crucial for effective patient care.

## **A rare case of extremely aggressive NST carcinoma of the breast with medullary features**

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**Tutor:** MD Tinca Catalina, MD Andreea Georgescu Rares, MD Turdean Sabin, Prof. Cotoi Simion Ovidiu

**Introduction:** Breast carcinoma is a highly heterogenous disease, with a wide variety of sub-types and presentations. Pure medullary carcinoma represents less than 5 % of the total number of invasive breast carcinomas. A large number of these tumors have BRCA1 gene mutation. Since 2012 WHO has decided to introduce two new entities: Atypical medullary carcinoma and invasive carcinoma of no specific type with medullary features.

**Case report:** A 71-year-old patient presents at the surgical department of the Clinical County hospital Targu Mures for a lump in the left breast that caused the ulceration of the skin. Considering this sign, the patient cannot perform mammography, therefore CT examination is recommended. The CT exam shows the presence of two bilateral tumors, one located in the right breast JCS and the other one in the left breast, SEC level. Both tumors associate axillary adenopathy. After the examination, a fine needle biopsy is performed from the left tumor. The microscopic examination shows the presence of a malignant proliferation with a tubular architecture. It consists of medium-sized tumor cells with eosinophilic cytoplasm and moderate pleomorphism. Alongside, there are areas of syncytial architecture, consisting of round cells with abundant cytoplasm, with vesicular nuclei, visible nucleoli, which presented a high nuclear pleomorphism. These areas of syncytial appearance are surrounded by an increased inflammatory lympho-plasmocitary infiltrate. Immunohistochemically the tumor is triple negative (ER-, PR-, HER2-). The cells which present syncytial architecture show positivity for the CTK8/18, CTK5/6, p63 markers. Thus, following the morphological appearance along with the immunohistochemical profile, the diagnosis of NST invasive carcinoma with medullary features is established.

**Conclusion:** Despite the good prognostic given by medullary breast tumors, extensive lymphonodular involvement presents a more reserved outcome. The introduction of the subtype of NST invasive carcinoma with medullary features came in to the aid of pathologists, in order to be able to diagnose this type of tumor that does not meet all the necessary criteria for a pure medullary carcinoma.

## Managing ureter stenosis- possibilities and limitations

Agnieszka Pietruszka, Krzysztof Szczerbowski

**Presenting author:** Agnieszka Pietruszka

**Tutor:** MD PhD Monika Duda, Prof Janusz Tyloch

**Introduction:** Ureter stenosis is a state in which ureter tube is narrowed in some manner. Sometimes it occurs due to passage of kidney stones and irritation of tissues they can cause. In other cases it is preceded by inflammation of upper urinary tract, tumors or autoimmune diseases. There is a special group of reasons for ureter stenosis on which we have focused on – iatrogenic ones. Surgeries in the ureter area (eg. gynecologic or vascular), radiotherapy or procedures of managing kidney stones may cause such dysfunction. Due to this possibility after the certain medical procedures, patients need to be controlled frequently. We would like to present a case study which shows one of the possible managements of mentioned issue.

**Case report:** Our patient is a forty-seven years old woman who was admitted to the hospital due to the right-sided hydronephrosis. Patient had a previous history of gynecological interventions caused by cervical cancer, and four ureter transplantations ( one left-sided, and three right-sided, last one 2 years before present admission). She was administered by double J catheter. No other intervention was performed. Three months later, patient was admitted again in order to perform uretheroscopic examination of the ureters. It showed stenosis under ureteropelvic junction of the right ureter. Also the double J catheter was replaced. After following six months the patient was hospitalised to remove the catheter and check the the right ureter outflow. After the removal the ultrasonographic examination revealed both the right kidney and ureter widening. Further diagnostic procedures showed obturation of the lower part of right ureter, and pyuria. It was treated with both antibiotics and nephrostomy. Patient was under urological dispensary care for the consecutive four months. Over the next few months patient undergone two attempts of ureter dilatation. Then she was qualified for ureter stenting with 12cm, 10F stent.

**Conclusion:** Stent placement is one of the possible methods ureter stenosis treatment aside from catheter placement and surgical removal of strictured portion of the ureter. It is associated with the lower invasiveness than the surgical methods and lower risk of infection than the long term catheter placement. Considering novel advances in stent cloathing, this method should be taken under consideration as therapeutic option in selected patient group with ureter stonosis.

## Uterine tumor as a diagnostic trap - a case report.

Aleksandra Gładych

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**Presenting author:** Aleksandra Gładych

**Tutor:** MD PhD Gąsiorowska Emilia

**Introduction:** Up to 10% of all uterine sarcomas are endometrial stromal sarcomas. Although it is mainly diagnosed in the age group of 40-50 years old, the number of cases reported in younger women seems to be increasing rapidly. ESSs classification is based on cell morphology and mitotic count into low-grade and high-grade tumors.

**Case report:** A 27-year-old female presented to the Gynecology Outpatient Clinic due to massive uterine bleeding. Ultrasound examination showed extended endometrium with hypoechoic fluid. Abnormal twin pregnancy was diagnosed and patient was admitted to the hospital.  $\beta$ -hCG test was negative. During endometrial abrasion procedure suspicious mass of uterine was found. Assumed to be the stromal myoma. It was treated with GnRH agonist. Histopathological test was not clear due to scanty biopsy material. After three months of observation and hormonal therapy patient underwent a hysteroscopic removal of tumor. Histopathological examination revealed endometrial stromal sarcoma. Additional cytogenetic test was performed and YWHAE-FAM22 gene fusion characteristic for high grade EES was found. After total abdominal hysterectomy with bilateral salpingo-oophorectomy patient underwent combined chemotherapy. Currently hormonal therapy is advised.

**Conclusion:** It is challenge to diagnose ESS correctly. Clinical manifestation is nonspecific, with wide range of symptoms such as abnormal uterine bleeding, pelvic mass or abdominal pain. Well-prepared, representative biopsy material is necessary for correct diagnosis. Cytogenetic tests enable to distinguish low and high grade tumors. A prompt diagnosis and timely intervention are keys to success, especially in oncology cases. Hence, it is necessary to consider this diagnostic despite the nonspecific symptoms even in younger women.

## **CASE STUDY: PAEDIATRICS 1**

**COORDINATORS: Marta Węgierska, Roxana Drygała**

### **Jury:**

Prof. Przemysław Przewratil

MD PhD Joanna Trelińska

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## **Successful treatment with biologics in a paediatric patient with a severe inflammatory skin disease and CARD-14 mutation**

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**Tutor:** Prof. Aleksandra Lesiak, MD PhD Malgorzata Skibinska

**Introduction:** CARD14 (caspase activation and recruitment domain) gene activates a group of interacting proteins known as nuclear factor-kappa-B (NF-κB), which regulates the activity of multiple genes, including those that control the body's immune responses and inflammatory reactions. The role of CARD14 mutations in the pathogenesis of several inflammatory skin conditions was initially described with its identification as a responsible gene at the Psoriasis Susceptibility 2 (PSORS2) locus. So far, those mutations have been associated with psoriasis vulgaris, psoriatic arthritis, generalized and palmoplantar pustular psoriasis, pityriasis rubra pilaris and atopic dermatitis. In 2018 a new dermatological condition, CARD14-associated papulosquamous eruption (CAPE) was described for a group of patients with clinical features of psoriasis and PRP also bearing some resemblance to atopic dermatitis or even ichthyosis. CARD14 mutations in patients with severe forms of autoinflammatory skin diseases are currently a subject of research (POWR.03.05.00-00-z065/17) in our department with the Human Research Ethics Committee approval (number RNN/180/20/KE).

**Case report:** We would like to present a 9-year-old patient who developed skin problems by the age of 2. His diagnoses included psoriasis vulgaris (PV) and pityriasis rubra pilaris (PRP), however no definitive diagnosis was made. Patient presented with well-demarcated pink-red patches and thin plaques involving bilateral cheeks and chin with sparing of the infralabial area and substantial involvement of the trunk and extremities in form of erythema and significant scaling. Histopathological examinations of several skin biopsies revealed features of PV and PRP. He was treated with topical medications, systemic cyclosporine, acitretin, methotrexate and dimethyl fumarate, all with poor response. Genetic investigations revealed CARD14: c.394A>T/- mutation (which to the best of our knowledge has not been reported before) and he was eventually diagnosed with CAPE. He is currently undergoing treatment with TNF-α inhibitor (adalimumab) showing significant improvement of his skin lesions.

**Conclusion:** Mutations of CARD14 are a fascinating and emerging field of research. Published studies indicate a diverse range of disease symptoms associated with CARD14 mutations and it is still unknown whether CARD14 variants are the cause of skin diseases or just predisposing factors. Unfortunately, there is not enough data to establish generally accepted therapeutic guidelines for CARD14 related dermatological problems, however, treatment with biologics shows promising results. Patients with severe inflammatory skin conditions who do not respond to standard treatment should be considered for genetic investigations for CARD14 mutations.



## Is it possible to have two types of diabetes mellitus at the same time?

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**Presenting author:** Martyna Martka

**Tutor:** Prof. Agnieszka Zmysłowska

**Introduction:** Type 1 diabetes mellitus (T1DM) is one of the most common metabolic diseases in children. It has an autoimmune background and according to the latest definition, can be diagnosed in the preclinical period by using the presence of a minimum of two autoantibodies in the serum of patients from the following: islet cell antibodies (ICA), anti-glutamic acid decarboxylase (anti-GAD), insulinoma-associated antigen (IA2), insulin autoantibodies (IAA) and anti-ZnT8 autoantibodies (ZnT8). Another type of diabetes in children and adolescents is monogenic diabetes (MD) which pathogenesis is related to a defect in a single gene. The most common form of MD found in pediatric patients is MODY2. It is an autosomal dominant inherited condition caused by the presence of pathogenic variants in the glucokinase (GCK) gene. The effect of this mutation is to disturb the function of glucokinase, an enzyme that phosphorylates the glucose molecule, resulting in glucosensor dysfunction. Clinically, this type of diabetes manifests with mild hyperglycemia, which often causes that patients have been undiagnosed for a long time.

**Case Report:** Two sisters with diabetes of unknown etiology treated with subcutaneous insulin therapy were referred from the Diabetes Outpatients Clinic to the Genetic Outpatients Clinic. It is known from the medical history of the patients that both were initially asymptomatic and diabetes was diagnosed based on an oral glucose tolerance test (OGTT) performed due to fasting hyperglycemia found in routine laboratory tests. During the diagnostic process an older sister developed diabetic symptoms such as polyuria and polydipsia. Based on the presence of positive autoantibodies (ICA titer – 80 IU JDF and anti-GAD titer - 86.05 U/ml) she was confirmed as having T1DM. At the same time, the patient was observed to have a reduced fasting C-peptide level (0.218 ng/ml), which indicates of impaired insulin secretion disorders. Interestingly, a younger sister had negative results of all autoantibodies characteristic for T1DM and normal insulin secretion. Because of the above laboratory results and positive family history (father and grandmother of the sisters have diabetes) the patients were qualified for genetic testing for MD. As a result of molecular analysis, which confirmed the presence of heterozygous (single) pathogenic variant in the GCK gene, both patients were diagnosed with MODY2 diabetes.

**Conclusion:** Based on the results of genetic testing, the younger patient was diagnosed with MODY2 diabetes, which allowed her to discontinue insulin therapy and begin metabolic control of diabetes through a low glycemic index diet and physical activity. The older patient is a classic example of dual (hybrid) diabetes including, in this case, T1DM and MODY2 diabetes, which is an indication for continued insulin therapy.

## **Case report: Wolfram-like syndrome - another face of a rare disease in children**

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**Presenting author:** Julia Grzybowska

**Tutor:** Prof. Agnieszka Zmysłowska

**Introduction:** The presence of two pathogenic variants in the WFS1 gene leads to the occurrence of a rare genetic disease in children - Wolfram syndrome (WFS), also known as DIDMOAD syndrome, which includes insulin-dependent diabetes mellitus (DM), optic atrophy (OA), diabetes insipidus (DI) and deafness (D). These symptoms are also accompanied by a number of other neurodegenerative symptoms. However, the presence of a single mutation in the WFS1 gene results in a number of other autosomal dominant inherited diseases, including Wolfram-like syndrome (WFS-like).

**Case report:** A 10-year-old boy was referred to the Genetic Outpatient Clinic with suspected WFS. From the medical history it is known that the hearing screening test performed in the neonatal period (Transient-Evoked Otoacoustic Emission - TEOAE) was abnormal. As a result of further diagnostics, the boy was confirmed to have bilateral cochlear hearing loss and cochlear implants were inserted. At 5 years of age, the patient developed a decrease in growth rate. Laboratory tests revealed short stature due to somatotropin hypopituitarism and growth hormone therapy was initiated. Six months later, during this therapy, diabetes mellitus was diagnosed and subcutaneous insulin therapy was initiated. Diabetes mellitus was classified as type 1 diabetes due to the presence of anti-GAD (anti-glutamic acid decarboxylase) autoantibodies. At the age of 8 years, the patient was observed to have decreased visual acuity. Ophthalmologic examination revealed bilateral visual impairment, astigmatism, and optic atrophy based on optical coherence tomography (OCT) result. Genetic analysis did not confirm WFS syndrome in the boy, but identified a single pathogenic de novo variant in the WFS1 gene, which confirmed WFS-like syndrome. Currently, the patient is under the care of an endocrinologist, diabetologist, ophthalmologist, audiologist and also psychologist because of mood disorders.

**Conclusions:** In the early stages of diagnosis, WFS-like syndrome may be confused with WFS because of the similar symptoms and low incidence of both diseases. This should prompt physicians to pay attention to symptoms that may collectively indicate a genetic disorder and refer patients to specialized clinics that can provide advanced testing and coordinate treatment. Patients with rare genetic syndromes require multidisciplinary care and access to expensive equipment such as, in this case, cochlear implants and insulin pumps.

## The new challenge of the obesity epidemic: diabetes type 1,5 among children - case report.

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**Presenting author:** Dominika Rynkiewicz

**Tutor:** MD Anna Wołoszyn – Durkiewicz

**Introduction:** The prevalence of diabetes mellitus type 1,5 and 2 among children have been rising in past years due to inappropriate diet and lifestyle. The epidemic of the obesity and reluctance to do physical exercises lead to insulin resistance in youths. Moreover, increased cholesterol and triglycerides levels, elevated liver function test parameters and gestational diabetes are the significant risk factors of DM 1,5 and 2. Additionally, in patients with diabetes type 1,5 the autoimmune disorder occurs simultaneously. Depending on which component of the diabetes type 1,5 dominates temporarily, symptoms and clinical picture may be different.

**Case report:** A 17 years old female with a history of DM 2 since 10 years old and obesity since 1 year old, was admitted to the Pediatric Intensive Care Unit with somnolence, ketoacidosis (pH 6,85, HCO<sub>3</sub> 1,6 mmol/l, BE -33,8 mmol/l), presence of Kussmaul breathing, tachycardia and lower limbs edema. The patient was overweight (70 kg), dehydrated, with visible acanthosis nigricans on the neck. The symptoms of polydipsia, polyuria and nycturia have been present for 3 weeks, alongside the upper respiratory tract infection. The further evaluation revealed hypoalbuminemia, HbA1c 16%, anti-GAD 237 IU/ml, anti-IA2 12,4 IU/ml, hypothyroidism and hypercholesterolemia 200 mg/dl, TG 192 mg/dl, D-dimers 1200 U<sub>g</sub>/l. Metformin was replaced by Abasaglar and Humalog as a multiple daily dose injections therapy.

**Conclusion:** Diabetes type 1,5 was diagnosed and the patient was discharged with the advice to change her diet and to implement physical activities into her daily routine. The diagnosis and management of the DM 1,5 is slightly different from the DM 1, as a result pediatricians should evaluate their approach accordingly to the patient's symptoms. To efficiently prevent the increasing prevalence of DM 1,5 parents and doctors should put particular efforts into protecting children from obesity, which is the main modifiable risk factor.

## **Necrotizing enterocolitis as first clinical presentation of long-chain hydroxyacyl-CoA dehydrogenase deficiency**

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**Presenting author:** Vivien Kocoń

**Tutor:** MD PhD Ewa Burchardt-Kroll

**Introduction:** Long-chain hydroxyacyl-CoA dehydrogenase deficiency (LCHADD) is a rare, autosomal recessive metabolic disorder of fatty acid oxidation and ketogenesis. Accumulation of toxic long-chain acylcarnitines in LCHAD deficiency may cause severe neonatal lactic acidosis, cardiomyopathy, and hepatic dysfunction. Patients may also manifest chronic weakness, pain, as well as recurrent rhabdomyolysis. Necrotizing enterocolitis (NEC) is probably the most serious gastrointestinal disorder occurring in neonates. The typical presentation is that of a preterm infant beyond the first week of age on substantial enteral feeding who suddenly presents with gastrointestinal symptoms. The precise mechanism for initiation of the inflammatory cascade in NEC is still unknown. Multiple factors appear to be involved, including hypoxia, acidosis, and hypotension, which may lead to ischemic damage of the mucosal barrier of the small intestine.

**Case Report:** The patient, a girl, was the first child of Caucasian parents. The pregnancy was complicated by pregnancy-induced hypertension, oligohydramnios and intrauterine growth retardation (IUGR). The pregnancy was therefore terminated at 29 weeks of gestation by caesarean section because of acute life-threatening symptoms. The neonate was born in a state of severe asphyxia, with a birth weight 990g. APGAR scores were 1, 1 and 3 after 1, 5 and 10 min, respectively. The patient was intubated in the delivery room in the first minute of life, received a dose of endotracheal adrenaline and a heart massage was performed. She was admitted to the neonatal intensive care unit. Tests for congenital metabolic defects were conducted which revealed abnormalities indicating a disorder of beta-oxidation of fatty acids- LCHAD. A decompensation prevention was implemented - constant infusion of 10% glucose. On day 23 a sudden clinical deterioration suggested necrotizing enterocolitis. Ultrasound and radiograph of the abdomen confirmed the suspicion of the disease and revealed a gut perforation as a complication of the NEC. A laparotomy was performed, during which the appendectomy with abscess was removed.

**Conclusions:** LCHAD is expressed not only in myocardial tissue, but also abundantly in the foetal lung and gut, LCHAD deficiency during intrauterine life may interfere with normal development or maturation of the foetal intestine. In the gut, this might result in decreased mucus synthesis, decreased intracellular junction integrity and increased permeability, both potentially related to the development of NEC. Therefore, long-chain hydroxyacyl-CoA dehydrogenase deficiency might potentially be a risk factor for developing NEC in neonates. However further research should be carried out in this field.

## **Pediatric patients with fever – difficulties in diagnosing Crohn’s disease during COVID-19 pandemic: two case reports**

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**Tutor:** Prof. Aneta Krogulska

**Introduction:** Fever of unknown origin is a clinical syndrome where repeatedly recurring fever (38°C) lasts more than 3 weeks without any known cause, despite 1-week routine diagnostics. Pyrexia in pediatric patients is mostly caused by acute and chronic infections, autoimmune disorders or malignancies. In year 2020 COVID-19 pandemic had significant impact on healthcare system worldwide. Access to many diagnostic procedures has been limited and in many cases visits at general practitioner's have been replaced by telephone consultations. The aim of the study was to highlight the atypical clinical picture of Crohn’s disease, in which the first and only symptom was fever, which appeared during the COVID –19 pandemic.

**Case report:** Case I: A 9 year-old girl was admitted to our Department due to fever up to 39°C interchangeably with subfebrile temperature lasting for about 6 weeks. No other symptoms were reported. Initially, pharyngitis was suspected and she was treated with antibiotics by family doctor via telephone consultations without any significant improvement. Due to persistent fever she was admitted to the hospital, where SARS-Cov 2 infection and other causes of fever were excluded. At this time, the loose stools were also observed. Laboratory tests results showed anemia, thrombocythemia and elevated serum and fecal biomarkers of inflammation. Based on the history, test results and endoscopy, she was diagnosed with Crohn’s disease and treated with systemic steroids. However, it did not improve until adalimumab was started on. Case II: The second case is a 10 year-old boy who suffered from fever up to 38°C for almost 3 months. Up to the hospitalisation he had been diagnosed via telephone consultations. Due to suspected respiratory tract infection he was treated with antiviral drug and later with antibiotics without any improvement. Additionally aphthae, abdominal pain and lack of appetite appeared. He was admitted to a hospital where test results revealed anemia, elevated serum biomarkers of inflammation and faecal calprotectin level. Infectious causes of pyrexia were excluded. Endoscopic examination of the colon revealed macroscopic and microscopic features of Crohn’s disease. Finally, the patient was diagnosed with Crohn disease and treated with systemic steroids causing rapid improvement.

**Conclusions:** Crohn’s disease may initially manifest itself in children only by fever. Such a course of the disease, especially in the COVID-19 pandemic, may delay the diagnosis of the disease. The presented cases support the need to investigate the impact of the pandemic on the quality of pediatric diagnostics and treatment.

## Having a tiger by the tail - celiac disease and ulcerative colitis as comorbid diseases - the diagnostic challenge

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**Tutor:** Prof. Aneta Krogulska

**Introduction:** Celiac disease (CeD) and Inflammatory bowel disease (IBD), including ulcerative colitis (UC) and Crohn's disease (CD), are discovered to be immune - mediated enteropathies. To date, co-occurrence of CeD and IBD in pediatric patients is relatively rare and still hasn't been explored enough. Genetic association of IBD and CeD had been attributed. Furthermore, results of several studies indicate on the link between their coexistence and course of the disease. We report a case of a 17-year-old girl with CeD and UC.

**Case Report:** A 17-year-old female presented with one year history of recurrent abdominal pains, bloody diarrhea, recurring episodes of nausea, chronic vomiting, stools with a mucous (periodically with blood) and weight loss (7 kg/2 months). Due to these symptoms she was treated by a GP with antispasmodic drugs and PPIs; non-significant clinical improvement had been reported. As a result of increasing symptoms and abnormalities in laboratory tests (Hb 9.5g/dl, HCT 31.8%, CRP 17.55 mg/l ESR 28 mm/hour) she was admitted to the hospital. Stool examinations showed high levels of calprotectin (703 mg/dl) with negative stool cultures. The differential diagnosis was performed. Based on the history, clinical course of the disease, serological tests (anti-tissue transglutaminase antibodies tTG-IgA 255 CU, tTG-IgG 25.5 CU), endoscopy (edematous mucosa, erythema and mucosal friability in the colonoscopy; scalloped duodenal folds and granular appearance of the mucosa in the gastroscopy), histopathological (edematous mucosa, villous atrophy; Marsh type 3b) and magnetic resonance enterography (bowel wall thickening, diffusion restriction, enlarged mesenteric lymph nodes) the diagnosis of UC and CeD were established. Hence, the patient was started on a strict gluten free diet and treated with metronidazole, mesalamine and systemic steroids which were gradually tapered of over a period of 3 months. Symptoms improvement wasn't noted thus the current treatment was modified. The patient received an induction treatment of Infliximab. The therapy was discontinued after the third dose due to the lack of the response. Cyclosporine treatment was provided with gratifying results. The patient continues to remain under the follow-up treatment of cyclosporine and the importance of strict compliance to the dietary elimination has been advised.

**Conclusion:** Highly increased risk of CeD in individuals with IBD, when comparing with the general population, has been confirmed in adults and children. This comorbid may be the result of four shared risk loci: PTPN2, IL18RAP, TAGAP and PUS10. Both diseases can present with similar gastrointestinal symptoms what poses a diagnostic challenge. Proven association between CeD and IBD may result in the course of the disease, such as CeD may worsen symptoms of IBD or the treatment of IBD may mask the underlying CeD. In conclusion, co-occurrence of IBD and CeD should be considered during diagnosis and treatment in order to obtain better clinical results.

## **Ileoileal intussusception in 8 years old male caused by Burkitt lymphoma managed by a minimally invasive surgical approach – case report**

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**Tutor:** MD PhD Marek Wolski

**Introduction:** Intussusception is a common cause of abdominal pain in pediatric population, especially during first 2 years of age. In older children the incidence declines, but the possibility of existing pathological lead point, such as Meckel's diverticulum, polyp or lymphoma, increases. Burkitt lymphoma represents 40-50% of all Non-Hodgkin Lymphoma cases in childhood. It is aggressive, highly malignant and rapidly growing B-cell neoplasm, most of the time with the onset in the abdomen. Although intussusception caused by Burkitt lymphoma is rare, it may contribute to the faster detection of the malignant lesion, which in turn may translate into the possibility of using the least invasive surgical treatment options.

**Case report:** The 8-years old male was referred to pediatric surgery clinic with suspicion of ileocecal intussusception. He had suffered from abdominal pain with vomiting and diarrhea for 3 weeks before admission and at the day of admission was also apathetic and with malaise. The ultrasound examination showed characteristics of ileoileal intussusception. In the X-ray the features of subobstruction were described. In physical examination the abdomen was tender, painless and without pathological resistance. He was left in hospital for observation, where in the next ultrasound examinations the picture characteristic for intussusception persisted. After 6 days of hospitalization, as the ultrasound picture and the symptoms persisted, the suspicion of pathological lead point was raised and the patient was qualified for operation. After the incision of umbilical ring the wound retractor was placed in abdominal cavity. The retractor was tightly connected with a sterile glove, into which the trocars for laparoscopic instruments were put. After insufflation of the abdominal cavity the intussuscepted segment of the intestine was visualized, pulled up to the umbilicus and removed from the abdomen through the incision. After reducing the intussusception, the tumor of the intestine was revealed, resected and primary anastomosis was made. The postoperative period was uneventful. The resected segment of the intestine was submitted to histopathologic examination, which revealed Burkitt lymphoma in the specimen. The patient was consulted in the pediatric oncology department, where after evaluation was classified as stage I Burkitt lymphoma and the appropriate chemotherapeutic treatment was administered. After the treatment the patient was discharged home in good general condition.

**Conclusions:** Persisting intussusception, especially in older children, should always raise the suspicion of the pathological lead point and encourage an operational approach. This can lead to earlier diagnosis of lymphoma of the GI tract. Thanks to the diagnosis of the disease at its early stage, it is possible to use minimally invasive surgical techniques in the treatment, what gives the patients better chances for a faster recovery with less complications.

## Rare disease Labrune syndrome – radiological diagnosis.

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**Introduction:** Labrune syndrome also known as leukoencephalopathy with calcification and cysts (LCC) is a rare genetic syndrome with autosomal recessive inheritance, affecting fewer than one in 1 million people. After many years of diagnosis based on clinical, radiological, and histopathological findings, in 2016 there was a breakthrough, related to the confirmation of a mutation in the SNORD118 gene as the cause of this syndrome. In addition to typical radiological findings (such as diffuse cerebral microangiopathy with the development of micro - and macrocysts, extensive cerebral calcifications, demyelination and hemorrhage), patients may also complain of focal neurological deficits, extrapyramidal, pyramidal and cerebellar symptoms, headaches, seizures and cognitive deficits.

**Case Report:** We report a normally developing 10-year-old girl, who complained of chronic headaches and frequent upper respiratory tract infections without any additional clinical symptoms. The family history was negative. Pregnancy and the delivery period were unremarkable. In head CT bilateral, symmetrical and multifocal calcification in deep brain structures (basal ganglia) and dentate nuclei were found. Brain MRI showed small areas of hemorrhage with the areas of periventricular white matter leukodystrophy and cysts, which grew up in the next MRI. After that, the girl was qualified for whole-exome sequencing (WES), which showed mutations in the SNORD118 gene and confirmed the diagnosis. To the best of our knowledge, ours is probably the first case of a child reported in Poland. Our patient presented with raised intracranial pressure and cyst-related mass effects, which are the main presenting features of LCC. Etiopathogenesis of LCC is still a matter of debate.

**Conclusion:** Labrune syndrome is an extremely rare disease, which poses a huge diagnostic challenge. The discrepancy between clinical and radiological data was solved by cooperation between radiologists, clinicians and geneticists. Suspicion of LCC was confirmed in whole-exome sequencing.



## **Hemolytic disease of the fetus and newborn treated with multiple intrauterine transfusions**

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**Introduction:** Hemolytic disease of the fetus and newborn (HDFN) is a potentially life-threatening state, characterized by maternal synthesis of alloantibodies against fetal antigens. In the majority of cases, antibodies are directed against fetal antigens of Rh blood system. Antibodies cross the placental barrier and coat fetal red blood cells leading to its' destruction and subsequent hemolysis. As the result, fetus is endangered by hemolytic anemia, chronic hypoxia and severe damage to tissues and organs. At present, severe cases of HDFN are treated by intravascular (intrauterine) transfusion via the fetal vein.

**Case Report:** We present a case of 43-year old patient, who was under observation during 5th gestation to 3rd labor due to the risk of HDFN as a result of anti-D antibodies. At 18th week of the gestation due to elevated flow velocity in fetal middle cerebral artery (PSV MCA = 1,52 MoM), patient was qualified for intrauterine transfusion. Anti-D antibodies titer was determined significant. At the time of the transfusion, fetal hemoglobin (Hg) level was 8,4g/dl. 11.0 ml packed red blood cells was transfused and Hg level at the end of the procedure was found to have reached 14.8g/dl. Due to recurrent fetal anemia, further intrauterine transfusions were performed. Total of 11 packed red blood cells transfusions were necessary, and the average interval between procedures was 10.9 days, whereas the shortest interval was 7 days. Total of 429 ml packed red blood cells was transfused. Mean hemoglobin levels before procedures was 9.15g/dl (lowest Hg level=4.20g/dl). Mean hemoglobin level after procedures was 13.7g/dl. Last intrauterine transfusion was performed 13 days before labor. At 36. weeks of gestation cesarean section was performed due to the risk of neonatal asphyxia and previous cesarean delivery. A live, premature, 2930 g and 52 cm female neonate was born. Apgar score was 10-10-10.

**Conclusion:** Presented case report is an example of the utmost significance of early, fast and effective identification of maternal alloimmunization, especially in multiparous women and women with burdened obstetrics history. When HDFN is diagnosed, close supervision with repeated MCA-PSV assessment and sonographic imaging is indicated. Those measures allow to early diagnosis of fetal anemia and other serious complications associated with HDFN. Intrauterine blood transfusions are regarded as lifesaving procedures and can be repeated several times during gestation in case of recurrent fetal anemia.

## **The girl beyond the theory of probability - the late disclosure of spherocytosis.**

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**Introduction:** Congenital hemolytic spherocytic anemia is the most frequent type of hemolytic anemia which is caused by the defect in the protein structure of the erythrocyte's cell membrane. It arises from the mutation of genes which encode the determining cell shape complex proteins like actin and spectrin. Treatment is symptomatic.

**Case report:** Patient born in 2017, at the 40th week of pregnancy in average condition. Diagnosed with severe anemia of unclear etiology (PRBCs transfusion at 1st day of life). Serological conflict was eliminated. Patient was unsuccessfully treated with erythropoietin so it was decided to broaden anemia diagnostics. Frequent transfusions and nonstandard course led to pursuing gene analysis for most common anemia. Thalassemia, sickle cell anemia, spherocytosis, congenital dyserythropoietic anemia, DH G-6-P deficiency, Fanconi syndrome, enzymopathy and hemoglobinopathy were eliminated. Myelodysplastic syndrome (RC-MDS) was diagnosed. RC-MDS entails higher risk of acute myeloid leukemia (AML) transformation and may be an indication to hematopoietic stem cell transplantation. Over the following months, it was observed that plasma concentration of bilirubin, iron and ferritin were increasing, which led to secondary hemochromatosis diagnosis. Iron chelating treatment was implemented. In connection with intensification of hemolysis, a decision about broadening genetic diagnostics towards congenital anemia, was made. In 2020 Next Generation Sequencing (NGS) was performed and homozygous modification of unclear pathogenicity in the gene SPTA1 causing substitution of valine for methionine in position 2114 at alpha-spectrin, was detected. This protein is part of determining cell shape complex. Lack of this mutation descriptions explains delay in diagnosis of very rare spherocytosis type 3.

**Conclusions:** Children's congenital anemia is a multifactorial medical condition and requires broad diagnostic spectrum. Apart from similar clinical process of the disease in individual types of congenital anemia, the prognosis can be fundamentally different. Uncharacteristic evolution and modern, progressive genetic diagnostic procedures makes physicians think unconventionally and may bring surprising results.

## A rare case of a child with Kasabach-Merritt syndrome

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**Introduction:** Kasabach-Merritt syndrome (KMS) is a rare but life-threatening thrombocytopenia and consumptive coagulopathy, which occurs exclusively as a complication of the vascular tumors kaposiform hemangioendothelioma (KHE) and tufted angioma (TA). KHE and TA are rare, benign vascular tumors, with an incidence of 0,07 per 100000 and they typically present in early infancy. KHE and TA are classified as locally aggressive vascular tumors, of intermediate malignant potential as they are locally aggressive but are not known to metastasize.

**Case report:** A 4-month-old girl was admitted to the hospital in February 2021 due to thrombocytopenia and an enlarging, purpuric lesion of the right breast skin for a month. Physical examination showed a tender, firm, purpuric lesion 12 centimeters in diameter of the right breast skin. Laboratory tests revealed thrombocytopenia ( $51 \times 10^3/\text{mm}^3$ ), elevated D-dimer level ( $>10000 \text{ ng/ml}$ ) and INR. USG, MRI showed an extensive, irregular, poorly separating vascular tumor in the soft tissues of the right chest wall  $99 \times 68 \times 43 \text{ mm}$ , penetrating thorax and thickening involving the parietal pleura. Based on the physical examination and diagnostic additional tests, Kasabach-Merritt syndrome was suspected. Due to the impossibility of radical surgery, pharmacological treatment was started: propranolol, prednisone, and then sirolimus.

**Conclusion:** Although Kasabach-Merritt syndrome is a rare disease should be always included in the differential diagnosis in children with unexplained thrombocytopenia and coagulation disorders. Once the diagnosis is made, the treatment is largely supportive and includes prevention of life-threatening complications like hemorrhage while addressing the underlying tumor.

## Cardiac arrhythmias as a cause of tachycardia - induced cardiomyopathy

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**Tutor:** Prof. Artur Bossowski, MD PhD Jerzy Wójtowicz

**Introduction:** Tachycardia - induced cardiomyopathy (TIC) is a rare, reversible form of dilated cardiomyopathy (DCM). It is defined as systolic and/or diastolic atrial or ventricular dysfunction that can lead to heart failure. It is caused by excessively fast atrial or ventricular rhythms in the absence of pre-existing structural heart disease. TIC usually develops gradually - over months or years, but can also occur after a very short duration of tachyarrhythmia.

**Case Report:** A 10-year-old female patient after percutaneous closure of secundum atrial septal defect (ASD II) with the Amplatzer Septal Occluder at the age of 4 years, with a history of Hashimoto's disease and multiple attacks of supraventricular tachycardia since the procedure, treated with various combinations of antiarrhythmic drugs, was admitted to the ICU after sudden cardiac arrest with successful resuscitation, which occurred after swimming in the water. In the ambulance, ventricular tachycardia was diagnosed. One month later, after another episode of tachycardia, the patient was scheduled for ECG tele-monitoring. Family history of DCM (father - DCM, father's brother - death after heart transplantation, aged 23, father's mother - complex arrhythmia, DCM). In spite of this, the genetic test excluded with high probability the involvement of genetic factors in the etiology of the disease. Two months later, after the second EPS, which failed to differentiate the ventricular tachycardia, the decision of implantation an endocavitary cardioverter-defibrillator system was made. A left-sided sympathectomy (Th2-Th5) was also performed. At the age of 12 years, TIC was diagnosed due to left ventricular dysfunction. During a subsequent EPS examination, left atrial fibrillation was recorded. The cardioversion performed did not stop the seizure. Currently, the patient is under constant cardiological care and wait for the outcome of a foreign consultation.

**Conclusions:** Pediatric cardiomyopathies, although not common, are a significant cause of morbidity and mortality in affected children. Recognition of the causal relationship between cardiac arrhythmias and progressive myocardial dysfunction is essential for appropriate treatment. This case highlights the importance of careful and individualised pharmacological and surgical therapy for each patient.

## **Cardiac fibroma presenting as ventricular tachycardia- a case of 5-year-old patient with Gorlin-Goltz syndrome**

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**Tutor:** MD Ewa Płodzień

**Introduction:** Primary cardiac tumours in paediatric population are rare and mainly benign. Cardiac fibroma is the second most common primary heart tumour after rhabdomyoma in children. Cardiac tumours affecting children are often associated with genetic disorders, for example about 3% of patients with Gorlin- Goltz syndrome have a cardiac fibroma. Cardiac fibroma may be associated with ventricular arrhythmia, as presented in our case of 5-year-old boy.

**Case report:** From birth, a patient had a noticeable dysmorphic features and then the developmental delay was observed. In the fifth year of life he was hospitalised for several episodes of ventricular tachycardia. The heart rate of one of them reached 270 bpm. The patient also had a polymorphic ventricular arrhythmia throughout the observation period. The episodes of ventricular tachycardia were unresponsive to pharmacological treatment. Tachycardias subsided only after electrical cardioversions. Despite treatment escalation, the polymorphic ventricular arrhythmia could not be reduced. Echocardiography revealed an arrhythmogenic tumour, located in the left ventricle. The patient was operated on and a partial resection of the tumour was performed. After excision of the tumour, ventricular tachycardia subsided and a polymorphic ventricular arrhythmia was significantly diminished. Histopathological examination confirmed the diagnosis of cardiac fibroma. Some of patient's abnormalities like syndactyly correlated with the diagnosis of cardiac fibroma and with his mother's oncological history gave rise to the suspicion of Gorlin- Goltz syndrome. Genetic tests confirmed this diagnosis.

**Conclusion:** Cardiac tumours are not common in paediatric population but their clinical consequences may be severe. Dysmorphic features correlated with a heart defect are an indication for genetic counselling.

## **Case study in pediatric cardiology: treatment of pulmonary arteriovenous malformation using Amplatzer vascular plug.**

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**Tutor:** MD Ewa Płodzień

**Introduction:** Arteriovenous malformations are characterized by the presence of altered arterial and venous vessels that connect directly to each other, bypassing the capillary network. Pulmonary arteriovenous malformation (PAVM) is a rare (around 2-3 per 100,000) cardiovascular anomaly. Most cases are congenital, frequently related to hereditary haemorrhagic telangiectasia (HHT). PAVMs are rare vascular anomalies of the lung, in which abnormally dilated vessels provide a right-to-left shunt between the pulmonary artery and vein.

**Case report:** A 1-day-old newborn, prenatally diagnosed with pulmonary arteriovenous malformation in his right lung was referred to the cardiology department in The Children's Memorial Health Institute. On admission patient was in severe but stable condition. Clinical examination showed central cyanosis. Oxygen saturation level varied between 60% and 70%. On the same day right and left heart cardiac catheterization was performed. Infant underwent transcatheter embolization with Amplatzer vascular plug (AVP). During this procedure the AVP has been used for occlusion of arteriovenous fistula in the right lung. The AVP attached to the delivery wire was advanced through the long sheath, the distal disk was opened in the feeding artery, the sheath retracted allowing opening of the proximal disk, and the device was released. The postprocedural recovery was uncomplicated. After the procedure saturation levels increased to 93-100%. The patient was asymptomatic on follow up.

**Conclusions:** Surgical resection of PAVM has now been largely replaced by transcatheter device closure. A variety of devices like detachable occlusion balloon, coil embolisation and Amplatzer vascular plugs are used for embolotherapy of large pulmonary AVMs. This case shows that large pulmonary AVM can be successfully treated with Amplatzer vascular plug.

## **Displaced implant in a 5-month old girl with an aortopulmonary window – case report**

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**Tutor:** MD Ewa Płodzień

**Introduction:** Aortopulmonary window (APW) is a rare heart defect consisting of an additional communication between the ascending aorta and pulmonary trunk above the two separate semilunar valves. The disease results in an increased pulmonary blood flow that leads to congestive heart failure, pulmonary hypertension and poor survival if untreated.

**Case report:** Herein we present the case of a 5-month old girl who was admitted to our clinic in poor general condition with a history of cardiogenic shock, urinary tract infection and multi-organ failure. An echocardiography test was conducted confirming the presence of an aortopulmonary window, as well as revealing severe pulmonary hypertension and impaired contractility of the left ventricle. In order to mitigate the deterioration of patient's health, a life-saving surgical correction was performed. Due to poor condition, a typical open surgery was deemed not possible and thus a transvenous closure with the patch was decided upon. Unfortunately a follow-up echocardiography two weeks later revealed that the implant shifted to the bifurcation of the pulmonary trunk, no longer fulfilling its purpose. Patient was qualified for percutaneous removal of the displaced patch and placement of a larger implant. After the intervention, patient's condition improved and series of follow-ups confirmed successful occlusion of the aortopulmonary window. The girl was discharged home in good condition.

**Conclusions:** Heart defects may cause many serious, life-threatening conditions among infants. If there are no contraindications, aortopulmonary window should be managed through an open surgical correction as the transvenous intervention is more predisposed to complication. Even after successful correction cardiac patches are susceptible to malfunction, thus patients with history of surgical interventions should be regularly checked for implant placement.

## Hematopoietic stem cell transplant in patient with Hunter syndrome - case report

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**Tutor:** MD PhD Katarzyna Drabko

**Introduction:** Mucopolysaccharidosis type II (MPS II, Hunter syndrome) represents a group of rare genetic metabolic diseases and is caused by mutation in idursulfase (IDS) encoding gene. It is an inherited mucopolysaccharidosis and its prevalence ranges from 0,03-0,71 per 100,000 live births. Most common symptoms of MPS II, such as unusual facial features, skeletal abnormalities or joint stiffness are caused by accumulation of glycosaminoglycans (GAGs) in tissues and can be already observed in early childhood. Among the methods of MPS II treatment, additionally to supportive care, patients may receive enzyme replacement therapy (ERT) or hematopoietic stem cell transplantation (HSCT), which is the only potential way to deliver enzyme to CNS.

**Case report:** A 15-month-old boy, 3 months post otitis media infection, had been suspected of suffering from storage disease during control medical appointment, related to three day fever. The first presented symptoms were: coarse facial appearance and recurring infections. The diagnosis of Hunter syndrome has been confirmed by genetic test. Based on the patient's clinical status, decision about HSCT was made and soon after that, the boy was qualified for the procedure. When the patient turned 19 months the transplant was performed without significant toxicity. Patient achieved complete donor chimerism and early treatment effects, such as increased mobility in limbs' joints and softening of facial features counted as first noticed positive outcomes.

**Conclusion:** Nowadays HSCT is an effective alternative to ERT in treatment of Hunter syndrome. Improvement in HSCT procedure related to better donor choice, supportive care and prophylaxis of post transplant complication lead to reduction of toxicity of this type of treatment.



## **Non-Facing Sinus ALCAPA Associated with Left Sided Cardiomegaly Repaired Successfully with Takeuchi Technique: A Case Report**

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**Tutor:** MD Vishal Bhende, MD Hardil Majmudar

**Introduction:** Anomalous left coronary artery from pulmonary artery (ALCAPA) is a rare congenital heart disease that may present isolated or may be associated with other cardiac malformations. Most of the patients develop symptoms during infancy but some may remain asymptomatic up to adulthood. Symptoms range from mild distress to severe irritability and feed intolerance.

**Case Report:** We report a case of a 5-month-old male child who presented with congestive heart failure and was diagnosed as a case of ALCAPA with left atrial and left ventricular dilation based on 2D echocardiography and computed tomography (CT) coronary angiogram. Left Main Coronary Artery was shown to be arising from the posteroinferior wall of Main Pulmonary Artery (MPA). Various surgical approaches have been suggested in the repair but the Takeuchi technique was preferred owing to its origin from the non-facing sinus of the pulmonary artery and co-existing dilatation of left atria and ventricle. The surgery was uneventful and there were no postoperative complications. A cardiac CT dynamic study was also done on the follow-up visit 5 months later and no signs of abnormality or complications were reported.

**Conclusion:** The diagnosis of ALCAPA in infants and its early surgical management is crucial in preventing further complications and in improving the survival chances of the baby. Diagnosis of ALCAPA is difficult and a high clinical suspicion along with proper investigations can aid in its early diagnosis. An early intervention is necessary to prevent irreversible cardiac complications and early mortality

## **Therapeutic challenge - a teenager with a history of recurrent cerebrovascular events with comorbid heart defect and thrombophilia.**

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**Presenting author:** Michał Stankiewicz

**Tutor:** MD Sara Korabiewska-Pluta, MD PhD Krzysztof Michalak

**Introduction:** The patent foramen ovale (PFO) represents a remnant of the fetal circulation found in almost a quarter of adults. Ischemic stroke may often provide the first suggestion for this cardiac defect, as PFO is found in up to 61% of patients under 55 years of age with a history of cerebrovascular events. Furthermore, the presence of patent foramen ovale increases the risk of recurrent stroke threefold. The comorbidity of PFO and congenital thrombophilia may promote paradoxical embolisms to cerebral vessels even in pediatric patients.

**Case report:** A 12-year-old patient with congenital heart defect - patent foramen ovale and mitral valve insufficiency was admitted to the Cardiology Department of Polish Mother's Memorial Hospital Research Institute for complex cardiovascular evaluation and therapeutic options assessment. The patient has a history of bilateral deep cerebral structures stroke and right hemisphere ischemic stroke approached with mechanical thrombectomy, splenic infarction, factor V Leiden mutation and protein S deficiency. On admission the patient was in good general condition. On physical examination, a 3/6 Levine's systolic murmur at Erb's point and bilateral hemiparesis were present. During hospitalization there was an echocardiography performed with the following findings present: PFO with right-left intracardiac shunt, left atrial enlargement, moderate mitral regurgitation with marginal perforation of the posterior mitral cusp and excessive myocardial trabeculations of the left ventricle suggesting left ventricular noncompaction. The cardiosurgical consultation qualified the patient for mitral valve surgery with PFO closure and left atrial appendage clipping. During hospitalization, CT-angiography of the cerebral vessels was performed. complicated by an episode of gibberish speech with symptoms of facial nerve paralysis, nausea and general weakness. The symptoms resolved spontaneously. However, both this incident and very high risk of thromboembolic complications disqualified the patient from surgical treatment. Instead, transcatheter closure of the patent foramen ovale was performed. Follow-up echocardiography confirmed stability of the Occluder and revealed no leaks. Pharmacotherapy was modified by implementing Warfrin under INR control and discontinuing Clexane. Also, the patient was started on ASA and clopidogrel was prescribed for one month following the cardiac catheterization procedure.

**Conclusion:** A key factor contributing to ischemic stroke in such a young patient is thrombophilia coexisting with PFO and myocardial abnormalities of the left ventricle. Percutaneous closure of the atrial septal defect aims to reduce the occurrence of such incidents in the future. The presence of thrombophilia also limits therapeutic options for the concomitant mitral valve defect due to the high risk of intra- and postsurgical complications.

## Three-stage treatment of congenital heart disease: the Norwood, Glenn and Fontan procedures

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**Tutor:** MD PhD Ewa Płodzień

**Introduction:** The double inlet left ventricle is a rare congenital disease that involves chambers and valves of the heart. The heart of patients with this condition develops only the left ventricle to which both atria are connected. Additionally, other cardiac defects may be presented.

**Case report:** The patient is a three-year-old boy with a complex congenital heart disease. He was diagnosed prenatally with a double inlet left ventricle (DILV), transposition of the great arteries (TGA), hypoplastic aortic arch (HAA), and small atrial septal defect (ASD). He was born from the first gestation in 41 Hbd by cesarean section in February 2017. After two weeks, the Norwood procedure was performed with modified Blalock-Taussig shunt (B-T shunt), interatrial sept excision, closure of patent ductus arteriosus, angioplasty that connect the aortic arch and pulmonary trunk. Later, due to narrowing of the B-T shunt, a stent was placed inside percutaneously. In September 2017, the patient was readmitted due to high fatigability. Balloon angioplasty of the aortic arch was performed twice, and finally, in January 2018, a stent was placed there due to re-coarctation. In February 2018, the Glenn procedure was performed and the B-T shunt was closed. The third stage of the surgical treatment, the Fontan procedure, was scheduled for June 2020, but due to the SARS-COV-2 pandemic, it was postponed.

**Conclusion:** Prenatal diagnosis of this rare condition is crucial for survival of infants because it allows the doctors to prepare adequate treatment. Only an early operation performed by qualified surgeons with the support of an interdisciplinary team of physicians can give the patient a chance of survival.

## "What will leave after Duncan?" - pediatric immunodeficiency syndrome with Xq25 duplication.

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**Tutor:** MD Tomasz Ociepa

**Introduction:** Duncan's syndrome (X-linked lymphoproliferative syndrome, XLPD) is a rare genetic disease resulting from a defect in the SH2D1A gene located on the Xq25 chromosome and encoding the SLAM protein responsible for the functional maturity of helper and cytotoxic lymphocytes. It leads to immunity disorders and increases the risk of developing certain cancers, especially in response to EBV infection. One of the elements of treatment is hematopoietic cell transplantation. Xq25 Duplication Syndrome is a rare, heterogeneous disorder characterized by many congenital defects, mainly in the nervous system. Xq25 duplication syndrome leads to moderate mental retardation, is responsible for speech disorders and behavioral problems. Sometimes it is associated with skeletal system defects, convulsions, autism spectrum disorders, and sleep disorders. Treatment is limited to symptomatic treatment

**Case report:** An 8-year-old patient with previously diagnosed celiac disease, Asperger's syndrome, gastroesophageal reflux disease, cerebral vascular malformations and visual impairment was referred by the Genetic Clinic to the Hematology Clinic with suspected XLPD syndrome. In the genetic test using the oligonucleotide microarray method, a triplication mutation of the chromosome fragment containing the SH2D1A and TENM1 genes was recognized. The XLPD syndrome leads to immunodeficiency, so the patient was enrolled in an immunoglobulin substitution program to reduce the risk of infections. Due to the unclear result of the genetic test and the clinical course of the disease, it was decided to verify the diagnosis. As a result of the study carried out using the Next Generation Sequencing (NGS) method, a duplication of a fragment of the long arm of the X chromosome, including the SH2D1A and TENM1 gene, was found. The results of the examination and the course of the disease made it possible to exclude Duncan's syndrome and stop the preparations for hematopoietic cell transplantation. An extremely rare disease was diagnosed - Xq25 duplication syndrome. So far, 36 cases of duplication and one case of triplication have been described. The observations have not shown an increased risk of haematological diseases and neoplasms. After the diagnosis was verified, the administration of immunoglobulins was abandoned. The patient is not under increased oncological supervision, but due to his health conditions, he still requires periodic checks in specialist clinics.

**Conclusions:** Genetic tests, despite their high accuracy, should always be confronted with the patient's clinical picture. In case of diagnostic doubts, especially when the disease picture does not correspond to the test results, they must be verified or repeated based on methods characterized by greater sensitivity.

## **Wheezing and oedema: are allergies always the culprit?**

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Lithuanian University of Health Sciences

**Presenting author:** Andrius Daugėla

**Tutor:** Prof. Lina Jankauskaitė

**Introduction:** T-lymphoblastic lymphoma is a common cancerous disease that mainly affects children of ages from 2 to 5 years old. It is an acute condition that progresses rapidly and is typically fatal within weeks or months if left untreated. Signs and symptoms can be nonspecific and misleading which is why a thorough examination is needed.

**Case report:** A 3 year old boy presented with difficulty in breathing and oedemas that lasted for 2 weeks. Patient was suspected allergies and treated for laryngitis as an outpatient. However, the condition only worsened. With progressing oedema and wheezing he arrived to paediatric emergency room. On physical examination: SpO<sub>2</sub> 94%, no cyanosis, but oedema mostly pronounced in the upper body parts. Clear signs of RDS - thoracic retractions and nasal flaring. Lung auscultation - clear obstruction, prolonged exhalation, basal crepitation. No abnormalities in blood test. The initial treatment was started with dexamethasone and salbutamol. However, without any progress. Thus, chest X-Ray was performed: an enlarged mediastinum, atelectasis, bilateral pleuritis were observed. Urgent Chest-CT followed: right pleural cavity presented with hydrothorax with about 1.7 cm of fluid, enlarged mediastinum and dislocated trachea with signs of tracheal and bronchial compression. He was admitted to the paediatric oncology department for further investigations and treatment. Cytoreductive treatment consisting of methylprednisolone, allopurinol and famotidine had a positive impact on the reduction of the mediastinum mass. Oedemas, shortness of breath, cough were relieved because of the following treatment. As a following diagnostic measure thymus biopsy was planned. Additional Chest-CT with contrast was performed and pulmonary embolism was detected thus the thymus biopsy had to be postponed and was treated with fraxiparine. Finally, biopsy concluded a T-cell lymphoblastic lymphoma and trepanobiopsy confirmed this diagnosis. Patient was transported to a centre of haematological malignancies for children.

**Conclusion:** A case of a T-cell lymphoblastic lymphoma mainly associated with respiratory distress symptoms is presented. A mass in mediastinum can be the cause of upper respiratory tract obstruction. Poor evaluation of this condition can be the cause of cancer growth and spread. It is highly susceptible to drug therapy but if not assessed thoroughly it can be fatal.

## **CASE STUDY: PAEDIATRICS 2**

**COORDINATORS: MICHALINA JURKIEWICZ ANNA LUBNAUER**

### **Jury:**

Prof. Beata Mianowska

MD PhD Małgorzata Stańczyk

Prof. Joanna Jerzyńska

## 4-week-old infant with a prenatally diagnosed unilateral hydronephrosis - case report

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University of Rzeszów

**Presenting author:** Filip Kamiński

**Tutor:** MD PhD Grażyna Chmaj

**Introduction:** Hydronephrosis refers to dilation of the renal pelvis and calyces caused by the accumulation of urine as a result of outflow obstruction and involves atrophy of the kidney structure. Prenatal ultrasonography may reveal a fetus with dilated kidneys, which occurs in 1 per 100 pregnancies. Hydronephrosis is the most common urologic abnormality identified during prenatal ultrasonography in the second and third trimesters - it represents 50% of all urological abnormalities found in antenatal USG. Prenatal unilateral hydronephrosis should undergo a semi-urgent postnatal evaluation, within 1-3 weeks.

**Case report:** A 4-week-old male newborn was admitted to the Department of Pediatric Surgery due to left-sided hydronephrosis. The preoperative ultrasonographical examination revealed a significantly enlarged left kidney, which measured 97 x 49 x 34mm. The left kidney's volume was more than three and a half times that of the right kidney's (right kidney: 21,5ml vs. left kidney: 80,8ml). The pelvicalyceal system was vastly extended, the renal pelvis was dilated up to 48mm (APD), whereas the renal parenchyma was narrowed to 2,5mm. Hypofunction of the left kidney was also detected by conducting the renal scintigraphy, which showed only 28% share in infiltrating. The obstruction of the ureteropelvic junction was the cause of hydronephrosis. Resection of the pelviureteral segment was performed with ureteroplasty according to the Anderson-Hynes procedure with a satisfactory result.

**Conclusion:** Ultrasonography is of fundamental importance to pediatric urology. Hydronephrosis is the most frequently discovered fetal urologic irregularity, but its severity and clinical consequences can differ greatly. The treatment depends on the extent of enlargement of the pelvicalyceal system. Surgical operation is essential. Ureteroplasty, according to Anderson-Hynes procedure, is one that can be chosen to treat this condition. A decision about the way of treatment is crucial and it should be conducted to each patient individually

## **A misleading initial success of conservative therapy in the management of necrotizing enterocolitis (NEC)**

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Medical University of Warsaw

**Presenting author:** Mateusz Wawrzeńczyk

**Tutor:** MD Marek Wolski

**Introduction:** Necrotizing enterocolitis (NEC) is the most common gastrointestinal medical emergency occurring in neonates. In patients who do not respond adequately to medical treatment surgical intervention may occur with either use of a peritoneal drain or laparotomy. However, a case presented below shows that even achieving a very good response to medical therapy doesn't guarantee a successful NEC management.

**Case report:** A male infant was born naturally at 30 weeks of gestational age with Apgar score 7-8 and a birth weight of 1635g. The patient was transferred to NICU with respiratory support. An empiric therapy with ampicillin and gentamicin was started. He received enteral nutrition since 20th hour of life - initially with good tolerance, but on 3rd day of life it was suspended, because of greenish residuals and abdominal distention. On 5th day of life surgical consultation gave no reason for urgent surgery despite 2 days long constipation. Then USG showed pneumatosis intestinalis. Due to all mentioned alarming signs, therapy with Tazocin was initiated. However, two days later patient presented with tachycardia, tachypnoe and body temperature of 37,5°C, so vancomycin was administered as well. All that time CRP and procalcitonin were at normal levels. Conservative therapy appeared successful and on 14th day of life patient was referred to Neonate Pathology Department in fair condition. In NPD he had significantly improved so respiratory support was withdrawn after a few days and enteral nutrition was implemented achieving good tolerance of gradually increased portions. Unfortunately, after 12 days of stay in the department patient suddenly showed signs of secondary infection, elevated inflammatory markers and anemia. The infant was transferred to NICU in serious condition, where he was sedated, intubated and received respiratory support. Radiological examinations didn't exclude pneumatosis intestinalis. Conservative therapy was undertaken once again but due to a lack of response, bowel resection with ileostomy creation was finally performed. Surgery combined with antibiotherapy eventually led to patient's recovery.

**Conclusions:** This case illustrates that NEC could be a recurrent disease in which a success of conservative therapy may be in fact misleading as the patient condition can deteriorate after a period of improvement. Therefore a pediatrician should always stay cautious during the management of NEC as an extremely fragile intestine of a preterm is potentially susceptible to relapse.



## **A patient with coexistent central precocious puberty and adrenal hyperplasia due to 21-hydroxylase deficiency**

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**Presenting author:** Anna Muszyńska

**Tutor:** MD PhD Beata Sawicka, Prof. Artur Bossowski

**Introduction:** Congenital adrenal hyperplasia due to 21-hydroxylase deficiency is one of the most common autosomal recessive disorders. The absence or deficiency of this enzyme leads to excessive adrenal androgen secretion and inhibition of cortisol synthesis. Precocious puberty means an abnormally early onset of puberty (before age 8 in girls and before age 9 in boys). It may be central (when the cause can be traced to the pituitary gland or hypothalamus) or peripheral (when it is caused by sex hormones from other improper sources).

**Case Report:** A 4,5- year- old girl was admitted to the hospital to diagnose the cause of precocious puberty. An acceleration in the rate of growth has been observed in recent months. Moreover, the appearance of pubic hair has been observed for 1,5 years. From about 2 months, a change from deciduous to adult teeth has been noted. On physical examination, high height (above 97th percentile), high weight, acne lesions, advanced puberty and significantly clitoromegaly were noticed. Bone age was estimated at 11 years. In laboratory tests - there was elevated androgens levels. The LH-RH stimulation test showed a prepubertal response. The tumors of ovaries and adrenals were excluded. Steroid profile in 24-hour urine collection confirmed simple virilizing form of non-classic congenital adrenal hyperplasia with 21-hydroxylase deficiency. It was finally decided to treat the patient with hydrocortisone orally in appropriate doses. During first three years of the therapy inhibition of androgen secretion was noticed, slowing down of the rate of growth and reduce puberty progression. When the girl was 7 years, she developed an enlargement of her breast and acceleration of her growth. Her bone age was 12 years. A GnRH stimulation test was performed to distinguish between GnRH-dependent (central) and GnRH-independent precocious puberty. Due to central puberty the girl was qualified for treatment with an GnRH analogue intramuscularly every 28 days. A tumor of brain was excluded. Treatment with hydrocortisone did not bring the expected results, so it was decided to include non-standard treatment with dexamethasone. Finally, treatment with triptorelin and dexamethasone resulted in inhibition of gonadotropin and androgen secretion.

**Conclusions:** 1. This case shows that more than one cause of precocious puberty can occur in a single patient. 2. Therefore, it is important to make a precise diagnosis in such a case and consider the different causes of this disorder. 3. In addition, the presented patient's results confirm that when hydrocortisone treatment fails, dexamethasone therapy brings positive results and improvement in the patient's clinical condition.

## Complex treatment of vascular malformation in 2 years old boy with Proteus Syndrome

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**Presenting author:** Adam Dobek

**Tutor:** Prof. Przemysław Przewratil

**Introduction:** Proteus Syndrome (PS) is a result of de novo punctual mutation in AKT1 gene. Most characteristic symptoms of PS are: progressive overgrowth of skeleton, skin, fatty tissue and central nervous system. Overgrowth half of the body is pathognomic. In addition, vascular malformations may occur.

**Case Report:** 2 year old boy was admitted to Department of Pediatric Surgery and Oncology of Medical University of Łódź because of massive overgrowth of limbs, lymphatic malformation of neck and ulceration of right axilla. The patient underwent sclerotization of malformation with Picibanil (OK-432) in another hospital, then was directed to our department for alternative therapy of malformation with sirolimus due to disappointing effects of previous treatment. Massive disturbance of cellular immunity was discovered and patient was disqualified for sirolimus treatment and required further immunological diagnostics. Waiting for results surgical excision of neck malformation was performed due to limitation of neck mobility. During operation transverse incision was made, huge multi-cystic lymphatic malformation was prepared. Lesion infiltrated all anatomical structures of neck and was penetrating superior thoracic aperture in subclavicular region. Lesion has been drained from serous-bloody substance and excised in 90% without complications. Bacteriological testing from ulceration in axillary tumor indicated *Pseudomonas aeruginosa* and antibiotics were administered. Second bacteriological testing indicated presence of *Enterococcus faecalis*. Central access was inserted, antibiotic therapy was changed and blood was transfused. Acute phase and infectious parameters improved and patient was discharged from hospital after 25 days. Currently experimental treatment with sirolimus ointment is being continued.

**Conclusion:** Treatment of vascular malformations is individual always. Possible methods include sclerotization, laser therapy or surgical treatment. Therapy should be the most comfortable and uncomplicated for the patient. However sometimes minimally invasive procedures don't achieve satisfactory results and classical surgery is the best option. This case is a good example of this method.

## CONGENITAL SENSITIVITY TO VITAMIN D - WHEN EVEN LITTLE IS TOO MUCH: A CASE REPORT

Justina Jankauskaite

Vilnius University Faculty of Medicine

**Presenting author:** Justina Jankauskaite

**Tutor:** MD PhD Karolis Azukaitis

**Introduction:** Hypercalcemia in infants and small children is relatively infrequent but may have severe short- and long-term consequences. Calcium disorders are primarily linked to parathyroid dysfunction. However, more rare causes include exogenous and endogenous hypervitaminosis D and a variety of other congenital conditions. In children, congenital causes of hypercalcemia are much more frequent than in adults. Among those, mutations in CYP24A1 gene, encoding 24-hydroxylase, result in impaired vitamin D metabolism, endogenous hypervitaminosis D and cause idiopathic infantile hypercalcemia. In such children, even prophylactic vitamin D supplementation in infancy can cause severe vitamin D toxicity and also lead to long-term kidney sequelae, including development of chronic kidney disease and urolithiasis.

**Case report:** A 4-month old boy presented to the hospital due to failure to thrive, hypotonia and progressive drowsiness. The patient was receiving 400IU of vitamin D which was stopped two weeks prior to admission as hypervitaminosis D (300 nmol/L) was diagnosed in the outpatient setting, but no clinical improvement was observed after vitamin D cessation. In the hospital, laboratory results revealed toxic vitamin D levels (722 nmol/L), severe hypercalcemia (total calcium above measuring range), hypercalciuria and compensatory parathormone suppression. Kidney ultrasound revealed medullary nephrocalcinosis but kidney function was preserved. Vitamin D intake was restricted and the patient was prescribed intravenous overhydration with normal saline, prednisolone 1 mg/kg for 10 days, and continuous potassium citrate supplementation. Vitamin D levels normalized following the treatment and the infant was showing normal growth with persistent mild hypercalciuria, nephrocalcinosis and normal kidney function while on continuous potassium citrate supplementation. Subsequent genetic testing with next generation sequencing revealed combined heterozygous pathogenic variants in the CYP24A1, leading to the diagnosis of idiopathic infantile hypercalcemia type 1.

**Conclusion.** Although idiopathic infantile hypercalcemia is a rare condition, it should be suspected in infants presenting with unexplained hypervitaminosis D, particularly with classical signs, such as failure to thrive and nephrocalcinosis.

## **Fetal cardiac rhabdomyoma and postnatal diagnosis in the direction of tuberous sclerosis (TSC).**

Joanna Kućmierz

**Presenting author:** Joanna Kućmierz

**Tutor:** Prof. Maria Respondek-Liberska

**Introduction:** Rhabdomyoma is the most common fetal cardiac tumor, accounting for 60-89% of primary fetal cardiac tumors. They commonly regress spontaneously during two first years of postnatal life. Large tumors can cause hemodynamic obstruction, heart failure, arrhythmias or fetal hydrops. In such situations pharmacologic or surgical treatment could be needed. Development of rhabdomyoma is related to tuberous sclerosis (TSC) – genetic disorder that causes non-cancerous tumors of heart, kidneys, lungs, liver, brain and skin lesions.

**Case Report:** A 42-year-old woman with diagnosed before pregnancy Hashimoto's disease and psoriatic arthritis and gestational diabetes, was referred to the Department of Prenatal Cardiology with the aim of precise examination of fetus because of many of cardiac tumors which were found in 22 hbd of pregnancy. In 26 hbd, fetal echocardiography revealed multiple cardiac rhabdomyomas in the wall of the right ventricle, in the intraventricular septum and in the posterior wall of the left atrium. Neurosonography demonstrated three cerebral tubers in temporal lobe of right hemisphere of the brain. In 29 hbd the size of the heart tumors increased and the systolic function of both ventricles deteriorated. In 33 hbd VSD and single additional contractions were visualized. Due to the systematic increase in the mass of tumors that narrowed the lumen of the mitral valve off label sirolimus therapy was offered to the pregnant woman, which was approved by the Fetal Team and the Bioethics Committee of the ICZMP. After presenting the pregnant woman such a possibility, the therapy was ultimately not applied due to an unambiguous refusal. In 35 hbd, there was a spontaneous premature birth. Newborn boy, with a weight of 2600 grams, received 9/9 points on the Apgar score. During the hospital observation, the boy was in a good general condition, with good respiratory and circulatory efficiency, with no heart murmur, normal heart tones, normal heart rhythm and normal ECG. There were paroxysmal changes in the EEG. Since the 6th day of postnatal life, the treatment with vigabatrin was started. Imaging examinations revealed cardiac tumors, cystic areas of the left kidney and subependymal tumors in the brain. A genetic test in direction of TSC is currently under development.

**Conclusion:** Due to the deteriorating condition of the fetus in subsequent studies, sirolimus therapy was proposed to the pregnant woman. There are several cases of successful prenatal therapy of cardiac rhabdomyoma in the literature which have led to a significant regression of tumor size. The first publication came out in 2018. It is worth emphasizing that this is a promising method that can be used in cases when the prognosis are particularly unfavorable

## **Ketogenic diet in treatment of intractable epilepsy – case report of 3-year-old girl with GABRB2 mutation**

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**Presenting author:** Michał Hutny

**Tutor:** MD PhD Justyna Paprocka

**Introduction:** Epilepsy is the most common neurological disorder in paediatric population. According to ILAE criteria, epilepsy can be diagnosed as intractable, when a sustained seizure freedom is not achieved, despite the two adequate trials of well-tolerated, appropriately chosen and used antiepileptic drug schedules. In these cases, non-pharmacological treatment such as ketogenic diet might be applied, with surprisingly good results.

**Case Report:** Presented patient was admitted to Paediatric Neurology Ward for the first time in November 2018, after the first epileptic seizure, presenting with abruptly impaired awareness, hypotonia and perioral cyanosis. A non-pathological brain morphology was observed in magnetic resonance imaging (MRI), whereas electroencephalography (EEG) showed abnormal activity with numerous generalized seizures. Etiology of disease was not clear at the beginning – in course of diagnosing an Andermann syndrome, mutations in 49 genes of NGS epileptic panel and the most common lysosomal enzymopathies were ruled out. Eventually, whole-exome sequencing (WES) performed in August 2019 in Warsaw identified de novo mutation in GABRB2 gene, which was previously described in literature as causing development disorders with accompanying epilepsy. The patient was first treated with valproic acid, which due to repeatable epileptic episodes was then supplemented with clobazam. During the second hospitalisation, therapy was modified with levetiracetam in response to unsatisfactory effects of treatment, what resulted in lower frequency of seizures. In 2020 ketogenic diet was applied. On the basis of decreases in glycemia and electrolyte imbalance, the ketogenic proportions were lowered from 3:1 to 2.5:1. After a half year the diet was well-tolerated, and a significant reduction of duration and frequency of seizures was observed.

**Conclusions:** Ketogenic diet is based on low carbohydrate intake. Regular fats-to-carbohydrates ratio in diet of children under age of 3 years is 3:1. The aim of this diet is to induce in organism the ketosis – a state of acidosis, in which ketone bodies replace glucose as the main energy source for brain. Anti-tremor effect appears to result from alterations of neurotransmission, stemming from changes in metabolism of neurons and influence of fatty acids on neuronal cell membranes. Ketogenic diet is nowadays considered as one of the most effective non-pharmacological treatment methods in cases of intractable epilepsy in children, which also proved to be true in presented case.

## MULTISYSTEMIC SMOOTH MUSCLE DYSFUNCTION SYNDROME: CLINICAL CASE REPORT

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**Tutor:** MD PhD Dalia Laužikienė

**Introduction:** Multisystemic smooth muscle dysfunction syndrome (MSMDS) is a rare genetic disorder associated with impairment of smooth muscle throughout the body. The syndrome is caused by heterozygous ACTA2 gene mutation. The prevalence described in 34 patients worldwide. The disease is characterized by congenital mydriasis, patent ductus arteriosus, pulmonary artery hypertension, aortic and other arterial aneurysms, intestinal hypoperistalsis and malrotation, hypotonic bladder. A genetic test should be performed to confirm the diagnosis. Symptoms usually present shortly after the birth. These individuals need PDA surgical correction, aortic aneurysm repairing, oxygen therapy and ophthalmologist consultations.

**Case Report:** A 24-year-old, pregnant woman, I pregnancy. At 12 and at 18 weeks of gestation during ultrasound no pathologies were found. At 32 weeks of gestation an ultrasound examination of the fetus revealed an increased amount of amniotic fluid, enlarged fetal bladder and expanded renal collector system. After 2 weeks the measurements showed large fetus (3015g, >97 percentile, corresponded to 36 weeks+3 days), pyelectasis of both kidneys, enlarged bladder and polyhydramnios. At 36 weeks of gestation ACTG2 gene was sequenced for suspected megacystis microcolon intestinal hypoperistalsis hydronephrosis syndrome (MMIHS). Examination revealed no pathogenic variations. Diagnosis was combined- fetal dysplasia: megacystis, ureterohydronephrosis and fetus magnus. With the development of regular labor activities on 37 weeks due to unspecified fetal disproportion, labor was completed by caesarean section. A newborn female was born- 3700g of weight, 55cm of height, rated 9/9 by Apgar. Newborn status was in serious condition due to respiratory distress syndrome, treated by CPAP, high flow nasal cannulas. Pulmonary artery hypertension, atelectasis of the upper part of the left lung, signs of hypoventilation of the upper lobe of the right lung were determined and treated by surfactant therapy. After 8 weeks of treatment, respiratory system function was improved. Patent ductus arteriosus and aneurysm have been removed, arch of aorta has been reconstructed 2 weeks after giving birth. Megacystis, ureterohydronephrosis, congenital pupillary membranes were diagnosed. Medical geneticists researched multisystemic smooth muscle dysfunction syndrome when the girl was 2 months old. ACTA2 gene mutation was detected. Now, the patient is 10 months old and has a tracheal stent for better breathing and oxygenation. High flow nasal cannulas are in use until now. Psychomotor development is normal, 9kg in weight and 71cm in height (75 percentile).

**Conclusions:** The final diagnosis is usually made when all symptoms are presented. The pathognomonic changes in the fetus begin to be seen on prenatal ultrasound (enlarged bladder and polyhydramnios). MMIHS was suspected up to childbirth, but genetic tests were negative despite all the pathognomonic signs. When the girl was two months old, ACTA2 gene mutation was found, and she was diagnosed with MSMDS.

## **Non Hepatic Alagille Syndrome Associated with Predominant Cardio-skeletal Anomalies: A Rare Case Report**

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**Presenting author:** Tanishq Sharma

**Tutor:** MD Vishal Bhende, MD Hardil Majmudar

**Introduction:** Alagille syndrome is a rare autosomal dominant genetic disorder with multisystem involvement including the liver, heart, skeleton, eyes, kidneys and other organ systems along with characteristic facial abnormalities. Symptoms range from so mild that they might remain unnoticed to severe heart and/or liver disease. Some patients with Alagille syndrome may have isolated involvement of a particular system, such as a heart defect like tetralogy of Fallot, Atrial septal defect, or a characteristic facial appearance, or an isolated vertebral body anomaly, etc. These individuals may or may not have liver anomalies or other features typical of the disorder.

**Case report:** We report a case of a 4-year-old female child with moderate ostium secundum Atrial Septal Defect (ASD) and Branch Pulmonary Artery Stenosis since 3 months of age who presented with classical features of facial dysmorphism, posterior embryotoxon in the right eye, butterfly presentation of T5 vertebra and past history of recurrent infections. Bilateral branch pulmonary artery plasty with glutaraldehyde treated pericardial patch and direct closure of the atrial septal defect leaving a patent foramen ovale (PFO) was done to correct the cardiac malformations. The surgery was uneventful and the patient was discharged after 19 days with the advise of regular follow ups.

**Conclusion:** Higher clinical suspicion is of utmost importance to diagnose such rare disorders. The focus should be on the classic criteria and to evaluate the patient based on the protocol to confirm the presence of Alagille syndrome based on clinical characteristics and to rely less on genetic testing. Currently no curative management of the disorder is available so the syndromic medical and surgical approach remains the mainstay in managing the condition.

## **Pediatric autoimmune neuropsychiatric disorder associated with streptococcal infection**

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**Introduction:** Pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS) are a subtype of acute-onset obsessive-compulsive disorder thought to be caused by an autoimmune response to group A streptococcal infection. The most common symptoms include obsessive thoughts, compulsive behavior, mood changes, separation anxiety, emotional lability. Even though these disorders are not uncommon, in some cases establishing a right diagnosis can be challenging.

**Case report:** A 13-year-old male patient presented with obsessive thoughts, compulsive and repetitive behavior, anxiety and a constant fear of being unclean. Symptoms suddenly appeared 4 months ago, without an apparent cause. There was no previous record of such symptoms. A week leading up to hospitalization the symptoms have become more severe which led to the patient's admission. After primary evaluation a diagnosis of mixed obsessional thoughts and acts was established. Due to psychotic behavior such as suspiciousness, delusions, intense cenesthopathy, a treatment of an atypical antipsychotic (Olanzapine) and an anxiolytic (Diazepam) was chosen. During hospitalization the symptoms began to worsen and the patient had developed extrapyramidal symptoms such as akathisia and Parkinsonism. The treatment was switched to a typical antipsychotic (Haloperidol) and an anticholinergic (Trihexyphenidyl) in order to reduce psychotic and extrapyramidal symptoms. Since it was failed to reach a desired therapeutic effect, it was decided to take a closer look to the patient's medical history. It was found, that the patient had recurring sinus infections since preschool and the latest sinusitis has occurred 5 months ago. Suspecting that the patient could have PANDAS it was decided to perform an ASO (antistreptolysin O) titer test. After it came back positive, a diagnosis of PANDAS was established. A combination of antibiotics (Phenoxymethylpenicillin and Amoxicillin), SSRI (sertraline) and cognitive behavioral therapy was selected as treatment and the patient was discharged from the hospital. After 4 months, during a follow-up visit it was observed, that previous repetitive, compulsive behavior has reduced and obsessive thoughts have become irrelevant, which confirmed that the diagnosis of PANDAS was in fact correct.

**Conclusion:** Differentiating PANDAS and obsessive compulsive disorder is crucial, because even though these disorders have similar clinical presentation, the treatment is different. In order to diagnose PANDAS a detailed collection of patient's infectious disease anamnesis with physical examination should be performed. When diagnosed, the successful treatment of PANDAS must include antibiotic therapy in addition to selective serotonin reuptake inhibitors and cognitive behavioral therapy.



## **Pediatric patient with Bilateral Persistent Hyperplastic Primary Vitreous (PHPV): A case report**

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Rīga Stradiņš University, Faculty of Residency

**Presenting author:** Sabīne Deksnē

**Tutor:** MD PhD Sandra Valeiņa

**Introduction:** Persistent fetal vasculature (PFV) is a rare congenital developmental ocular disorder caused by incomplete regression of the embryonic hyaloid vasculature. **Case report:** Patient, male, 1 month old was admitted to Children's Clinical University hospital with fever, unspecified bacterial infection. Routine examination revealed possible visual impairment. In examination with ophthalmoscope leukocoria was seen - thus retinoblastoma and endophthalmitis were made as differential diagnoses, Ocular ultrasound showed massive bilateral corpus vitreum opacities. During photographic documentation with Icon camera additional findings were present - synechiae and ciliary processes. Based on experience with a similar patient, unilateral persistent hyperplastic primary vitreous was put forward as the main clinical diagnosis. The diagnosis was confirmed based upon MRI findings. This clinical case was managed through a multidisciplinary and multiinstitutional approach involving several members of clinics from various countries. Patient data and images with parental approval were submitted in ERN-EYE Clinical Patient Management System. A multidisciplinary decision was made that in this case surgical treatment is not purposeful due to significant retinal anomaly being the cause of illness.

**Conclusion:** Most cases of persistent fetal vasculature are sporadic and unilateral, and bilateral PFV is rare. Among the diseases that could be associated with bilateral PFV is Norrie disease- an inherited eye disorder which is caused by a mutation in the NDP gene, which codes the Norrin protein – an important ligand in WNT cascade activation which promotes cell development and differentiation –the mutation interferes with normal development of the retina and its vasculature. For this reason, the patient was consulted by a geneticist and molecular diagnosis was performed. Unilateral and bilateral persistent primary hyperplastic vitreous is a rare ocular condition, the latter being exceptionally rare with a typically dramatic outcome. Ultrasound examination, ICON/RETCAM photo and MRI is very contributive for obtaining the diagnosis. Surgical management remains controversial

## **Rare doesn't mean impossible - a case of acute kidney injury in a 6-year-old boy with renal lymphoma**

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**Presenting author:** Julia Karska

**Tutor:** MD PhD Anna Medyńska, Prof. Danuta Zwolińska

**Introduction:** Acute kidney injury (AKI) is an aggressively developing deterioration of the organ, ultimately leading to insufficiency requiring renal replacement therapy. One of the most common causes of AKI in children are HUS and acute poststreptococcal glomerulonephritis. This case report presents a 6-year-old boy, in whom AKI developed with unclear etiology.

**Case report:** A 6-year old patient was urgently transferred in an emergency state from the district hospital to Pediatric Nephrology Clinic with tubulointerstitial nephritis and developing kidney failure. Before hospital admission the patient reported pain in the right lower limb and abdomen. In the last 3 weeks, he was treated by Ospene on an outpatient basis due to an elevated ASO titer. Additional laboratory results indicated increasing signs of AKI. Abdominal ultrasonography showed bilateral nephromegaly and a pathological change in the right iliac fossa. MRI showed infiltration in the lesser pelvis, the lumbar spine and the renal parenchyma. The clinical picture was indicative of multifocal lymphoma. The patient was transferred to the Department of Bone Marrow Transplantation, Oncology and Pediatric Hematology. Multidrug chemotherapy was administered with good results.

**Conclusion:** Kidney damage due to haemodynamic disturbances or the use of nephrotoxic medicines are the most common but not the only causes of AKI in the course of blood cancers. When determining the etiology, it's worth taking into consideration less common, but still possible causes of AKI: kidney involvement in lymphoma or tumor lysis syndrome. Maximally extensive diagnostics, increased monitoring of the patient, and response to treatment thus far administered are necessary to select the appropriate therapy and achieve the best possible clinical results.

## Recurrent Febrile Urinary Tract Infections In A 5-Year Old Girl

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**Presenting author:** Mohamed Abdel Aziz Gad

**Tutor:** MD Hesham AbdelAziz

**Introduction:** Urinary tract infections (UTIs) are one of the most common bacterial infections in pediatric urology. Medical history, examination findings and clinical course does usually vary with the patient's age and so no specific symptoms are strictly associated with recurrent UTIs. This report presents a 5 year old female patient with spina bifida occulta and recurrent history of febrile urinary tract infections diagnosed with detrusor-sphincter dyssynergia over the last year. Urodynamic study confirmed an overactive uroflow pattern with bladder outlet obstruction (BOO) and high flow obstruction with long voiding time and terminal dribbling. Early management is imperative in decreasing the risk of future complications such as UTIs.

**Case report:** A 5-year-old girl presented with recurrent episodes of recurrent febrile episodes of Urinary tract infections within the last year. complains of increased frequency of daytime urinary incontinence and foul-smelling urine since the age of 4. Past instances were diagnosed clinically, based on the presence of dysuria and abdominal pain. She was normotensive, looking nontoxic, and her physical examination of her abdomen and external genitalia was unremarkable. Her temperature was 39.0°C and her growth measures were normal. Her past medical history revealed multiple episodes of constipation, and urinalysis revealed bacteriuria. Her blood tests showed a peripheral white blood cell count of  $12.1 \times 10^9/L$ , normal hemoglobin, normal platelet count and a high C-reactive protein of 60 µg/mL. She remained febrile for 2 days.

**Conclusion:** Inadequate and lack of appropriate urological management are absolutely detrimental to upper urinary tract deterioration and renal damage caused by the high bladder pressures and hence the recurrence of urinary tract infections (UTIs). Deterioration associated with chronic BOO is directly correlated to inadequate compliance and high-storage pressures of the bladder, therefore the finding of impaired contractility with BOO is an absolute indication for management. Therefore, voiding cystometrogram and voiding pressure flow study are required in evaluating the degree of potential obstruction. The main objectives of urological management in spina bifida patients are 1) maintenance of a healthy upper urinary tract; 2) preservation of renal function; 3) resolving nocturnal enuresis to improve the patient's overall quality of life; 4) achieving continence. Renal function preservation and early resolution of nocturnal enuresis are imperative in improving the quality of life for spina bifida patients with recurring UTIs. This patient's multiple UTIs are mainly due to intravesical pressure from post residual urine after incomplete voiding. Consequently, converting high-pressure bladder with outlet obstruction based on detrusor/ sphincter dyssynergia into a low-pressure storage that is safe for the upper urinary tracts and reducing that risk is the primary aim of therapy.

## Severe congenital disorder of brain

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**Presenting author:** Cyntia Szymańska

**Tutor:** MD PhD Karolina Gruca-Stryjak

**Introduction:** Lissencephaly (also called “smooth brain”) is a brain malformation, caused by a deficient neuronal migration during embryonic development. It is characterised by unformed gyri, dysmorphic features and neurological disorders. Patients also suffer from drug-resistant epilepsy and have difficulties with nutrition. It may be an isolated impairment or a part of a genetic syndrome. There are more than 20 genes identified as responsible for lissencephaly. The most common gene is PFAH1B1 (platelet-activating factor acetylhydrolase isoform Ib gene) also known as a LIS1, involved in up to 80% of cases. Prognosis in lissencephaly is severe and depends on the degree of brain malformation in imaging. Some of the patients die in the first years of life, others survive without any significant development and are completely dependent on care.

**Case report:** Parents of a 9-month-old girl with psychomotor development delay and seizures after normal pregnancy and labour went to the genetic counselling. At the age of 6 months the child was admitted to the neurology department, where lissencephaly, pachygyria, extendedness, uncorrect course and reduction of sulci and abnormalities in the cortex were diagnosed with a head MRI. In physical examination increased muscle tension, dysmorphic features, small head circumference and growth retardation were found. To determine a genetic cause of malformation, whole genome sequencing was performed and not previously described heterozygous variant de novo of gene PFAH1B1 was found. Despite poor prognosis, development of our patient is quite satisfying and its progression is continuously observed: at the age of 17 months, a girl was able to carry a bottle or reach for a toy. One year later, she was sitting and eating by herself, standing with a support and communicating with short expressions. Last seizure was noticed at the age of 1 year.

**Conclusion:** Majority of genetic disorders have a diversified clinical picture. As its reasons, locus heterogeneity, allelic heterogeneity, or changing expression should be considered. Due to this fact, it is difficult to forecast further development of a patient in details. If possible, detailed diagnostic of genetic variant type using high-throughput sequencing type should be implemented in order not only to find genotype-phenotype correlation, but also to identify the risk for relatives.

## SLC25A4 mutation related mitochondrial myopathy: A rare case with challenging clinical management

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**Tutor:** MD Madara Kreile

**Introduction:** Mitochondrial myopathies are progressive myopathies caused by the impairment of oxidative phosphorylation (OXPHOS). A number of proteins are required for proper function and maintenance of the respiratory chain. The majority of these proteins are nuclearly encoded. One of these genes SLC25A4 (Solute Carrier Family 25 Member 4) is a protein coding gene which encodes for the ADP/ATP gated pore carrier AAC1. Mutations in the SLC25A4 gene result in either multiple mtDNA deletions or in depletion of the mtDNA. Patients carrying a SLC25A4 mutation not only manifest with encephalo-myo-cardiomyopathy but also with scoliosis, lordosis, cataract, hydrocephalus or arterial hypertension.

**Case report:** A 2-year old girl presented to the neurology clinic at the Children's clinical University Hospital for hypotonia, secondary lordosis and motor developmental delay. Girl was born at term weighing 3,090 g and was the first child of healthy non-consanguineous Latvian parents. Apgar scores were 8 and 9 at 1st and 5th min. At 2 months of age she was diagnosed with muscular hypotonus and physiotherapy was recommended. Neurologic examination at presentation was remarkable for peripheral muscle hypotonia, lordosis, facial hypotonia. EMG showed signs of axonal neuropathy. Magnetic Resonance Imaging was performed and showed no pathology. Echo-cardiography were normal. Girl height was 83cm and weight 10,6kg. Laboratory workup found elevated creatine kinase (CK) (379 U/L, reference 60–305) and lactic acidosis (4.46 mmol, reference range 0.5–2.2), elevated ketones and Krebs cycle metabolites in urine. Therefore, subsequent genetic testing were pursued. Clinical testing for nuclear mitochondrial disease genes and full mitochondrial DNA (mtDNA) sequencing (in blood) were obtained via the next-generation sequencing panel. Sequence analysis identified a heterozygous missense variant c.704>T, p.(Arg235Leu) in SLC25A4. This variant was considered as likely pathogenic. There is no Family history with similar disease. Initially patient received treatment with coenzyme Q10 (200 mg/day) and L-carnitine (1000mg/day) adding riboflavin (140mg/day) and thiamine (60mg/day) when she developed intolerance and persistent diarrhea. Treatment doses was reduced but intolerance was still remaining. After year of treatment condition of the patient is slowly deteriorating. Girl weigh is only 11.6 kg due to persistent diarrhea and feeding difficulties according to progression of myopathy.

**Conclusion:** We report the rare case of SLC25A4-associated mitochondrial myopathy focusing on difficulties of clinical management. There are currently no effective or disease-modifying treatments available for the majority of patients with mitochondrial myopathies. Instead, existing therapeutic options focus on the symptomatic management of disease manifestations, helping to improve the patients' quality of life. Treatment includes various vitamins, cofactors, and nutritional supplements.

## **Spontaneous Bleeding To Central Nervous System Or Child Maltreatment Syndrome – A Differentiation Based On Descriptions Of Two Clinical Cases.**

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**Presenting author:** Julia Bargieł

**Tutor:** MD PhD Agata Tarkowska

**Introduction:** Spontaneous bleedings to central nervous system, among infants usually occurring in a group of premature babies, are a major directly life-threatening problem. Among the most common causes of a bleeding one can include: perinatal head injuries, congenital disorders, brain hypoxia and disturbances of blood coagulability. Although these situations can happen randomly in every infant, one should take into consideration a fact that a bleeding to central nervous system is one of the key elements of the child maltreatment syndrome. This work presents descriptions of two cases in which a bleeding to central nervous system in an infant was observed, among which one was a result of maltreatment.

**Case report:** A 6-weeks-old girl was admitted to a Neonatal Pathology Ward, where she was referred from a private facility to which a mother had made an appointment, because of the worries about an increase of the head circumference of the child. In the above-mentioned facility, signs of an increased intracranial pressure were noticed in a transfontanelle ultrasonography. Interview from the mother was clear and consistent. No injuries were found on the body of the child. An ophthalmological examination showed no changes in the fundus of the eye. A CT scan showed a significant widening of the pericerebral space (chronic hematomas) without any post-traumatic changes in the skull bones. An intracranial hemorrhage (non-traumatic) was recognized. A 5-week-old boy was admitted to a Neonatal Pathology Ward. The reason of the admission was a referral from a primary care doctor who was worried about the state of the child during an obligatory appointment. Interview from the mother was inconsistent, at first she stated that the child had fallen from a couch a few days before, later she refused that statement. At the moment of admission, patient's condition was moderately severe. Ecchymoses were found in left axillary region and left knee. Meningeal signs were present. In diagnostic imaging a massive intracerebral hemorrhage and multiple fracture fissures in the skull bones were found. An ophthalmological examination showed pathognomonic retinal hemorrhages. A child maltreatment syndrome was recognized.

**Conclusion:** A comparative description of both cases acknowledges the essence of proper differentiation of the child maltreatment syndrome and spontaneous, unintentional bleedings to the central nervous system. Children with bleeding need to undergo a precise interview and physical examination. In case of noticing signs of abuse, this fact must be reported immediately. Awareness of the problem and publicizing particular cases will contribute to the sensibilization of the society and thus will reduce the maltreatment of the children.

## Suspicion of Jacobs syndrome in a 9-month-old boy

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**Tutor:** MD PhD Alina Kowalczykiewicz-Kuta

**Introduction:** Jacobs syndrome is caused by a quantitative aneuploid type chromosome disorder characterized by the presence of an additional Y chromosome in men. XYY syndrome occurs in approximately 0.1% of the male population. It is estimated that this number is significantly underestimated due to the lack of genetic screening. To confirm Jacobs syndrome, a man must have an XYY karyotype and clinical signs such as physical and behavioral features. Physical features include high growth, while behavioral features include developmental delay, speech disorder, cognitive impairment, and emotional and social development difficulties. What is more, the IQ level is often reduced by 10 to 15 points compared to siblings.

**Case report:** A boy born by nature during the first pregnancy. It was a threatened pregnancy because genital bleeding occurred at the 9th week of pregnancy. At the 13th week of pregnancy, abnormal flow on the tricuspid valve (retrograde wave) was observed, therefore, at the 16th week of pregnancy, an amniocentesis was performed, in which the karyotype 47, XYY was found. Since birth, the patient's weight, height, and circumference exceed the mean values. The patient had problems with food intake such as downpouring and an undercutting of the frenulum was performed at 3 months of age. The patient was also diagnosed with reduced muscle tone and poor eye contact.

**Conclusions:** The infant develops abnormally. Time standards in the implementation of milestones have not been observed. The child has some features that may suggest the occurrence of Jacobs syndrome, they are hypotension, low, but normal body weight with concomitant tall growth. At present, the child does not show behavioral and social problems. XYY syndrome is difficult because there are only symptomatic treatment options, consisting of minimizing discomfort.

## The Importance Of Essential Six In Diagnostics Of Brain Abnormalities In Mowat-Wilson Syndrome -Case Report

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**Presenting author:** Natalia Anna Lehman  
**Tutor:** MD PhD Magdalena Maria Woźniak

**Introduction:** Mowat-Wilson syndrome is an ultra-rare genetic condition which is caused by different mutations or deletions of ZEB 2 gene. The clinical manifestations of this disease include among others mental retardation, delayed motor development, distinctive facial appearance, ventricular septal defect, Hirschsprung disease. Mowat-Wilson syndrome is characterized by typical abnormalities in central nervous system, the most common ones are usually anomalies of the corpus callosum and hippocampal malformations. An useful method to demonstrate these lesions is Magnetic Resonance Imaging (MRI).

**Case report:** We present a case of a ten year old boy who was diagnosed with Mowat-Wilson syndrome at the age of two. The symptoms included pulmonary arteries stenosis, hypospadias, intellectual disability, aggressive behaviour and precocious puberty. The boy had a first epilepsy attack when he was two years old. Epileptic seizures were reduced by 50% and past six years re-increased again. Therefore the head MRI in an Essential Six protocol under general anesthesia was performed. There were no focal lesions in the brain . Magnetic resonance scan confirmed agenesis of corpus callosum, absence of cingulate gyrus, asymmetry of lateral ventricles and colpocephaly.

**Conclusion:** The MRI performed in an Essential Six protocol is the method of choice in confirming central nervous system abnormalities. In this case we demonstrated the usefulness of Magnetic Resonance Imaging to assessment of changes in the structure of the brain characteristic for Mowat-Wilson syndrome and associated with epilepsy attacks.



## Unexpected prolonged neuromuscular blockage in a pediatric patient

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**Presenting author:** Viktorija Kenstavičiūtė

**Tutor:** MD Vilma Kakštienė

**Introduction:** Mivacurium is a selective, short-acting, non-depolarising muscle relaxant, which is used to facilitate tracheal intubation and provide skeletal muscle relaxation during surgery or mechanical ventilation. A standard intubating dose of 0.2 mg/kg in children (aged 2 – 12) causes complete neuromuscular depression in 1.5 - 2 minutes and spontaneous recovery is 95% complete in approximately 15 to 20 minutes. As mivacurium is hydrolyzed by pseudocholinesterase (PCE), a deficiency in this enzyme may result in a prolonged blockage. In this case, we present an unexpected prolonged neuromuscular block in a child after a single dose of mivacurium.

**Case report:** A 7-year-old boy underwent bilateral adenotonsilectomy. The patient had not been anaesthetized in the past and there was no family history of adverse reactions to anesthesia. He did not take any medication and denied drug allergies. Physical examination revealed a healthy 32 kg male within normal range. For induction of general anesthesia 0.05 mg fentanyl and a single dose of 3 mg mivacurium were infused, followed by endotracheal intubation 2 minutes later. In this case, only half of the recommended dose (0.09 mg/kg) of neuromuscular blocker was used. Anesthesia was maintained with 1 MAC (minimum alveolar concentration) sevoflurane in oxygen. Surgery lasted 50 minutes uneventfully and anesthesia was continued in the operating room for another 20 minutes. However, complete recovery from anesthesia was complicated by respiratory failure due to residual action of mivacurium. For safe extubation, he was transferred to the intensive care unit. The Mechanical Ventilation P-SIMV-Mode was continued, and consciousness was additionally sedated with intravenous midazolam 2.5 mg and propofol 50 mg doses. Full spontaneous respiration was restored after 230 minutes after a single bolus of 0.09 mg/kg mivacurium with safe extubation.

**Conclusion:** In this case report, we described a prolonged neuromuscular blockage after a single dose of mivacurium due to suspiciously decreased activity of PCE. It is currently not practical to screen for all presurgical cases of pseudocholinesterase deficiency if the patient has no family history of this disorder. Usually, for faster non-depolarising neuromuscular-blockage recovery, neostigmine is used as an antidote. However, the current use of this antidote is still under discussion because it may potentially prolong the mivacurium induced neuromuscular-blockage and should only be used when the majority of neuromuscular activity has returned.

## **Prenatal diagnosis of large lymphangioma - Case report and literature review.**

Angelika Ozga

Medical University of Lodz

**Presenting author:** Angelika Ozga

**Tutor:** Prof. Maria Respondek-Liberska

**Introduction:** Fetal lymphangioma is an uncommon congenital malformation of the lymphatic system, characterized by a thin-walled cystic dilation due to lack of communication between the lymphatic and venous systems. It is mainly located in the neck. The prognosis and procedures are dependent on location, infiltration of surrounding structures and perinatal complications are possible. The aim of this study was to present our recent case along with diagnostic approach and review of current treatment methods.

**Case report:** 29-year-old pregnant woman (in low-risk pregnancy, 1st and 2nd US exams reported as normal) was referred to our Department at 35 weeks' gestation, because of a fetal neck mass revealed by routine obstetrical ultrasonography. Detailed US + ECHO exam demonstrated a cystic-solid tumor with multiple septa in the posterior region of the neck (77 x 45 mm) with high resistance vascularization. There was normal heart anatomy and normal heart study, so the fetus well-being was confirmed. Due to size of the tumor elective CS was scheduled on 38 weeks of gestation. Neonatal examination including clinical assesment, US + ECHO and postnatal MRI confirmed the prenatal diagnosis. A male infant was qualified to needling and Picibanil (OK-432) injection, in the 1st, 2nd and 3rd month of life in Pediatric Surgery Department. Despite of this there was progressive increase of tumor's volume, but at the 4th month of life there was "spontanous" regression.

**Conclusion:** PubMed databases (2015-2020) were searched to analyze the latest methods of management and treatment of fetal lymphangioma. From over 500 records initially found, ten studies, including 65 cases, were identified as relevant and included in the systematic review. For the management of lymphangioma diagnosed prenatally, the first step was cytogenetic study, followed by detailed fetal anatomical sonography and echocardiography. Prognosis and optimal treatment were discussed by multidisciplinary team. There are several options: expectant management in cases of small lymphangiomas and normal karyotype and no serious structural abnormality. Prenatal therapy with sclerosing agents, could be considered for "good" located lymphangiomas. Postnatal management may include direct injection of sclerosing agents, followed by surgical excision. In x publication an oral sirolimus was suggested as a new option.

There is still no consensus and prenatal or postnatal optimal methods of treatment, so every case is a challenge and due to its rare prevalence should be published to share its course with medical society.

## Late diagnosis of Hodgkin's lymphoma in a 17-year-old female patient

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**Presenting author:** Oliwia Piotrowska

**Tutor:** MD PhD Tomasz Ociepa

**Introduction:** Hodgkin's lymphoma is a cancer of the lymphatic system, accounting for 5% of all cancers in children and adolescents. Its most common manifestation is enlargement of the lymph nodes in the neck and chest area.

**Case report:** The 17.5-year-old patient was referred to the hospital on September 7, 2020 for suspicion of a proliferative disease. From June 2019, a package of enlarged supraclavicular lymph nodes on the left side was observed. The initial assessment of the patient was performed in June 2019 at the SOR SPSK 1, where lymphoma was suspected. In order to perform a histopathological examination, the date of nodal collection and an appointment at the Hematology/Oncology Clinic were established. Unfortunately, the mother and daughter did not appear. The patient's mother was contacted several times by phone, obtaining a lack of consent for the diagnosis and hospitalization of the daughter, and receiving assurances that she would treat the child herself. The delay lasted 15 months. During this time, the patient received homeopathic products, Levo-Vitamin C infusions, and underwent bioenergotherapy treatments. Finally, on September 7, 2020, the patient appeared in the hospital. The patient's mother consented to further diagnostics and treatment only after receiving information that the Clinic's doctor had contacted the Family Court's duty judge, who informed that in the event of refusal of hospitalization, a procedure for limiting parental authority would be initiated. On admission, the patient was cachectic, anemic, with pale, dry skin and numerous cuts, scars, ulcerations all over the surface. In the physical examination, a monstrous nodal mass, modeling the outline of the neck and lower 1/3 of the face. Axillary nodes arranged in bundles, up to 8-10 cm in size. Hodgkin's lymphoma was diagnosed based on the histopathological examination of the lymph node. The PET examination showed involvement of the cervical, axillary and thoracic lymph nodes, as well as involvement of the spleen and marrow. The patient started chemotherapy according to the EuroNet-PHL-C2 program.

**Conclusion:** One of the important factors that improve the prognosis in the treatment of lymphomas in children and adolescents is the stage of the disease. A delay in diagnosis and treatment significantly reduces the chance of achieving a permanent remission of the disease from 95% in stage I (probably our patient's baseline state) to 75% in stage IV (as of September 2020). The use of the so-called alternative medicine does not provide benefits in the treatment of neoplastic diseases and increases the chances of failure of appropriate anticancer therapy. "

## **DENTISTRY**

COORDINATORS: Zuzanna Chrzanowska, Bartosz Mazur

JURY:

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## **The State Of Hygiene In Adolescents And Young Adults With Inflammatory Diseases Periodonts Of Smoking.**

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**Presenting author:** Iryna Lisetska

**Tutor:** Prof Rozhko MM

**Introduction:** Smoking is the most common epidemic in the world. Experts assess the situation with smoking in Ukraine as critical, as more than 500 thousand young people join this habit every year (Shcherba VV, Lavrin O.Ya., 2016; Korolyova ND, etc., 2019). Tobacco smoking is very common among adolescents and young adults, one in three children aged 12-14 and one in two children over the age of 15 smoke cigarettes. In adolescence, very quickly becomes addicted to cigarettes (Picas OB, 2016). Adolescents are known to be most vulnerable to the effects of tobacco smoke on its toxic and allergenic effects due to the immaturity of functional physiological mechanisms of regulation of organs and systems (Goniewicz ML et al., 2014; Zakut Yara Salah et al., 2021). Smoking has been shown to be an important simulated risk factor for oral diseases. The oral cavity is the first barrier to tobacco smoke in the human body. Therefore, the study of the level of oral hygiene in adolescents and adolescents who smoke with inflammatory diseases of periodontal tissues in order to further develop a scheme of treatment and prevention remains one of the relevant areas of pediatric dentistry.

**Aim the study:** The purpose of the study is to study the state of oral hygiene in adolescents and adolescents who smoke with inflammatory diseases of periodontal tissues.

**Material and methods:** To achieve this goal, the state of oral hygiene was determined using the oral hygiene index Green-Vermillion (IG) (Oral Hygiene Index-Simplified, Green-Vermillion, 1964) in 156 adolescents and adolescents with catarrhal gingivitis from 15 to 24 years, which were divided into groups: Group I included 46 patients who regularly smoke traditional cigarettes; in group II - 32 patients who regularly smoke electronic cigarettes (Vaipy); in group III - 29 patients who regularly smoke tobacco heating devices (IQOS); in group IV - 49 non-smoking patients. The obtained digital material was subjected to statistical analysis using Student's T-test.

**Results:** Analyzing the results of the state of oral hygiene, it was found that patients of group I have an unsatisfactory state of oral hygiene, the average value of the hygiene index was  $1,74 \pm 0,03$  points. In patients of groups II and III, this indicator was slightly lower, respectively  $1,62 \pm 0,02$  and  $1,57 \pm 0,01$  points, which corresponds to a satisfactory state of oral hygiene. In patients of group IV, the state of hygiene was also satisfactory, but the index was lower –  $1,39 \pm 0,02$ .

**Conclusions:** Thus, there is an increase in oral hygiene depending on the presence of a bad habit of smoking, and in patients who smoke modern alternative smoking, the corresponding rates are also higher than in patients without a bad habit of smoking, which requires increased effectiveness of treatment, prevention and treatment. language condition - to stop smoking, after all, without smoking cessation there will be no positive results in the treatment of periodontal diseases.

## Impact of Covid-19 On Dental Health

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**Presenting author:** Iryna Lisetska

**Tutor:** Lisetska Iryna

**Introduction:** More than a year has passed since the world's population faced a new dangerous enemy, the previously unknown SARS-CoV-2 virus, which has forever changed and continues to make adjustments to all established mechanisms of life without exception. The emergence and spread of the virus has become the most discussed topic, as in a relatively short period of time, it has caused a pandemic called COVID-19 worldwide. This has become a global health problem. The source of infection, transmission mechanisms, pathogenesis, primary and secondary manifestations of this disease, scientists continue to study both abroad and in Ukraine. COVID-19 causes changes in many organs and systems throughout the body, including the oral cavity.

**Aim of the study:** The aim of the study was to analyze the current literature on the effects of SARS-CoV-2 on the condition of the oral cavity, to identify features of the disease in the oral cavity in IFNMU students and to provide recommendations for reducing COVID-19 infection in dentistry.

**Material and methods:** The analysis of modern domestic and foreign literature, questionnaires of 187 students of dental and medical faculty of I-VI courses is carried out. The questionnaire is based on a list of questions proposed by the WHO to establish the level of dental culture of the population, as well as our appendices. The questionnaire contains 20 questions characterizing the impact of SARS-CoV-2 on the condition of the oral cavity, various aspects of information, subjective assessment of dental status (separately to assess the condition of teeth, periodontal tissues and oral mucosa), understanding and awareness of the need to comply individual oral hygiene and basic concepts of oral hygiene.

**Results:** Analysis of the literature has shown that the SARS-CoV-2 virus causes diseases of organs and systems, including changes in the oral cavity. It was found that the active use of rinses, which include tin fluorides, zinc ions and cetylpyridine chloride, neutralize 99.9% of viruses after 2 minutes of use. The survey showed that about half of the respondents became ill with COVID-19, most of them complained of changes in dental status: lack of taste, bad breath (halitosis), candidiasis, xerostomia. According to the survey, the restoration of taste took place at different times, according to which we formed three groups. In the first group, the return of taste occurred within 3-14 days, in the second - from 14 days to 1 month, and in the third group the term was more than one month, while only 3.9% of respondents performed procedures aimed at restoring taste. About 6% of respondents complained of halitosis, 2.3% complained of candidiasis, and 18.8% complained of xerostomia.

**Conclusion:** The results of the work proved the relevance of the topic, the need for further more comprehensive study and development of modern protocols, and recommendations for this group of patients and an active information program.

## **Influence of unilaterally impacted maxillary canines on maxillary transverse dimension**

Ieva Ozola

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**Presenting author:** Ieva Ozola

**Tutor:** Ieva Mauliņa

**Introduction:** In European population, the average prevalence of impacted canines is 0,8-8,4 %. Numerous etiological factors are involved in buccal and palatal canine impaction, but their exact influence is not completely clear. Although it has been hypothesized that palatally impacted canines often have sufficient space in dental arch (whereas buccally impacted canines are generally associated with dental or skeletal deficiency), the results of transversal dimension studies are inconclusive.

**Aim of the study:** To determine whether there is a difference in the maxillary transverse dimension between the impacted canine side and the opposite side without canine impaction using cone-beam computed tomography.

**Method:** In this retrospective study, 79 cone-beam computed tomography images of patients with unilaterally impacted maxillary canine (58 palatally, 21 buccally) were analyzed. Measurements of the maxillary transverse dimension were performed at dental, alveolar and basal levels on the first premolar and first molar on both sides of the maxilla with a freeware 3D Slicer. Two independent sample t-test and Mann-Whitney U-test were used.

**Results:** No significant differences in the maxillary transverse dimension were found between the impacted canine side and the opposite side without canine impaction in any of the measurements in both the palatally and the buccally impacted canine group.

**Conclusions:** There is no difference in the maxillary transverse dimension between the impacted canine side and the opposite side without canine impaction. This suggests that the maxillary transverse dimension could not be considered a major factor in the genesis of canine impaction."

**Knowledge and awareness of the COVID-19 pandemic among dentistry students at the Medical University of Warsaw**

Viktoriiia Pukhalska, Viktoriiia Pukhalska, Beata Godowska, Katarzyna Koziarska

**Presenting author:** Viktoriiia Pukhalska

**Tutor:** MD PhD Anna Turska-Szybka

**Introduction:** COVID-19 pandemic significantly affected the entire population.

**Aim of the study:** This study aimed to analyse knowledge, awareness of SARS-CoV-2 virus and COVID-19 pandemic and their impact on dentistry students at the Medical University of Warsaw (MUW).

**Material and methods:** The questionnaire sent to all years dentistry students at MUW was filled online and consisted of 33 questions on coronavirus, COVID-19 pandemic, groups of increased risk, diagnostics, prevention, sources of information and the impact of the pandemic on students. The obtained data were analyzed using basic descriptive statistics, significance of dependencies and chi square test;  $p < 0.05$ .

**Results:** Questionnaires were fully completed by 307 students aged 18 to 32 (mean  $22.2 \pm 2.40$  years), including 240 women and 67 men. Students answered correctly on 76% of questions on SARS-CoV-2 virus and COVID-19, 64% on diagnostics and 53% on prevention. The association between the student's knowledge and their year was statistically significant ( $r = 0.172$ ,  $p < 0.001$ ). Final year students achieved significantly higher scores of proper answers (56.8%), while first year students the lowest (50.3%). The age and gender of the students was also significantly associated with their awareness and attitudes ( $r = 0.150$ ,  $p = 0.131$  and  $r = 0.164$ ,  $p < 0.05$ , respectively). Over half (60%) of participants felt anxious about the pandemic, and 68% felt a negative impact on their lives. Nearly 94% indicated medical staff as the at-risk group during COVID-19 pandemic, followed by seniors (93.5%) and dental staff (90.2%). Main sources of information included The Ministry of Health (51.8%) and WHO (50.8%) recommendations, TV (51.5%), and Facebook (46.9%).

**Conclusions:** The knowledge and awareness of the dentistry students about the COVID-19 pandemic is not sufficient. Only half of students follow the information on the COVID-19 on an ongoing basis. Students are concerned about the situation, and anxious. The guidelines should be sent to all students.



## Knowledge and attitude of Polish dentists during the COVID-19 pandemic

Maria Prokopczyk

Medical University of Warsaw

**Presenting author:** Maria Prokopczyk

**Tutors:** Prof. Anna Turska-Szybka, Prof. Dorota Olczak-Kowalczyk, Prof. Piotr Winkielman

**Introduction:** Dentists are at high risk of becoming infected with SARS-Cov-2. They were issued a number of recommendations during the pandemic.

**Aim of the study:** The study aimed to analyze Polish dentists' knowledge of the SARS-CoV-2 virus, determine changes and the main problems in their work.

**Methods:** The online anonymous survey included 741 dentists. A questionnaire consisted of 57 questions relating to socio-demographics, knowledge about COVID-19, office procedures. The obtained data were analyzed using basic descriptive statistics, significance of dependencies and chi square and Mann-Whitney tests;  $p < 0.05$ .

**Results:** Ultimately, 730 questionnaires were included. The mean age was  $43.62 \pm 11.57$ . Almost 3/4 of the respondents followed the information on the COVID-19 on an ongoing basis. The vast majority (95.5%) had knowledge about COVID-19. Genetic testing was the basic test according to 69.2%. 56.0% were concerned about the pandemic, and 23.6% were significantly anxious. 42.1% considered a risk of infection with the SARS-Cov-2 in the workplace as very high. 84.0% admitted patients performing a triage and using personal protective equipment (PPE). 44.5% planned to get vaccinated. Continuing the work during the pandemic was strongly correlated with age, sector, place and length of work, and overall health.

**Conclusions:** Most Polish dentists follow the information on the COVID-19 on an ongoing basis and have knowledge about COVID-19. Dentists are concerned and anxious about the situation. The vast majority admit patients during a pandemic and use PPE. Only almost half plan to vaccinate.

## **The Knowledge About Premature Loss Of Deciduous Teeth And Space Maintenance Of Lithuanian Dental Practitioners With Less Than Five Years Of Work Experience**

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**Tutor:** MD PhD Arūnas Vasiliauskas

**Introduction:** Deciduous teeth are important for an appropriate development of the dental arch. Premature loss of deciduous teeth is one of the most common complications of dental caries, which can lead to unwanted tooth migration, space loss, and crowding of teeth. problem can be prevented and controlled by the use of space maintainers. In order to avoid future orthodontic problems, dentists must be well aware of premature deciduous teeth loss and options for space maintenance.

**Aim Of The Study:** The aim of this study is to analyse Lithuanian dentists' with less than 5 years of work experience knowledge about premature deciduous teeth loss space maintenance.

**Materials And Methods:** An anonymous survey of 36 closed questions was prepared for Lithuanian dental practitioners with less than 5 years of practical work experience. The survey was posted on a website named manoapklausa.lt and Facebook.com group of Lithuanian dental practitioners, called "Lietuvos odontologai". Statistical data analysis was performed using "IBM SPSS" program, version 24.0. In analytical statistics, two-dimensional data analysis of the Chi-square ( $\chi^2$ ) criterion was applied to compare the distribution of phenomena between groups, when its assumptions are not met, Fisher's exact criterion (F) was applied. The value of  $p < 0.05$  was considered statistically significant.

**Results:** A total of 166 Lithuanian dentists participated in the study. A correlation between the amount of knowledge about premature deciduous teeth loss and space maintenance of Lithuanian dentists with less than 5 years of practical work experience and the frequency of practical work with children was found. Dentists working with children daily more often responded to survey questions correctly compared to those working with children only a few times per year ( $p < 0.05$ ). Fifty percent of surveyed dental practitioners estimated their knowledge about space maintenance and premature deciduous teeth loss to be "satisfactorily", while more than third of the participants (38.6%) evaluated their knowledge as being "good" and only 6.6% of participants responded to their knowledge as being "very good". The rest of the participants (4.8%) evaluated their knowledge as being "poor".

**Conclusions:** Dental practitioners that work with children daily have better knowledge about primary teeth loss and space maintenance than those who work with children only a few times per year. Most of the dental practitioners that participated in the study evaluate their knowledge as being poor, therefore, it is essential to renew and expand awareness of prevention of deciduous teeth loss and methods for space maintenance.

## **Efficacy Of Reciprocating, Rotary Systems And Hand Files In Removing Gutta-percha With Different Obturating Techniques**

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**Presenting author:** Gaile Bardijevskyte

**Introduction:** Endodontic treatment failures cause periapical bone destruction, pain, swelling and it can lead to loss of the tooth. In order to reduce symptoms, re-establish healthy periapical tissues it is important to carry out an effective technique of filling material removal.

**Aim of the study:** The aim of this work is to do a systemic analysis based on reviewed articles related to the selected topic. Moreover, to compare hand, rotary and reciprocating instruments for a removal of gutta-percha and evaluate obturation methods with gutta-percha that are easiest to remove during endodontic retreatment.

**Material And Methods:** Systematic review was performed based on PRISMA guidelines. PubMed/ Medline, Willey Online Library databases were used for the search of articles. All selected studies were published between January 1, 2011 and January 1, 2021.

**Results:** There were found 331 articles related to the selected topic. After applying inclusion/exclusion criteria 15 publications enrolled in this systematic review. Eleven studies compared rotary, reciprocating systems and hand files, three studies evaluated characteristics of removing gutta-percha obturated with Warm vertical compaction, Cold lateral condensation, Thermafil and GuttaCore methods and one study compared both instruments and obturating techniques.

**Conclusions:** Reciprocating systems required less time to reach working length, removed gutta-percha faster and produced smaller amounts of apically extruded debris compared with rotary systems, hand files. Retreating curved canals in molars Mtwo system removed a significantly greater amount of gutta-percha and required less time for removal compared with Reciproc system. Retreating root canals obturated with GuttaCore required less time for reaching working length and removing filling material.

**Assessment of the level of anxiety related to the SARS-CoV-2 pandemic among polish dentistry students and trainees.**

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Medical University of Wrocław

**Presenting author:** Magdalena Papuga

**Tutors:** MD PhD Katarzyna Skośkiewicz-Malinowska, MD PhD Tomasz Staniowski

**Introduction:** COVID-19's pandemic has rapidly spread around the World. It has changed the performance of the whole health care system, including dentistry services and educational processes in polish medical universities. Both dental practitioners and dentistry students begin to perceive their everyday duties differently.

**Aim of the study:** The aim of this study was to examine the level of anxiety and fear related to carrying out various dental procedures and contacting patients according to higher epidemic risk during SARS-CoV-2's pandemic. As well as, examination of satisfaction's rate according to the educational process which was executed via the Internet.

**Method:** This survey has been conducted within 104 samples of polish dentistry students and trainees, associated with 8 polish medical universities. The questionnaire included 10 questions on various clinical aspects of the current epidemic situation. The data was statistically analysed by the program STATISTICA v. 13.0 (StatSoft USA)

**Results:** At the time of testing no participants were found to be infected by SARS-CoV-2. Among dental procedures, those attributed to production of high amounts of water-air aerosol, such as mechanical scaling and tooth preparation for prosthetic restorations are marked by the highest level of fear and anxiety. Dental students and trainees were dissatisfied with the inability to acquire practical skills. Dentistry students were especially afraid of contact with health care workers which might have direct contact with people suffering from SARS-CoV-2, although they are not afraid to stay among small groups of students. 66,4% of them were dissatisfied by carrying out on-line clinical classes. The students experienced least anxious in the case of dental check-up, orthodontic treatment, dentures restoration or administering local anaesthesia.

**Conclusions:** The lack of substantive information according to the way of protection against COVID's infection and separation from direct contact with patients are the main factors which increased the level of fear among dental students and trainees. Merely 42,3% of students admitted that the university provides them with access to personal protective equipment after returning to clinical classes. As more information is available on protection against infection and access to vaccination, the fear of infection during a pandemic should decrease.

## **The comparison of occlusal patterns and malocclusion disharmonies between children with Down Syndrome and healthy children**

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Tutor: MD PhD Magdalena Marczyńska-Stolarek

**Introduction:** Down syndrome is one of the most common genetic disorders. Patients with trisomy of the 21st chromosome display a range of abnormalities of varying severity in the oral cavity. A number of disorders of the stomatognathic system and the orofacial complex have a significant impact on the patients' quality of life. Therefore, orthodontic treatment should be an integral part of comprehensive medical care the patients require from early childhood.

**Aim of the study:** The study aims to analyse and compare occlusion in children with Down syndrome in relation to healthy children in the same age group.

**Materials and methods:** The research material consisted of 22 children with Down syndrome and 33 healthy children unburdened by genetic defects, all aged 7-16. The extraoral examination included the analysis of facial features in relation to the sagittal, fronto-orbital and Frankfurt planes. During the intraoral examination the following features were assessed: Angle's class, canine class, overbite, overjet, incisor retrusion / protrusion. Abnormalities concerning the structure and number of teeth as well as dysfunction of the tongue were analyzed. A functional examination was carried out in order to assess the tension of the mimic and masticatory muscles. We also conducted a questionnaire study to determine the general health of the patient. Statistical analysis using chi-squared test was performed with p-value <0.05 considered as statistically significant.

**Results:** The most common type of malocclusion among DS patients was bilateral partial crossbite - 59% vs 14% within the healthy group. A partial anterior openbite was also diagnosed more frequently (33% vs 5%). The prevalence of Angle class III was higher in children with Down syndrome (25% vs 15%). Incorrect overbite was observed in 68% of DS patients compared to 33% in the healthy group (p-value <0.013). 68% of DS patients exhibited incorrect overjet which was only observed in 37% of healthy patients (p-value <0.024). Hypodontia was diagnosed only among children with DS (50%). Muscular hypotonia occurred in 55% of DS patients compared to 4% in the control group. Dysfunction of tongue muscles was also predominant in DS group (41% vs 6%) as well as infantile type of swallowing (74% vs 30%).

**Conclusions:** Our study finds that there is a positive correlation between Down syndrome and the prevalence of various disharmonies in the stomatognathic system. They include malocclusion, teeth abnormalities concerning their number and structure, hypotonia of mimic and masticatory muscles and infantile type of swallowing. All of the above-mentioned abnormalities occur more frequently in children with Down syndrome compared to children unaffected by any genetic disorder.

## **Comparison of interdental brushes and dental floss effectiveness in removal of dental plaque from interproximal areas- randomized trials.**

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**Presenting author:** Martyna Ziomek-Świątkiewicz

**Tutor:** Prof. Natalia Lewkowicz

**Introduction:** Among many methods of cleaning interdental spaces, using dental floss or interdental brushes seems to be the most effective. However, there is still a debate which of them is more effective. Therefore, we decided to continue the research on interdental cleaning in the patients with different conditions of periodontal tissues.

**Aim of the study:** The aim of this project was to determine which method of interdental area cleaning is more effective in removal dental plaque, regardless patient's periodontal condition, sex and age.

**Method:** Thirty-four patients were enrolled into the study. The inclusion criteria were: age over 18 years old, approximal plaque index (API) > 25%, presence of at least 10 contact points between teeth, a history of lack of regular interproximal cleaning. All patients were randomly assigned to two research groups: 16 patients to a group using dental floss (DF), 18 patients to a group using interdental brushes (IB). For each patient, four indices were measured: approximal plaque index (API), full-mouth plaque score (FMPS), bleeding on probing (BOP), papillary bleeding index (PBI), and oral hygiene instructions were performed. During three-month follow-up, patients brushed their teeth two times a day and used interdental brushes or dental floss once a day. Once a month patients were examined for periodontal indices. The results of each group were statistically compared. The approval of the Ethical Committee of Medical University of Lodz was obtained for the study (RNN/381/19/KE).

**Results:** In the DF group, API values were statistically significantly decreased during control visits compared to the baseline. The mean values of API between the subsequent control visits were not statistically significantly different. The mean values of other indices (PCR, BOP, PBI) were also not statistically significantly different. In the IB group, similarly to the DF group, API values were statistically significantly decreased during control visits compared to the baseline. Moreover, a statistically significant decrease of API was found between the subsequent control visits with exception of visits 2-3, as well as FMPS was statistically significantly decreased between 0-1 and 0-3 visits, and BOP was statistically significantly decreased between 0-3 and 2-3 visits. When the DF group and the IB group were compared at four time points, a statistically significant decrease of PBI was detected during 3rd control visit. Other parameters were not significantly different.

**Conclusions:** Both described methods caused significant decrease of API which makes both methods effective in interdental plaque removal. However, the use of interdental brushes resulted in better improvement of periodontal indices and resolution of gingival papilla inflammation in comparison to the dental floss.

## Immediate Implantation In Rehabilitation Of Patients With Localized Periodontitis

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**Presenting author:** Porovai Olesia

**Tutor:** Prof Dobrovolska O., Prof Dobrovolskiy O.,

**Introduction:** Optimization of the rehabilitation protocol for patients with localized periodontitis with the conditions of using the technique of direct dental implantation, which significantly increases the effectiveness of treatment and makes the treatment outcome more predictable and prognosticated.

**Material and methods:** The material for this scientific work was an interesting clinical case of immediate implantation with subsequent prosthetics in a patient with chronic localized periodontitis in the frontal area of the mandible. The clinical study was performed according to generally accepted methods. Clinical examination data were entered into the dental patient's examination card. Resorptive-destructive processes in periapical tissues were studied by using computed tomography. Assessment of oral hygiene was determined with plaque index (PI) (Silness, Løe, 1964). The quality of implant integration and the condition of the alveolar bone were assessed by CT, the degree of stability of the implants was determined using an Osstell instrument.

**Results:** Under local anesthesia (Sol. Ubistesini 4% forte), four teeth were removed in the frontal area in the minimal traumatic way, followed by curettage of the alveolar socket to remove all existing granulation tissue. Because the implants had to be maximally adapted to the bone wall of the alveolar socket, the bone defect around the implants was filled with an autograft formed by mixing a clot of autoplasm enriched with growth factors with the patient's own bone obtained during bone formation. The implants had good primary stability, so we immediately installed temporary abutments and sealed the wound. Impressions were taken with alginate mass. The finished temporary orthopedic structure was fixed the next day. Six months after using the temporary denture, it was replaced with a permanent structure - a metal-ceramic bridge with cement fixation. The condition of the mucous membrane around the implant was assessed visually, by the presence and depth of the peri-implant slit. The intensity of mucositis in the implantation site was studied with using the Schiller-Pisarev test. Tests were performed on day 10, the 1st, the 3rd and the 6th months after implant installation. The stability of the implants was determined after 1 month, 3 months and after six months. During the first month after implant placement, there was a decrease in stability in the bone-implant connection from  $70.35 \pm 0.5$  to  $66.38 \pm 0.5$ . Then begins to increase the stability of the implant, in the third and sixth months after surgery ( $68.01 \pm 0.5$  and  $72.82 \pm 0.49$ ), respectively, which confirms the presence of remodeling of bone tissue around the implants.

**Conclusions:** developed a protocol for orthopedic rehabilitation with the installation of implants immediately after tooth extraction into bone tissue with a weakened periodontium.

## **Examination of the level of pain and comfort of patients undergoing anesthesia using TheWand™ system**

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**Presenting author:** Marcelina Koteluk

**Tutor:** MD PhD, Barbara Krzywiecka, Prof. Urszula Kaczmarek

**Introduction:** Dental anxiety is being reported as one of the common reasons for skipping dental appointments. It is a result of fear of pain during dental procedures. Pain management is one of the most challenging aspects of dental procedure. Successful pain reduce during local anesthesia and dental procedures can affect in stress and anxiety decrease. To diminution of both fear and pain, practitioners can use modern technologies, such as The Wand™ which is computer-controlled local anesthesia application system. It allows application of local anesthesia with controlled speed and under a certain pressure, which reduce unpleasant feelings both during the injection and application of fluid.

**Aim of study:** The aim of this study was to examine clinical appropriability of The Wand™ application system, considering patient's comfort during treatment in conservative dentistry and endodontics. During the survey answerers were also asked to decide which type of anesthesia would they preferred on the next dental appointment.

**Matrial and methods:** The research was conducted within 37 patients of Department of Conservative Dentistry with Endodontics on Wroclaw Medical University. All were anaesthetized using TheWand™ by one dental practitioner. Their sensations were evaluated with Modified Dental Anxiety Scale (MSAD) to determine the level of anxiety and Visual Analogue Scale (VAS) to evaluate pain during dental procedure.

**Results:** With growth of dental anxiety, pain sensation is increased. A vast majority of answerers determined the pain as mild during the injection (78%), application (75%) and dental procedure (89%). Patients, who felt lower pain level, are more willing to choose TheWand™ on the next dental appointment. Twice as many answerers are willing to choose computer-controlled anesthesia by next dental procedure.

**Conclusion:** The Wand™ has achieved satisfactory clinical results. It seems that computer-controlled anesthesia can be good alternative to conventional-applied local anesthesia. It is reported that the Wand can be used to reduce fear and pain among dental patients.



## Efficiency Of Different Sedation Methods In Extraction Of Third Molars

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**Presenting author:** Gaile Bardijevskyte

**Introduction:** Third molar extraction is a common procedure in dentistry and it is usually performed under sedation. The aim of this work is to do a systemic analysis based on reviewed articles related to the selected topic. Moreover, to find out the main methods of sedation used during extractions, indications, medications and its dosage, possible side effects.

**Material And Methods:** Systematic review was performed based on PRISMA guidelines. PubMed/ Medline, Willey Online Library databases were used for the search of articles. All selected studies were published between January 1, 2015 and January 1, 2020.

**Results:** There were found 33 articles related to the selected topic. After applying inclusion/exclusion criteria 17 publications enrolled in this systematic review. Intravenous sedation is performed if patients suffer from serious anxiety and dental phobia or bilateral or more than two ipsilateral third molars are being removed. Midazolam has anxiolytic, sedative and amnesic properties and can be used in combination with opioids. Midazolam can also induce oral and general sedation.

**Conclusions:** Intravenous sedation was the main method used during extraction of third molars. This sedation method is indicated if bilateral or more than two ipsilateral third molars are being removed or patients suffer from serious anxiety and dental phobia. The smaller dose of medication is needed to induce intravenous sedation. It also provides better effect of sedatives. Midazolam was the most often used drug to perform a sedation. The most effective dosage of midazolam intravenous administration- 4.1mg. Nausea and vomiting were the side effects that most frequently appeared after sedation.

## Dental hygiene status in 10-12 years-old adolescents in Vilnius region

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**Presenting author:** Ieva Skiparytė

**Tutor:** prof. Lina Dziaugytė-Eyberdiyev

**Aims of the study:** To evaluate oral hygiene (OH) status in 10-12 years-old adolescents. Find out predictors of oral self-care practice (reflecting OH performed daily) and skills (the ability to perform good OH). Compare OH status in different surfaces of teeth.

**Material and methods:** The study included 250 children aged 10-12 from 6 randomly chosen schools from Vilnius (Lithuania) region. Dental plaque was disclosed using 0.4 percent water-based fuchsine solution. Intraoral photographs of teeth were taken using digital camera prior to brushing teeth (to measure oral self-care practice) and after (to measure oral self-care skills). Oral hygiene was evaluated using Quantitative Plaque Percentage Index. Plaque index was calculated using Adobe Photoshop CC 2015. Statistical analysis was performed using the IBM SPSSv.23 software, descriptive statistics, independent and paired sample t-test, Pearson's correlation were applied. Statistical significance level was set at 5 percent ( $p < 0.05$ ).

**Results:** A statistically significant difference was found between oral self-care practice ( $34.7 \pm 11.1$ ) and oral self-care skills ( $23.4 \pm 8.9$ ) ( $p < 0.05$ ). There is a strong correlation between self-care practice and oral self-care skills ( $r = 0.856$ ). Youngest group of children (10-year-olds) had more dental plaque than other adolescents ( $p = 0.034$ ). Adolescents from small towns showed better OH compared to adolescents from the city ( $p = 0.01$ ). There was no difference in OH between girls and boys. In both oral self-care practice and oral self-care skills teeth in the left side were cleaned better than the right side ( $p < 0.001$ ), as well as the posterior teeth were cleaned better than anterior teeth ( $p < 0.001$ ). Teeth in the upper jaw had less dental plaque than in the lower jaw ( $p = 0.02$ ).

**Conclusion:** Oral hygiene is poor in 10-12 years old adolescents from Vilnius region. Oral self-care practice and skills strongly correlate showing - the better the skills, the better is the daily practice. There were significant differences of dental plaque levels in different surface of teeth, as well in different locations of the mouth. The age and location of residency of adolescent had a significant impact on OH status however the gender does not.

## **The influence of Covid-19 pandemic on the stress level among dental students**

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**Tutors:** Jolanta Loster, Aneta Wieczorek

**Introduction:** Dental students were observed to be an extremely stressed group of young people long before the outbreak of the COVID-19 pandemic. Since the beginning of the pandemic, this problem has significantly intensified. New risk factor (risk of infection of SARS-CoV-2) need to be taken under consideration. Students in higher years deal with stress arising from patients and the associated risk of infection. The inability of students in this time to work with patients, and the consequent lack of training of their manual and soft skills, make them feel insecure about their competence. The pandemic has changed not only their educational pathway. Students started to concern about the health of their relatives, which significantly increases the level of stress.

**Aim of the study:** The aim of this study was to determine whether, and in what way, the COVID-19 pandemic has increased the stress level.

**Material and methods :** The survey was carried out in winter exam session 2021 on 330 Polish students at Dental Program, Jagiellonian University Medical College. Two questionnaires were used: Dental Environmental Stress questionnaire (DES) and Perceived Stress Scale (PSS-10). The research was approved by the bioethics committee. The results were assessed with statistical analysis software.

**Results:** A total of 251 students agreed to take part in the research. The survey revealed an extremely high stress level among dental students. Students worried mainly about the health of their family members and the correctness of the choice of the career path.

**Conclusions:** During the COVID-19 pandemic, the levels of stress experienced during dental education significantly increased.

## **Radiographic changes associated with impacted third molars**

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Vilnius University, Lithuania

**Presenting author:** Agne Lukosiute

**Tutor:** PhD Ruta Rasteniene

**Aim of the study:** To assess the prevalence of pathologies associated with impacted third molars and their position.

**Materials and methods:** Retrospective analysis of 1250 panoramic radiographs was performed. All radiographs of patients aged 18 to 44 were analysed during one year period at Vilnius University hospital Zalgiris clinic. Radiographic lesions around third molars and/or adjacent tooth structures were inspected. The inclination of the impacted wisdom teeth was measured according to Winter's classification. Statistical analysis was carried out using the IBM SPSS Statistics V26.0 software. Descriptive statistics and Pearson's chi-squared test were performed and the threshold for significance was set at  $p < 0.001$ .

**Results:** A total of 2691 impacted third molars of which 1685 were lower and 1006 upper were included into the study. The most common upper third molars position was vertical (38.6%) and mesioangular (44.3 %) in lower third molars. The prevalence of pathologies, associated with impacted third molars, was 15.1%, of which 4.0% were tooth hard tissue lesions, 9.7% periodontal pathology and 1.4% cystic changes, tumors and additional teeth. The most prevalent pathology was bone loss of an adjacent tooth, less than one third of its root length (7.9%), followed by caries or resorption of adjacent tooth distal coronal area (1.5%). A significant connection between patients' age, a lower jaw, a tooth position and structural lesions, as well as between patients' age, a lower jaw and periodontal lesions ( $p < 0.001$ ) was found.

**Conclusion:** A total of 15.1% of impacted third molars were associated with pathologies. The age group of 30 and above, mesioangular impaction of lower third molars was the predominant factor associated with pathologies.

## **Correlation between the classification of malocclusion according to Angle and the position of the cervical vertebrae in the cephalometric evaluation according to Langlade**

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**Tutor:** DDS PhD Aneta Wieczorek, PT PhD Małgorzata Kulesa-Mrowiecka

**Introduction:** Viscerocranium and cervical spine are contiguous structures, morphologically and functionally related, that exhibit interdependence with growth patterns. Research suggests that there may be a correlation between the position of the cervical spine and malocclusion in Angle's classification.

**Aim of the study :**The aim of the study was to find the association between malocclusion based on Angle's classification and measurement of the position of the cervical vertebrae according to Langlade.

**Materials and Methods:** The study was a retrospective analysis of the data collected in 2011-2013 (study no. NN403589138 - the group of 260 young adults, volunteers from Poland, 17-19 years old, both sexes). The evaluation of the inclination of the cervical spine was performed using the AutoCAD program, on 37 lateral cephalometric radiographs selected from the aforementioned database fulfilling the inclusion criteria. The angles between C1 vertebrae and the Frankfurt plane (C1: FH) and also between vertebrae C1 and C4 (C1: C4) were assessed. Whereas malocclusions were assessed by analysis of diagnostic models. Data were analyzed and statistics were calculated with MS Excel. The study group consisted of 17 cases with class II- malocclusion (distocclusion), 76% (n=13) of them were women. There was 20 cases with I Angle's class in the control group of which 65% (n=13) were women.

**Results:** The average angle C1:FH size measurement in cases with II Angle's class was 13% lower compared to the control group (I class). The average angle C1: C4 size measurement in cases with II Angle's class was 15% lower compared to people with I Angle's class. The standard deviation of the C1:C4 angle size was 3.58 larger in people with II class than in the group with I class. The mean of the measurement of percentage difference from the standard for C1:FH angles' size was 10.59 percentage points higher in the study group – comparing to the control group.

**Conclusion:** Based on the analysis of the studied material, it was confirmed that in cases with II Angle's class (distocclusion) there might occur some irregularities in the position of the cervical spine (the reduction of cervical lordosis).

Cephalometric analysis, analysis of cervical vertebrae according to Langlade, Angle's class, cervical spine.

### **COVID-19 pandemic: Impact on children's oral health.**

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**Presenting author:** Alicja Morawska

**Tutor:** DDS PhD Natalia Torlińska-Walkowiak, DDS PhD Justyna Opydo-Szymaczek

**Introduction:** The COVID-19 pandemic has had a considerable impact on human health, causing lifestyle changes, through social distancing and isolation at home, with socio-economic implications. Schools have been closed to prevent the virus spread; therefore, children remain confined in homes, disrupting their daily routine.

**Aim of the study:** The aim of this study was to assess the influence of the SARS-CoV-2 pandemic on primary school children's oral health.

**Materials and methods:** The study comprised of 59 girls and 47 boys aged 6 to 10, attending public primary schools in the city of Poznań. In the survey study, 106 parents answered an online questionnaire divided into three sections regarding dietary choices and habits, oral hygiene behaviours and attitude towards dental appointments.

**Results:** Of those who claimed changes in eating habits, the majority declared they were choosing healthy foods more frequently, whereas highly processed foods less often. 35,8% of parents observed their children were snacking more than before the lockdown. According to the respondents, 16% of children were brushing their teeth not as regularly as they were before the pandemic, whilst only 4,7% more often. None of the surveyed noticed enhancement of children's motivation to maintain good oral hygiene. 28,3% declared a lower frequency of dental visits since the pandemic outbreak.

**Conclusions:** Despite paying attention to the quality of food, many improper behaviours occurred, such as snacking and avoiding brushing. Irregular dental attendance is not followed by higher motivation to maintain good oral hygiene. Findings from this study indicate that the COVID-19 pandemic has some impact on oral health and may lead to an increase in caries risk in children."

## **DERMATOLOGY**

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## Prevalence of dermatological symptoms in patients with tuberous sclerosis complex.

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**Tutors:** MD PhD Agnieszka Tarasewicz, Prof. Alicja Maria Dębska-Ślizień

**Introduction:** Tuberous sclerosis complex (TSC) is a rare genetic disorder affecting many organs. Epilepsy, accompanied by structural brain abnormalities is the most common symptom in childhood. In adult TSC patients renal manifestations are related to significant morbidity and mortality. While diagnosis of TSC is based on clinical diagnostic criteria (major and minor) dermatological symptoms constitute important, easily accessible features and include facial angiofibromas, hypomelanotic macules, ungual fibromas, Shagreen patches and “confetti” skin lesions.

**Aim of the study:** Aim of the study was to determine the prevalence of dermatological symptoms in adult TSC patients.

**Materials and Methods:** In a cross-sectional study we analyzed 49 TSC patients (25 F, 24 M) at the mean age of  $31.47 \pm 10.71$  years admitted to academic reference center.

Based on the patient interview, past medical history and thorough physical examination, dermatological manifestations were studied.

**Results :** Among major diagnostic criteria, 32 individuals (65.31%) presented with three or more hypomelanotic macules of at least 5-mm diameter. Three or more angiofibromas have each been found in 44 patients (89.8%) whereas two or more ungual fibromas in 29 individuals(59.20%). Shagreen patches have been identified in 28 individuals (57.14%).

Minor clinical diagnostic criteria of TSC include confetti skin patches, which 25 patients (51.02%) presented with.

**Conclusions:** Facial angiofibromas are the most common major clinical diagnostic criterion, affecting almost 90% of patients. Each of the dermatological criteria is present in at least 50% of patients. That proves the high prevalence of dermatological symptoms among TSC patients. Due to variable clinical presentation the disease can go undiagnosed. Therefore it is crucial to educate dermatologists not only in the management of skin-related TSC manifestations, but also in diagnosis of the disease. Furthermore, interdisciplinary medical care provided by family doctors, dermatologists and internists appears to be crucial and proves once again the importance of holistic approach to the patient.



## Identification of GP Referral Patterns in which Malignant Melanomas were Referred as Non-Urgent

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**Introduction:** Cutaneous malignant melanoma is the deadliest form of skin cancer, thus early detection and prompt referral is pivotal to improve prognosis. A recent audit has revealed that ~50% of GPs refer melanomas as “Routine” as opposed to “Urgent Suspected Cancers” (USC), potentially resulting in late management. We aimed to identify reasons why GPs are discouraged from using the USC referral route for clinically obvious melanomas. The aim of this study was therefore: 1) to identify common reasons why GPs are discouraged from using the USC referral route for clinically obvious melanoma, 2) to emphasize the importance of making accurate referrals and, 3) to offer recommendations on how to develop a high index of suspicion for melanoma in primary care.

**Methods:** Analysis of all “routine” referrals sent by GPs through Teledermatology between August 2017 and July 2018 was carried out using the Welsh Clinical Portal. Questionnaires were sent to these GPs for enquiry.

**Results:** 42% of melanomas (n=120) were referred routinely by GPs. From the 15 GP responses received, the consensus was that because referrals are reviewed, and if needed, re-prioritised within two days by a Consultant Dermatologist, the referral priority (Routine, Urgent or USC) chosen is given minimal consideration. Additionally, some GPs lacked the confidence to suspect malignancy in difficult-to-identify lesions (especially nodular melanomas). Overall, using the routine channel has no effect on the outcome of the referral as both referral routes are given equal priority. Malfunctions in the referral system, however, have resulted in a referral backlog thus forcing USC referrals to be reviewed as priority. Consequently, routine referrals were reviewed twenty days later than usual, potentially delaying urgent management.

**Implications:** Discovering and addressing common reasons why GPs are likely to refer melanomas non-urgently and helping educate them about the different melanoma subtypes is necessary to guarantee undelayed management in secondary care. Various recommendations are suggested to help facilitate this including organizing regular teaching sessions for GPs by Dermatologists where concerns can be addressed.

## How does wearing a face mask affect the skin?

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**Presenting author:** Kasper Rolek

**Introduction:** The CoViD-19 pandemic has really changed our daily life and one of the elements of the new reality are face masks. There are many types of masks from reusable cotton ones to FFP3 masks which ensure remarkable safety. Undeniably, the protection provided by masks is crucial to slowing a spreading pandemic but we cannot ignore the side effects which may occur.

**Aim of study:** Finding out how common the adverse effects of wearing face masks are. Investigating how side effects manifest and what can increase or decrease their occurrence.

**Method:** Survey was carried out on a group of 595 respondents. The research tool was a questionnaire in the Google Forms and it was carried out online. Participation was voluntary and anonymous.<sup>[1]</sup>

**Results:** Surprisingly, more than 82% of respondents noticed the deterioration of their skin while wearing the face masks. Almost 75% complained of new acne lesions, 41% spotted excessive sweating and redness of the skin, 32% had seborrhoea, 20% had hyperkeratosis, 10% experienced itching. Skin changes on the chin occurred in 72% of respondents. 55% had skin lesions on cheeks, 50% on mandibular angles, 18% on the nose and only 10% report none of them. Among the respondents, 55% wear reusable cotton masks, 41% use disposable surgical face masks and 4% wear FFP2 or FFP3 masks. Less than 40% of respondents who use reusable cotton masks declare washing them daily. 69% of study participants wear masks 1 to 4 hours a day, 41% change their masks less than once a day changes their mask less than once a day. In the survey, 46% of respondents reveal that they put on makeup on skin covered with a mask, 52% did not increase the frequency of washing their facial skin during the pandemic.

**Conclusions:** On the basis of the results, it can be seen that wearing a face mask have multiple adverse effects on skin such as new acne lesions, excessive sweating, redness of the skin, seborrhoea, hyperkeratosis, itchiness. The chin is the most common location of skin lesions that appear during the SARS-CoV-2 pandemic, further locations are cheeks, mandibular angles, and nose. What is more, a significant amount of respondents use reusable masks and admit that they wash them less than once a day. Summarizing, the masks for sure increased the amount of skin lesions on the face that we experience but they are not the only irritating factors. It is important to choose the right type of mask for ourselves, which irritates the skin the least.

## **The analysis of the systemic isotretinoin fear in patients with acne vulgaris**

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**Tutors:** Prof. Magdalena Trzeciak

**Introduction:** Acne vulgaris is exceedingly prevalent skin disease. It may be severe and connected with the risk of permanent scars. Systemic isotretinoin is the most effective drug used in the treatment of this dermatosis. It is considered to be safe when used under a supervision of an experienced doctor. Although it continues to have controversies surrounding it and some of them seem to arise from disinformation.

**Aim of the study:** The primary aim of the study was to estimate patients' opinion on systemic isotretinoin in the treatment of acne vulgaris.

**Material and methods:** 608 responders completed an anonymous online survey created via google forms. 575 of the repliers were woman and 33 were man. The average age was 21,98 years. Questionnaire was divided into 3 sections concerning the demographics, course of acne and systemic isotretinoin therapy. 582 data subjects who declared suffering from acne vulgaris were included in the study.

**Results:** 56% of the responders declared that they are not afraid of systemic isotretinoin therapy. 37,5% of the participants experienced fear of such treatment and 6,4% could not specify. Among them 89,8% of the repliers pointed to adverse effects as a cause of their anxiety related to systemic isotretinoin therapy. The negative impact to the liver, mental disorders, myalgia and arthralgia were typed most commonly. Moreover 78,5% of the responders indicated to the risk of relapse after the therapy with isotretinoin as a source of their concerns. The most frequently (85,9%) the knowledge about systemic isotretinoin came from dermatologist however only 49% of the responders declared that their concerns decreased after visiting a doctor. Moreover 75% of the repliers claimed that they use the internet for gaining informations about isotretinoin therapy.

**Conclusions:** The study shows that the fear of systemic isotretinoin affects a significant part of patients with acne vulgaris. The vast majority of them are afraid of it's adverse effects and consider a dermatologist as a source of informations about this therapy. Although almost a half of patients only had decreased anxiety level after dermatological consultation, therefore a need for a better patient-doctor communication should be taken under consideration.

## Syphilis epidemiology at the Department of Dermatology in 2015-2020

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**Tutors:** Prof. Aleksandra Lesiak

**Introduction:** Syphilis is a sexually transmitted infection caused by *Treponema pallidum*. Disease may occur as acquired or congenital. The incidence of syphilis has increased in the last few years.

**Aim of the study:** The aim of the study was to analyze hospitalization of patients with syphilis.

**Method:** A retrospective analysis of medical records from 2015-2020 was performed. The study group consisted of patients (including female and male) who were admitted to the Department of Dermatology. Patient data were analyzed for age, gender, length of stay, medical diagnosis (ICD-10), non-treponemal test (VDRL,RPR), treponemal-specific tests (TPHA,FTA,FTA-ABS) treatment and comorbid diseases.

**Results:** During the study period, there were 425 hospitalizations (2015-38,2016-39,2017-50,2018-58,2019-107,2020-133). 302 in men and 123 in women. Of 425 patients 227 (53,4%) were rehospitalized. The average age of patients was 32,1 years. The youngest patient had 8 days and the oldest had 72 years old. The average length of stay was 2,2 days. The most of hospitalizations were one-day stays (69,5%). 34,1% patients presented with concomitant diseases. The most common comorbidities were HIV (20,7%), complications during pregnancy-syphilis during pregnancy (15,1%), psoriasis (2,1%), hepatitis B (1,9%) and hepatitis C (1,2%). 96,9% of hospitalization were related to drugs administration and among the treatments the most common was benzathine penicillin (77%). Syphilis, unspecified accounts for almost half of the diagnosis (47.1%), the second most frequent diagnosis is early syphilis, unspecified (25.4%) and the third is late syphilis, unspecified (11.5%). Among hospitalizations, most often patients had no symptoms, macular rash accounted for 9% and ulcerations for 5.6%.

**Conclusions:** The number of syphilis - related hospitalization increased significantly between 2015 and 2020. The above analysis illustrates that syphilis remains a public health problem. Lack of knowledge about STI and poor sex education in schools are most likely reasons for these results.

## Medical comorbidities in lichen planopilaris

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**Tutors:** MD PhD Anna Waśkiel-Burnat

**Introduction:** Lichen planopilaris is an autoimmune form of lymphocytic primary cicatricial alopecia. The pathogenesis of the disease is not fully elucidated. To date, only a few studies assessed medical comorbidities in patients with lichen planopilaris.

**Aim of the study:** To identify the prevalence of medical comorbidities in patients with lichen planopilaris.

**Methods:** The medical records of 100 women diagnosed with lichen planopilaris (50 women with classic lichen planopilaris and 50 women with frontal fibrosing alopecia) were retrospectively reviewed for existing comorbidities. The control group consisted of 50 women with actinic keratosis.

**Results:** In women with lichen planopilaris hypertension and hypothyroidism were the most common comorbidities with the incidence rate 45% (45/100) and 34% (34/100), respectively. Dyslipidemia and arrhythmia were observed in 16% (16/100) and 10% (10/100) of patients with lichen planopilaris. Less commonly, diabetes mellitus type 2, asthma and osteoporosis were detected (6%, 6/100; 4%, 4/100; 4%, 4/100 respectively). Comparing to the control group in patients with lichen planopilaris hypothyroidism was more often observed- 34% (34/100) vs. 16% (8/50). Hypertension, dyslipidemia and arrhythmia were negatively correlated with lichen planopilaris and occurred more likely in women with actinic keratosis (45%, 45/100; 16%, 16/100; 10%, 10/100 vs. 72%, 36/50; 30%, 15/50; 24%, 12/50). No significant differences were observed in the frequency of medical comorbidities between women with classic lichen planopilaris and frontal fibrosing alopecia.

**Conclusions:** Hypertension and hypothyroidism are the most common comorbidities in women with lichen planopilaris. Moreover, hypothyroidism occurs with the higher incidence in patients with lichen planopilaris. However, they were less likely to have hypertension, dyslipidemia and arrhythmia. Further studies are suggested to evaluate the impact of medical comorbidities on lichen planopilaris.

**Does the effectiveness of biological medications in the treatment of psoriasis depend on the moment of starting therapy? – a preliminary study.**

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**Tutors:** Prof. Aleksandra Lesiak

**Background:** It is well known that biological medications are highly effective in psoriasis treatment. They act on selected elements of the immune response, leading to resolving of the psoriatic skin lesions more efficiently compared to conventional systemic treatment.

**Aim of the study:** Our working hypothesis was that patients starting biological therapy in winter and summer had a different response to the treatment.

**Material and methods:** Eighty-six patients (31 women and 55 men) with psoriasis vulgaris fulfilling the criteria for biological treatment were recruited to the study. Outcome of psoriasis treatment was assessed by changes of the following scores of psoriasis severity: Psoriasis Area and Severity Index (PASI), Body Surface Area (BSA), and Dermatology Life Quality Index (DLQI). The scores were recorded at the beginning of therapy, after 1 month, 4 and 7 months. All patients were divided into two groups, those beginning the treatment in the cold period of the year (November-March) and in the warm period (May-September). A different response to the treatment in these groups was analysed using standard statistical tests for the differences between samples (Wilcoxon rank-sum and Kolmogorov-Smirnov tests). Patients' laboratory blood tests results recorded at each monitoring stage were also compared for any relationship to the achieved outcomes.

**Results:** The median of relative PASI changes was of ~40% (with PASI 75=14%) and 60% (PASI 75=27%) after 1-month therapy, for patients starting the therapy in winter and summer, respectively. Such an improvement was also found for other scores for psoriasis activity (BSA, DLQI). All the differences were statistically significant. Those differences became statistically insignificant at the end of the observational period of 7 months, i.e. the median was of 87% (PASI 75 ~ 85%) and 92% (PASI 75 ~ 82%) for the winter and summer group, respectively. Changes in selected laboratory blood tests were trendless at any monitoring stage.

**Conclusions:** A clear sign of seasonality appeared in the effectiveness of the biological medications therapy of psoriasis with a better outcome in patients starting treatment during warm period of the year. Those differences are becoming statistically insignificant at seven months of treatment.

## **Epidemiological profile of different types of psoriasis in the Department of Dermatology throughout 2019-2020s.**

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**Tutors:** Prof. Aleksandra Lesiak

**Introduction:** Psoriasis is one of the most common chronic inflammatory diseases, which mostly affects skin and joints. Many patients suffer from psoriasis worldwide and it is reported that the prevalence varies among different ethnic groups. Both genetic and environmental factors play an important role in pathogenesis of this illness. Although our knowledge about psoriasis has expanded during the last several years, there are still many unknowns for scientists.

**Aim of the study:** The aim of the study was to analyse medical records in order to assess clinical characteristics patterns of psoriasis patients at the dermatology department in the years 2019-2020.

**Material and methods:** The study was based on a retrospective analysis of the medical records of psoriasis patients who were admitted to the dermatological ward in the provincial hospital in Lodz between 2019 and 2020. The study group consisted of patients diagnosed with different types of psoriasis. Patients' data were analysed for age, gender, medical diagnosis (ICD-10), treatment, clinical course of illness, severity indexes (PASI, BSA, DLQI) and results of the diagnostic tests such as complete blood count, various cholesterol fractions and blood sugar level.

**Results:** In the years 2019-2020 572 patients with different types of psoriasis were admitted to the dermatological department. The number of female and male patients were quite similar: 306 males (53,5%) and 266 females (46,5%). This research also included 49 children, which accounted for 8,6%. Mean age among admitted patients was 44,6 years. Vast majority of patients were diagnosed with psoriasis vulgaris - 449 (78,5%). Second most common diagnosis was arthropathic psoriasis-190 (33,2%). Only 28 (4,9%) were admitted because of palmoplantar pustular psoriasis and 10 (1,8%) because of generalized pustular psoriasis. Among them about 18% of patients had both psoriasis vulgaris and arthropathic psoriasis. Various comorbidities like hypertension, asthma, depression or diabetes were reported in 227 patients (39,6%). Moreover, the research revealed plenty of abnormalities in blood tests such as high AST(9,6%), ALT(18,4%), CRP(19,6%) serum level and blood sugar level (12,5%).

**Conclusions:** It is essential to remember that psoriasis is a systemic disease and affects not only skin and joints. The results of the research revealed various abnormalities in blood tests, as well as many different comorbidities in psoriasis patients. The adequate cooperation between specialists from different fields and patients is crucial.

The analysis of the medical record of psoriasis patients allows us to better understand the clinical course of this disease and to assess the best way of treatment to ease the symptoms and improve quality of life in psoriasis patients'.

## **Antibiotic-related adverse drug reactions in patients treated on the dermatology ward of Medical University of Gdańsk**

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**Tutors:** Prof. Wioletta Barańska Rybak, MD PhD Dorota Mehrholz

**Introduction:** Adverse drug reactions (ADR) are unexpected reactions to a medication administered in a correct way at a standard dose. Drug- induced skin reactions account for 60-70% of all ADR. Among the most common culprits are antibiotics, especially beta lactams.

**Aim of the study:** Aim of the study was to determine the prevalence of antibiotic related dermatological adverse drug reactions in patients treated in the department of Dermatology, Venerology and Allergology of the University Clinical Center in Gdańsk, Poland in the course of 15 years.

**Materials and methods:** Retrospective analysis of medical files of 287 patients experiencing dermatological adverse drug reactions was conducted in order to identify cases connected with the use of antibiotics.

**Results:** Out of 287 cases, 80 were linked to the use of antibiotics. The most common group of antibiotics were beta lactams, causing drug induced skin reactions in 44 patients. Beta lactam antibiotics in our study included amoxicillin, alone and combined with clavulanic acid, and cephalosporins, affecting 20, 17 and 7 patients, respectively. Another significant group in our research were lincosamides, being the culprit in 18 cases. 5 cases of dermatological ADR after tetracyclines were identified. Folic acid antagonists affected 4 patients and macrolides, including claritromycin, azithromycin and spiramycin, 3 patients. Only two cases each were linked to fluoroquinolones and metronidazole. Vancomycin and Rifampin were associated with the smallest amount of cases, each affecting only one patient in our study.

**Conclusions:** Beta lactam antibiotics showed the highest prevalence among antibiotic-induced skin reactions. They accounted for 15% of cases of all dermatological drug reactions and 55% of those caused by antibiotics. Especially amoxicillin, prescribed as single drug or in combination with clavulanic acid, can be the culprit. Due to its wide use in the hospital as well as in the outpatient clinic, these adverse reactions have to be beared in mind by both, hospital staff and general practitioners.



**The epidemiological analysis of children treated for vascular malformations throughout 2012-2019s in the department of paediatric dermatology.**

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**Tutors:** Prof. Aleksandra Lesiak, MD PhD Aleksandra Kobusiewicz

**Introduction:** Port-wine stain (PWS) is a congenital vascular malformation that occurs in 3:1000 newborns. It usually grows in proportion to the growth of the child and persists throughout life. It can appear on any part of the body as light pink to purple discolorations with well defined borders. A spontaneous involution is rarely observed. When PWS is left untreated, it may possibly darken or become hypertrophic. Pulsed dye laser (PDL) is the treatment of choice for PWS.

**Aim of the study:** The aim of the study was to present epidemiological analysis of children treated for PWS with PDL in the department of paediatric dermatology.

**Materials and Methods:** The 144 patients with PWS under 18 years of age, treated with PDL, were enrolled in the study. Data was collected based on hospital medical records of the dermatological ward in the provincial hospital in Lodz, from 2012 to 2019 and statistically analysed.

**Results:** Of 144 patients, females constituted 74.3% of the population and males 25.7%. Mean age was 10.04 years. There were 73 patients with identified locations of vascular malformation of which the most common location was: lower limb (43.84%) and face (42.47%). Lesions were less frequently localized on the upper limb (17.81%), back (13.7%) or neck (10.96%). 72.6% of patients presented lesions in one location and 27.4% in more than one location - 2 locations (16.44%), 3 locations (6.85%), 4 and more locations (4.11%). From 2012 to 2019, 604 procedures of treatment with PDL were performed. The average parameters of laser were dependent on localization of the lesion and were set as follows (the average of: the energy [J/cm<sup>2</sup>], the pulse duration [ms], the spot diameter [mm]): face (9.11/0.64/7), lower limb (8.15/1.46/7.78), neck (8.38/1.33/7.82), upper limb (8.57/1.39/7.55).

**Conclusion:** The majority of patients presented lesions in one location. The most common locations were the lower limb and face. The parameters of the PDL differed depending on the localization of lesions. The great demand for laser treatment was observed from 2012 to 2019.

## Tattoos in polish population - prevalence and demographics

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**Tutors:** MD PhD Aleksandra Batycka-Baran

**Introduction :** Tattoos have become very popular worldwide in the recent years.

**Aim of study:** Aim of the study was to deepen the knowledge about this type of body art in a socio-demographic context which can result in better health care provision in the future.

**Materials and Methods:** This was a cross-sectional online survey, conducted on a representative sample of individuals from Poland (n=4809). 3805 (79,1%) participants were females and 1004 (20,9%) were males. The online survey was conducted with using self-created questionnaire consisted of 25 questions.

**Results:** 881 (18,3%) respondents have one tattoo, 3484 (28,1%) tattoos are situated on forearms and palms and 2270 (17,5%) tattoos have plant motif. 2586 (20,6%) subjects admitted that they made a tattoo to express their personality. 4739 (98,5%) respondents do not regret making a tattoo in the past. 956 (19,9%) respondents are concerned about a part of their body which they consider to be unattractive, then they determined how this problem affects their social, work and other important areas of life: 456 (47,7%) subjects admitted that their problem disturbs them in their social life. 190 (9,9%) people admitted that their tattoo aims to distract attention from their problem.

**Conclusions:** Understanding the motivations of getting a tattoo helps to gain information about individuals. In our survey most subjects did it to express their personality, strengthen their self-esteem and to demonstrate their feelings and emotions. Almost one fifth of respondents have problems with acceptance of some parts of their body. Tattoos help in some cases to improve perception of the appearance of their body by distracting attention from the real problem.

## **Episodic acute urticaria with suggestive history of allergic rhinitis: proved idiopathic anxiety**

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**Presenting author:** Ayesha Shaikh

**Tutors:** MD PhD Bashir Patel,

**Introduction:** Urticaria is a transient erythematous swelling of the skin also known as Hives or weals. It is An Allergic Skin Rash whose Appearance is noted anywhere on the body, including the face, lips, tongue, throat, or ears; In Accordance Allergic rhinitis is a symptomatic condition of the nose caused by allergen exposure and IgE-mediated inflammation with association of urticaria as an allergic disease that has a major negative impact on patients' quality of life besides anxiety leading to an outbreak, which then conducts to more stress.

**Purpose:** To scrutinize the suffering of patients of urticaria and it is the clinical history which is most important; to identify potential causes; however, urticaria is very often idiopathic. Patients suffering from urticaria may be a symptom of a serious underlying medical illness or the allergic symptoms may progress to cause systemic reactions, and it is important to identify these patients and to remember that severe urticaria is a distressing and disabling condition.

**Methods & Materials:** A consecutive solitary study in laboratorial analysis on CBC, CRP, ESR were done. While taking in consideration of other systemic reaction an autologous serum skin test was done to know whether it was an auto reactive urticaria. Closed ball point pen tip test was done. Antibodies assay was done. C1 esterase inhibitor test or C1-INH test was done crucially. A retrospective analysis of laboratory, histopathology and direct immunofluorescence data of 93 patients with acute urticaria. For histopathological analysis, cell count was performed in four fields at high magnification ( $\times 400$ ). The resulting cell count medians were submitted to statistical analysis and, then, were correlated to laboratorial findings. Past history of patient was taken in consideration

**Result:** C1 esterase enzyme deficiency was noted. Out of 93 patients; 75 patients had c1 esterase deficiency with Urticaria, rest 18 were with angioedema without urticaria which is associated with B cell Lympho-proliferation disorders in some patients. Typically Hay-fever (allergic rhinitis) triggers Watery Coryza, mild swelling around the eyes, rigors; generating episodic acute urticaria. On cohort investigation relevant history of known case of Allergic rhinitis, Hypersensitivity to many medicines & anxiety were known. A significant association between increased total IgE and urticaria severity was found.

**Conclusions:** We found a female predominance (76.34%) of episodic urticaria cases, and an average age of 42.5 years (SD  $\pm$  15). Hereditary angioedema has an incidence of approximately 1 in 50000 individuals. C-reactive protein correlated with urticaria activity ( $P < .001$ ), quality of life impairment ( $P = .026$ ), and inflammatory and coagulation markers ( $P < .001$ ). Elevated levels of CRP are common and relevant in EAU patients. The assessment of CRP levels may help to optimize the management of patients with EAU.

## **DIABETOLOGY AND ENDOCRINOLOGY**

### **COORDINATORS:**

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## **Glycemic control impact on the development of depression among patients with diabetes mellitus**

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**Introduction:** The rigors of managing diabetes mellitus (DM) can be stressful and lead to psychological disorders. Depression is common among patients with DM and, statistically, is often undiagnosed. In order to solve the problem, International Diabetes Federation recommends encouraging screening for depression in primary care diabetes clinics. In the present study, we aimed to assess the risk of depression development among patients with DM and determine whether screening for psychological disorders should be implemented into diabetes care management.

**The aim of the study:** To evaluate the glycemic control influence on the psychological status of patients with DM and to assess the risk of depression development. Determine whether patients with DM should be screened for psychological disorders.

**Materials and methods:** Patients with both T1DM and T2DM were analyzed (n=100), mean age  $59.3 \pm 11.2$ , mean duration of diabetes –  $9.2 \pm 5.9$ , male/female ratio 54%/46% (54/46). (T1DM – 13% (n=13), T2DM – 87% (n=87). The following tests were used to assess the psychological status of the patients: 1) Patient health questionnaire – 2 (PHQ-2); 2) The Minnesota Multiphasic Personality Inventory (MMPI); 3) SF-36 to evaluate the health-related quality of life (HRQoL).

**Results:** According to the PHQ-2 results, 21 patients have high risk of depression development (85-92.9%), 50 patient – moderate risk (48-81.2%) and 29 patients – low risk (<36.9%). The patients with the high risk of depression developing have the mean level of HbA1c (NGSP, %)  $11.3 \pm 2$ ; patients with the moderate and low risk have the mean level of HbA1c –  $8.4 \pm 1$  and  $7.2 \pm 1.3$  accordingly. There were no significant associations between age, sex, diabetes types, duration of diabetes and the results of PHQ-2 ( $p > 0.05$ ). High risk of depression development is associated with lower level of HRQoL. MMPI results show that bad glycemic control is associated with astheno-neurotic type of personality ( $p < 0.05$ ); patients with good glycemic control show better results of psychological adjustment, compared to patients with the bad one ( $p < 0.05$ ).

**Conclusions:** There is a tight connection between diabetes and the increased risk of depression. Considering diabetes and depression are highly prevalent chronic conditions that have significant impact on health outcomes, patients should be screened for psychological disorders. Bad glycemic control definitely can be a risk factor in depression developing, therefore the management of diabetes should include psychological aspects to improve the psychological well-being and health-related quality of life.

## **Improvement of comorbidities of obesity after bariatric surgery**

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**Introduction:** Bariatric surgery is an effective method of treatment of obesity and the comorbidities. The typical comorbidities include arterial hypertension (AH) and type II diabetes mellitus (DM2).

**Aim of the study:** The purpose of study is to evaluate the outcomes of bariatric surgery with emphasis on improvement of comorbidities.

**Materials and methods:** A total of 392 patients underwent sleeve gastrectomy in the Department of General, Minimally Invasive and Elderly Surgery in Olsztyn in 2013-2018 according to standard technique. Patients were surveyed during personal or telephone consultations. The analysis included improvement of AH and DM2 in two years after surgery.

**Research results:** The follow up rate was 62,24%. Among the patients, 103 had AH and 46 DM2. After the surgery 53,40% of patients had total remission of AH, 30,10% improved and 16,50% had no change. Among patients with DM2 63,04% had total remission, 32,61% improved and 4,35% had no change.

**Conclusion:** Bariatric surgery is a good method of treatment of comorbidities of obesity. The majority of patients have total remission or improve AH or DM2 after the surgery in a short follow-up period.

## **The influence of recombinant human thyroid stimulating hormone (rhTSH) on the efficacy of radioiodine therapy in patients with toxic nodular goitre with low RAIU**

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**Presenting author:** Joanna Rucińska

**Tutor:** MD PhD Saeid Abdelrazek

**The aim of our study** was to evaluate the influence of rhTSH on the efficacy of radioiodine therapy (RIT) in patients with toxic nodular goitre (TNG) with low RAIU.

**Materials and methods:** The study was performed on 30 patients with TNG (22 female and 8 male aged 45–78 years) referred for <sup>131</sup>I therapy. All patients had low RAIU (16–18%) 24 hours after a diagnostic dose of I-131 (4 MBq). All the patients received a single intramuscular dose of 0.05 mg rhTSH (thyrogen). 24 h later diagnostic dose of <sup>131</sup>I was administered and thyroid scan with RAIU after 24 and 48 h was estimated. Therapeutic dose of <sup>131</sup>I was given on the third day of rhTSH administration. Serum levels of TSH, fT4 and fT3 were determined, 24 h, 72 h after rhTSH administration and on the 3rd day after RIT. The therapeutic activity of <sup>131</sup>I calculated by Marinelli's formula and ranged between 280 and 600 MBq. The absorbed dose ranged between 160 and 300 Gy. Follow up control was done every 6 weeks. Thyroid ultrasound, and thyroid scan were done again after 12 months of RIT

**Results:** A significant increase (2–8 fold) in 24hr RAIU was observed after rhTSH administration. The distribution of radioiodine was more homogeneous 48 hours after rhTSH injection. After 12 months 93% of patient were in euthyroidism and 7% (2 patients) develop hypothyroidism. After six months the mean reduction in goitre volume was 20% and 45–50% after twelve months. The medium therapeutic activity of <sup>131</sup>I was 280 MBq.

**Conclusions:** Pre-treatment with rhTSH reduce the therapeutic dose of <sup>131</sup>I by 50–58% without compromising the result of thyroid volume reduction. rhTSH makes RIT of TNG more effective in the patients with low RAIU.

**Declaration of interest:** The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research project.

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**Assessment of the prevalence of thyroid autoantibodies: thyroid peroxidase antibodies (ATPO) and thyroglobulin antibodies (ATG) in children with newly diagnosed diabetes mellitus type 1 (T1D) in years 2016-2019 in the Upper Silesia region, Poland**

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**Introduction:** T1D is often associated with other autoimmune diseases, particularly autoimmune thyroiditis (AIT). It is also proven that the prevalence of thyroid antibodies at the time of diagnosis of diabetes is higher than in the population without T1D.

**Aim of the study:** The aim of our study was to evaluate the prevalence of thyroid antibodies: ATPO, ATG and their association with the selected clinical parameters in children with newly diagnosed T1D.

**Material and methods:** The retrospective study, based on hospital records from last four years (2016-2019) included 737 children (401 males) with newly diagnosed T1D, the median age - 9.69 (25%-75% 6.15-12.92) years. The analysis of prevalence ATPO, ATG was performed in three age groups: 0-5, 5-10, 10-18 years. Analysed parameters included: anthropometric data, glutamic acid decarboxylase antibodies (GADA), tyrosine phosphatase IA2 antibodies (IA2A), zinc-transporter 8 antibodies (ZnT8A), HbA1c, C-peptide, daily insulin dose, thyroid hormones: TSH, fT4, presence of diabetic ketoacidosis.

**Results:** Positive ATPO and/or ATG were found in 10.6% among all children with newly diagnosed T1D: ATPO-9.4%, ATG-4.3%, ATPO and ATG (both)- 3.1% with no significant differences in the prevalence between assess years. Positive ATPO were found in: 12.3% - 10-18; 9.1% - 5-10; 4.0% - 0-5 years, and positive ATG were confirmed in: 5.7% -10-18; 4.7%- 5-10; <1% - 0-5 years in respective age groups. Positive ATPO were significantly more frequent in older children (Me 10.81 vs. Me 9.47 years;  $p=0.005$ ), as well as positive ATG (Me 11.47 vs. Me 9.59 years;  $p=0.040$ ). Positive ATPO were observed more often in girls (63.8% vs 36.2%;  $p=0.002$ ). Moreover, in the analysis of selected clinical parameters, statistical significance was found as follows: positive ATPO coexisted significantly more often with positive and higher GADA (86.8% vs. 13.2%;  $p=0.008$ ; Me 186.93 vs. 48.69 U/ml;  $p=0.001$ ), in children with respectively positive ATPO and ATG, were observed higher level of HbA1c (Me 12.2 vs. 11.5%;  $p=0.039$ ; Me 12.4 vs. 11.06%;  $p=0.039$ ) and higher TSH (Me 3.43 vs. Me 2.89 mIU/l;  $p= 0.008$ ; Me 3.88 vs. Me 2.92 mIU/l;  $p=0.010$ ).

**Conclusions:** Positive thyroid antibodies were found in approximately 11% of the pediatric population in Poland with newly diagnosed T1D, especially in older children, female, and with positive GADA.



## **Association between nocturnal hypoxia and DM2 among OSA patients**

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**Tutors:** MD PhD Agata Gabryelska, MD PhD Marcin Sochal, Prof. Piotr Białasiewicz

**Introduction:** Diabetes mellitus type 2 (DM2) is a common comorbidity in obstructive sleep apnea (OSA). There is still not enough information how to determine individuals at higher risk of DM2 among OSA patients.

**Aim of the study:** To assess the influence of nocturnal oxygen saturation parameters on the onset of diabetes mellitus type 2 (DM2) among obstructive sleep apnea (OSA) patients.

**Material and methods:** The study consisted of 549 participants, who underwent polysomnography (PSG) examination. Based on apnea hypopnea index (AHI) 465 patients were diagnosed with OSA, 107 individuals had been diagnosed with DM2. Cox regression models were used to assess the effect of oxygen saturation parameters on the onset of DM2. Classification and regression trees (CART) analysis was used to assess the onset of the DM2 in the study group in context of oxygen saturation variables.

**Results:** One-way Cox regression showed higher risk of earlier DM2 for increased values of BMI ( $p < 0.001$ , 95%CI 1.083-1.153, HR=1.117), AHI ( $p = 0.003$ , 95%CI 1.004-1.017, HR=1.011), decreased basal O<sub>2</sub> ( $p = 0.006$ , 95%CI 0.886 - 0.9809, HR=0.933) and O<sub>2</sub> nadir ( $p = 0.009$ , 95%CI 0.972-0.996 HR=0.984) value, while lowered mean O<sub>2</sub> desaturation has not shown statistical significance. In the CART analysis following cut-off points 92.2%, 81.7%, 87.1% were determined for basal O<sub>2</sub>, O<sub>2</sub> nadir and mean O<sub>2</sub> desaturation respectively with first 2 parameters being statistically significant.

**Conclusions:** Higher SpO<sub>2</sub> nadir and basal SpO<sub>2</sub> are associated with the later onset of DM2 in OSA patients. Basal O<sub>2</sub> is independent from AHI, BMI and age predictor of DM2 among OSA patients.

## **GlyCulator 3.0: An updated online platform for the analysis of glycemic variability based on Continuous Glucose Monitoring records**

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**Tutors:** Prof. Wojciech Fendler, Prof. Agnieszka Szadkowska

**Introduction:** Continuous Glucose Monitoring (CGM) systems became widely popular for clinical assessment in diabetes within the last years. An increasing number of studies, including clinical trials, demanded standardization of computation of glycemic variability (GV) indices. Joint efforts of the diabetes community resulted in the unification of standards for the clinical usage and interpretation of CGM. Furthermore, CGM, incorporated into many national and international care standards, has become a gold standard of clinical assessment in diabetes.

**Aims of the study:** The study aims to provide a free online platform that allows for reliable and replicable CGM analysis and GV computation, with the continuous support of current CGM analysis standards.

**Material and methods:** The programming software was based on a database system optimized for the storage of time series data. Platform incorporated automated reading and pre-processing of raw CGM data files, computation of GV indices, time range selection and cross-sectional analyses. Calculation of GV and quality control was based on the current standards, as published in “Standards of Medical Care in Diabetes”, Diabetes Care 2018-2021. Access to analysis options and results was provided via a user-friendly graphical user interface (GUI) and application programming interface (API). The latter can be used for crosstalk with external applications for further analysis of CGM data. The platform has been tested using 400 patient-years of anonymized CGM data from four providers (Abbott, Dexcom, Eversense, Medtronic). Data has been collected from the consenting patients treated in the Department of Pediatrics, Diabetology, Endocrinology and Nephrology, Medical University of Lodz, Poland.

**Results:** The update on the online platform “GlyCulator” provides a modular implementation of current CGM analysis standards. Modules included are: automated data import, selection of date ranges, quality control and missing-values imputation, GV computation, cross-sectional analysis and generation of analysis reports. Platform GUI and API have been tested on 400 patient-years of CGM, providing correct results with no processing error. After the analysis, the “GlyCulator” user can upload CGM data, including a short description of the study protocol and define the access options (open, restricted) to be stored within the encrypted projects’ repository. After providing a URL link and password, data, stored information on the project can be accessed, i.e. by the reviewer, principal investigator or clinical trial monitor.

**Conclusions:** The updated “GlyCulator 3.0” platform provides an online easy-to-use CGM data analysis service. Open access to stored data and settings used for analysis will increase the replicability of published CGM studies.

**Comparison of clinical and metabolic characteristics, and pregnancy outcomes in women with gestational diabetes mellitus depending on the moment of diagnosis**

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**Tutors:** MD PhD Klaudia Czarnik, Prof. Katarzyna Cypryk; MD PhD Monika Żurawska-Kilś

**Introduction:** Gestational Diabetes Mellitus (GDM) is associated with higher incidence of adverse pregnancy outcomes. Nowadays GDM is being diagnosed more frequently in the first half of pregnancy. However, until now the causes of this phenomenon have not yet been established.

**Aim:** The aim of the study was to compare the clinical and metabolic characteristics, as well as pregnancy outcomes in women with GDM depending on the moment of diagnosis.

**Methods:** A retrospective cohort study was conducted on 393 pregnant women with GDM, treated between 2014 and 2020. In 85 patients GDM was diagnosed before the end of 20th week of pregnancy (group A), and in 308 GDM was diagnosed after 20th gestational week (group B). The clinical and metabolic characteristics of the subjects, as well as pregnancy outcomes were analyzed.

**Results:** The women in both groups did not differ in terms of the age, mean BMI, frequency of BMI categories ( $\leq 25\text{kg/m}^2$ ,  $25\text{-}30\text{kg/m}^2$ ,  $>30\text{kg/m}^2$ ), glucose concentrations in 75gOGTT or frequency of insulin therapy (all  $p>0.05$ ). No differences were observed as concerns the duration of pregnancy, percentage of preterm deliveries, mode of delivery, neonatal birth weight or the incidence of excessive birth weight. In the newborns in group A, compared to group B, significantly higher incidence of the Small for Gestational Age (SGA) was observed (16.47% vs 8.44%;  $p=0.0302$ ). Comparative analysis of the infants with SGA with those without SGA (with mean birth weight 2650g (2250-2800) vs. 3400g (3150-3650), respectively;  $p<0.00001$ ) showed that in the group of offspring with SGA, the mothers were diagnosed with GDM significantly more frequently before the end of the 20th week of gestation ( $p=0.0302$ ). There were no differences in the remaining parameters. A negative correlation was observed between the occurrence of SGA and the time of GDM diagnosis ( $p=0.0258$ ), and a positive correlation between the presence of SGA and the diagnosis of GDM before the end of the 20th gestational week ( $p=0.0302$ ). In the logistic regression models, corrected for maternal age and prepregnancy BMI, the moment of GDM diagnosis, 75gOGTT glucose concentrations, treatment regimen, and gestational age at delivery, only diagnosis of GDM before the 20th week of gestation was an independent predictor of neonatal SGA (OR greater than 2 for all analyzed models,  $p<0.05$ ).

**Conclusions:** Women with GDM, regardless of the moment of GDM diagnosis, did not differ in terms of clinical characteristics, GDM diagnostic tests results, or the mode of treatment. In women with GDM diagnosed before the end of the 20th gestational week the prevalence of SGA in the newborns is higher compared to the subjects with GDM diagnosed after the 20th week of pregnancy. The moment of GDM diagnosis has no effect on other pregnancy outcomes. Further research is needed to explore the cause of the observed phenomenon. "

## **The efficacy of radioiodine therapy in patients with non-toxic nodular goitre with large cold nodule**

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**Presenting author:** Paula Mantiuk

**Tutors:** MD PhD Saeid Abdelrazek, Prof. Janusz Myśliwiec

**Aim of the study:** Most of the patients with the benign cold nodule refuse surgical operation. Radioiodine therapy (RIT) is an excellent choice for these patients. The aim of our study was assessment of the efficacy of radioiodine therapy to reduce thyroid volume in patients with cold nodules by the use of two doses of radioiodine.

**Methods:** We treated 40 patients with non-toxic nodular goitre with large cold nodule, aged 18 and 48 years; initial 24 h radioiodine uptake (RAIU) was ranged between 18–45%, and thyroid volume ranged between 48 and 120 ml, effective half-life was more than 3 days at the time of treatment. Malignant changes were excluded in all nodules by fine needle aspiration biopsy. The activity dose was calculated by the use of Marinelli's formula and ranged between 280 and 800 MBq. Thyroid ultrasonography, and thyroid scan with RAIU at 24 was done before and after 6 and 12 months of RIT. Follow up control was done every 6 weeks.

**Results:** After 6 months RIT in all the patients the large cold nodule changed to hot nodule. In 13 patients the size of the thyroid gland decreased to 48% and no need for the second dose of radioiodine therapy. 27 patients received second dose of RIT to decrease the nodule which was cold and turned to hot after the first dose. After 12 months of the second dose of radioiodine a mean thyroid volume reduction of 56% was achieved. After 12 months of RIT euthyroidism persist in 52% of patients, and hypothyroidism develop in 48% of patients.

**Conclusions:** Radioiodine is non-invasive, safe and cost effective method of therapy for reduction of large non-toxic goitre even with cold nodule. It should be used in patients who refused surgical operation or patients with high surgical risk due to comorbidities. The reduction of the cold nodule and the thyroid volume were due to well accurate measurement of administered activity, relatively high effective half-life and well-organised follow up.

## **Assessment Of Metabolic Disturbances In Patients With Pcos And Hypovitaminosis D**

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Medical University of Białystok

**Presenting author:** Agnieszka Wikarek

**Tutor:** MD PhD Piotr Kocełak

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age, characterized by hyperandrogenism and chronic anovulation.

The aim of the present study is to show the association of hypovitaminosis D with metabolic syndrome in women with PCOS.

Our work is a compendium of information with an emphasis on the impact and consequences of low plasma 25-hydroxyvitamin D (25OHD) levels and polycystic ovary syndrome (PCOS).

Evidence is presented to suggest that vitamin D deficiency is common in PCOS and may be associated with metabolic and endocrine dysfunctions such as insulin resistance, hypertension, and atherogenic dyslipidemia.

The development of insulin resistance and diabetes mellitus results from deficiencies in vitamin D, which is essential for proper secretion through regulation of key genes for glucose metabolism.

Chronic 25(OHD) deficiency increases parathormone (PTH) levels in women with PCOS.

Increased levels of oxidative stress markers (ROS) are observed, which correlate with increased symptoms of hyperandrogenism, cell damage, or cell apoptosis. Coexisting hyperglycemia increases the synthesis of ROS in PCOS syndrome. Excessive proliferation of vascular smooth muscle cells, osteogenic processes may lead to vascular calcification, which increases the cardiovascular risk in women with PCOS.

PCOS patients with associated hypovitaminosis D have also been shown to have an increased risk of developing non-alcoholic fatty liver disease (NAFLD) and more rapid development of non-alcoholic hepatitis (NASH). This is due to reduced antiproliferative effects of vitamin D and insulin resistance.

**The influence of a single, very low dose of rhTSH on the efficacy of radioiodine therapy in patients with nontoxic nodular goitre and low radioiodine uptake.**

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**Tutor:** MD PhD Saeid Soleman Abdelrazek

**Aim of the study:** The aim of our study was to evaluate the influence of recombinant human thyroid-stimulating hormone (rhTSH) on the efficacy of radioiodine therapy in patients with non toxic nodular goitre with low RAIU.

**Materials and methods:** The research was conducted on 50 patients with nontoxic nodular goitre (36 females, 14 males, aged 34–75 years). All patients had low RAIU (8–16%), 24h after a diagnostic dose of I-131 (4 MBq). All the patients received a single intramuscular dose of 0.05 mg rhTSH. 24h later diagnostic dose of 131I was administered and thyroid scan with RAIU after 24 and 48 h was estimated. Therapeutic dose of I-131 was given on the third day of rhTSH administration. Serum levels of TSH, fT4 and fT3 were determined, 24 and 72 h after rhTSH administration and on the 3rd day after radioiodine therapy. The therapeutic activity of I-131 ranged between 280-600 MBq, and the absorbed dose between 150-220 Gy. Follow up control was done every 6 weeks. Thyroid ultrasound, and thyroid scan were done again after 6 and 12 months of radioiodine therapy.

**Results:** A significant increase in 24h RAIU was observed after rhTSH administration, also the distribution of radioiodine was more homogeneous 48 h after rhTSH administration. After 12 months 92% of patient were in euthyroid state and 8% develop hypothyroidism. After 6 months the mean reduction in goitre volume was 22 and 45–55% after 12 months. The medium therapeutic activity of I-131 was 280 MBq.

**Conclusions:** Pre-treatment with rhTSH reduce the therapeutic dose of I-131 by 50–58% without compromising the result of thyroid volume reduction. rhTSH makes radioiodine therapy more effective in the patients with nontoxic nodular goitre with low RAIU.

## **Assessment Of Musculoskeletal Disorders In Patients With Thyroid Dysfunction, Diabetes And Obesity**

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How hormonal changes in particular clinical conditions, such as obesity, thyroid disorders or diabetes, affect the patients' motor system. How individual clinical conditions affect bone turnover and metabolism

Our work is a compendium of information about individual metabolic diseases, including their impact on the locomotor system, as well as their consequences. How a positive energy balance affects the osteoblasts and joints of obese patients. There is an interaction between adipose tissue and bone tissue, which is directly influenced by the hormonal function of adipose tissue.

Studies show that receptors for thyroid hormones TR $\alpha$ 1 and TR $\beta$ 1 are found in platelet chondrocytes, bone marrow stem cells, osteoblasts and osteoclasts, and their expression in osteocytes is questionable. Persons with both type 1 and type 2 diabetes (T1DM, T2DM) have a significantly higher risk of bone fractures compared to persons without diabetes. The reason is not the difference in BMD, BMI or falls. It follows that people with diabetes have reduced resistance to bone fractures. Skeletal homeostasis is associated with insulin sensitivity through a nuclear receptor activated by peroxysome proliferators (PPAR) $\gamma$ . The same posttranslational modifications of PPAR $\gamma$  protein, regulating insulin sensitivity and energy metabolism, are responsible for regulating bone turnover, which allows PPAR $\gamma$  to control the differentiation of cellular components of bone remodeling.

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## Trends in incidence and mortality of breast, corpus uteri and ovarian cancers in Poland between 1980 and 2018

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**Aim of the study:** The aim of this study was to determine and analyze the incidence, mortality rates and trends in breast cancer (BC), corpus uteri cancer (CUC) and ovarian cancer (OC) in Poland in 1980-2018.

**Methods:** Data on the incidence and mortality of BC, CUC and OC in 1980-2018 were obtained from the Polish National Cancer Registry. In years 1980-1996 the ninth revision of the International Statistical Classification of Diseases and Related Health Problems (ICD 9) was used, thus cancers were coded as follows: ICD 174 for female BC, ICD 182 for CUC, and ICD 183 for OC. Diagnoses made after 1996 were coded according to the tenth revision of the ICD: C50 for female BC, C54 for CUC and C56 for OC. Regrettably, some pieces of information were not available to research (data for 1981, 1986-1987 and 1997-1998). Age-standardised rates (ASRs) of cancer incidence and mortality were calculated by direct standardisation. Incidence and mortality trends were described with the annual percentage change (APC) calculated by joinpoint regression with 0-2 join points, which was performed in Joinpoint Regression Program, version 4.8.0.1. The symbol "\*" next to the APC indicates  $p < 0.05$ .

**Results:** A significant increase in BC incidence was observed (APC1980-1990 2.29\*, APC1990-1999 4.09\*, APC1999-2018 1.76\*), while mortality in BC was characterized by a small increase, then a decrease, then a re-increase (APC1980-1994 0.61\*, APC1994-2010 -0.82\*, APC2010-2018 0.79\*). In case of CUC incidence, after large increase, the nonsignificant decrease has been observed since 2015 (APC1980-1994 3.67\* APC1994-2015 1.97\* APC2015-2018 -1.74). CUC mortality decreased and then increased at a greater rate (APC1980-2006 -1.14\*, APC2006-2018 3.91\*). In the analyzed period, both the incidence and mortality in OC showed an initial increase followed by a decrease (incidence: APC1980-1993 3.14\*, APC1993-2018 -0.28\*; mortality: APC1908-2007 0.40\*, APC2007-2018 -0.89\*). The analysis of data broken down by age groups reveals that in recent years the death rate from TPL has been decreasing for age groups up to 59 years old, while it is increasing for older age groups (20-24 APC1980-2018 -3.15\*, 25-29 APC1980-2018 -3.50\*, 30-34 APC1988-2018 -3.82\*, 35-39 APC1980-2018 -2.72\*, 40-44 APC1993-2018 -3.01\*, 45-49 APC2014-2018 -8.75\*, 50-54 APC2006-2018 -2.21\*, 55-59 APC1980-2018 -0.14, 60-64 APC1980-2018 0.23\*, 65-69 APC1980-2018 0.91\*, 70-74 APC1980-2018 1.56\*, 75-79 APC2003-2018 1.33\*, 80-84 APC1980-2018 2.72\*, 85+ APC1980-2018 3.30\*). The incidence in OC does not show a similar trend.

**Conclusion:** Since 1980, the incidence of BC has increased at a variable pace, while incidence in OC has decreased since 1993. The COC incidence trend in the last few years is not clear. A reduction in mortality rate was observed for OC since 2007, while for BC and CUC statistically significant increases can be noticed for the last several years.

## **Influence of pelvic floor muscles on urinary incontinence among women.**

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**Tutors:** PhD Katarzyna Wszółek

**Introduction:** Incontinence consists in the uncontrolled urine leakage from the bladder, regardless of the cause. Every woman should take care of the condition of her pelvic floor muscles to prevent the occurrence of incontinence.

**Aim of the study:** Evaluation of the knowledge among women about the pelvic floor muscles and their influence on incontinence incidents.

**Materials and methods:** The study was based on the evaluation of the responses received to the online and paper questionnaires. Our questionnaire collected information on the prevalence of urinary incontinence among women and their knowledge of pelvic floor muscles. The study surveyed among 419 women (46 paper and 373 full-filled online questionnaires).

**Results:** A survey was conducted among women aged 19-70 and indicated that 34.1% respondents struggled with urinary incontinence (almost 46% while coughing, sneezing, exercising, lifting heavy objects or laughing). Surprisingly only 18.1% of women went to the doctor for a consultation due to the problem. Childbirth was undoubtedly a factor affecting the functioning of the pelvic floor muscles. 46.8% of women who gave birth, incidents of urinary incontinence occur. The knowledge among women is still not sufficient. Although 76.4% of the respondents said they knew where the pelvic floor muscles were, but more than 25.3% of them were wrong about its location. As many as 52% of the respondents were still convinced that it was appropriate to exercise the pelvic floor muscles by stopping the flow of urine.

**Conclusions:** Despite the high percentage of women with incontinence incidents, knowledge of pelvic floor muscles is still insufficient. Among women which gave birth, incontinence incidents are more frequent than among women which did not give birth. It is concern that a large percentage of respondents believe that pelvic floor muscles should be trained during urination (by stopping the urine stream). The results indicate that educational programmes for women on pelvic floor muscles should be introduced.

### **Physical activity during pregnancy**

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**Introduction:** Nowadays, a healthy lifestyle gains more and more popularity - pieces of information may be easily obtained in social media and tv programmes. Women try to lead an active life, also while being pregnant. Despite the available sources of information, does the women's knowledge about a physical activity is appropriate?

**Aim of the study:** The point of our research was to assess women's knowledge about indications for a physical activity, types of activities which are allowed and their impact on the course of pregnancy.

**Materials and methods:** The original online questionnaire was distributed to Polish women in January and February 2021. The survey contained questions concerning basic demographic data and physical activity during pregnancy, as well as a test checking the knowledge about the main talking point. An amount of 458 questionnaires was obtained. The data was statistically analysed using the program "Statistica 13".

**Results:** Five age groups: less than 20, 20 to 25, 26 to 30, 31 to 35 and over 35 years of age, contained 2%, 18%, 26%, 20% and 33% of women accordingly. The mean test result was 73% (95% CI 72.2-74.3). 42% of women were pregnant when filling in the survey and they achieved better test results than women who were not pregnant at the time of the survey ( $p < 0.05$ ). Antenatal classes attendance was declared by 25% of those questioned and they had higher test scores than those who did not participate ( $p < 0.05$ ). We observed statistical differences between groups divided by educational background, age, number of children, self-assessment of knowledge of the subject, as well as whether they had an interview about physical activity with gynecologists or not and who the conversation was initiated by ( $p < 0.05$ ). Only 30% of respondents talked with their OBGYN about physical activity during pregnancy. What is interesting, there were no significant differences in test scores between women with different lifestyles, activity level during pregnancy and marital status ( $p > 0.05$ ). We did not observe correlation between test results and time since last birth, weight as well as BMI ( $p > 0.05$ ).

**Conclusions:** The level of education may have an impact on knowledge of the respondents as women who gained a higher level of education are more conscious about the meaning of a regular physical activity and probably can choose the most reliable sources.

There is a need for a better education regarding physical activity during pregnancy and it could be obtained from the antenatal classes and/or the talk with one's gynecologist.

We would like to encourage gynecologists and obstetricians to start a conversation about physical activity during pregnancy with their patients as soon as it is possible - optimally before pregnancy.

## **Gynecological aspects of radical hemato-oncological treatment of women with hematological neoplasms- a questionnaire study**

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**Tutors:** Prof. Lidia Gil, MD Monika Adamska

**Introduction:** Nowadays, the increasing number of cancer survivors after successful oncological treatment due to hemato-oncological malignancies is observed worldwide. Female patients at reproductive age after hemato-oncological treatment (HT) are a special group at high risk of gynecological and obstetric complications.

**Aim of the study:** Defining the occurrence of gynecological and obstetric complications in female patients treated radically due to hemato-oncological malignancies.

**Materials and methods:** Retrospectively analysed group comprised of 63 female patients (age: 18-49 y.o.) from Department of Hematology and Bone Marrow Transplantation, who underwent HT between 2006-2021. Each woman filled in the questionnaire concerning gynecological health state before, during and after HT (78 questions).

**Results:** Analysed group comprised of women, who underwent HT due to: Hodgkin lymphoma - 52%, non-Hodgkin lymphoma - 24%, acute lymphocytic leukemia - 8%, acute myeloid leukemia - 8%, chronic lymphocytic leukemia – 3%, aplastic anaemia – 2% and myelofibrosis - 2% with median age of 33 y.o (SD=8,9). 97% of patients underwent chemotherapy, radiotherapy was implemented in 30% of patients, autologous hematopoietic stem cell transplantation in 16% and allogeneic hematopoietic stem cell transplantation (alloHSCT) in 13%. Main gynecological complications during HT were amenorrhoea (36%), vaginal dryness (24%) and decreased libido (22%). Oral contraception was used by 6/63 women during HT, however 19/63 patients stopped sexual activity during that time. 87% of patients after alloHSCT were diagnosed with premature ovarian insufficiency (POI). Infertility appeared in 13% of all patients after HT. In analysed group 2 women were pregnant during HT, 7 women after HT. One premature delivery and 2 cases of cervical shortening were observed, however all pregnancies ended with live births of healthy newborns.

**Conclusions:** Gynecological complications were observed in majority of patients during HT. Prevention of POI should be taken into consideration while planning HT of young women, especially during decision of alloHSCT application. The cooperation between hematologists and gynecologists remains essential to prevent gynecological complications after HT.

## Investigating Changes in Maternal Haemodynamics During Caesarean Sections using Non-Invasive Cardiac Output Monitoring (NICOM™)

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**Introduction:** During pregnancy, significant cardiovascular changes occur to adapt to maternal and foetal requirements. Stages of Caesarean sections (CS) are associated with cardiovascular risks such as haemorrhage. This underscores the importance of continuously monitoring cardiovascular parameters such as cardiac output (CO), stroke volume (SV), heart rate (HR) and total peripheral resistance (TPR) during Caesarean to detect deviations from norm and guide therapeutic interventions.

**Methods:** This was a prospective longitudinal cohort study undertaken within a four-month period at St George's Hospital. 45 women undergoing elective CS were recruited. Non-Invasive Cardiac Output Monitoring (NICOM™) measured haemodynamic parameters prior to, and during surgery. NICOM™ is a continuous, non-invasive device which shows pulsatile thoracic blood flow through the concept of bioactance. Values for CO, SV, HR and TPR throughout the Caesareans were recorded as mean  $\pm$  standard deviation and analysed using analysis of variance (ANOVA).

**Results:** Baseline (pre-Caesarean) values for CO, HR, TPR and SV were  $6.9 \pm 1.4$  L/min,  $86 \pm 12.4$  bpm,  $1085 \pm 238.7$  dyn·s·cm<sup>-5</sup>,  $80.2 \pm 18.2$  ml/beat, respectively. Upon spinal anaesthesia, HR dropped by 11.6% ( $P \leq 0.01$ ). At uterine incision, HR decreased by 16.3% ( $P \leq 0.0001$ ). At oxytocin administration, CO increased by 27.5% ( $P \leq 0.0001$ ); SV increased by 24.1% ( $P \leq 0.0001$ ); TPR decreased by 29.9% ( $P \leq 0.0001$ ). Data obtained using the NICOM™ machine was concordant with original research using alternative methods of measuring cardiovascular parameters.

**Conclusion:** Results show significant changes in cardiovascular parameters compared to baseline during CS. Establishing baseline values for parameters may allow healthcare professionals to recognise early signs of complications, particularly important in pathological pregnancies. A larger sample size in the future could reduce the margin of error and increase reliability.

## The influence of gestational diabetes and its management on the birth weight and APGAR score

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**Presenting author:** Kinga Racisz

**Tutors:** MD Anna Nowak, PhD Maria Szubert

**Introduction:** Gestational Diabetes Mellitus (GDM) is a glucose tolerance impairment occurring during pregnancy and can result in hyperglycemia. It is one of most common complications during pregnancy and according to epidemiological data, it affects on average in 5,4% of pregnant women. It influences fetuses leading to macrosomia, hyperbilirubinemia and others which usually causes lower APGAR score. There is also higher occurrence of cesarean sections compared to healthy pregnancies. GDM can be managed depending on severity of glucose tolerance impairment either only by diet or by combination of diet and insulin injections.

**Aim of the study:** This study aims to look into the impact of GDM and way of its control on both birth weight and APGAR score of newborns.

**Material and methods:** The research involved a retrospective analysis of clinical information, which was collected at Madurowicz Hospital Center. The case group consisted of women diagnosed with GDM and their newborns. The control group consisted of randomly selected expectant mothers without GDM and their newborns. The same exclusion criteria for this group were used as for the case group. The research covered a group of 249 pregnancies – 99 with GDM and 150 without. The case group of women with GDM was further divided into 2 subgroups: managed through diet and by insulin. Other data included in the demographics contained: maternal age, maternal BMI and delivery method. In their newborns, the birth weight and APGAR readings at 1min and 5min after birth were taken into account.

**Results:** The lowest APGAR1 score at 1 min in the research group equated to 2, whereas in the control group was 6. The lowest APGAR2 score at 5 min was 8 in both groups. Median for APGAR for both groups was 10 after 1 min and 10 after 5 minutes. The mean APGAR1 level was 9.74 in the study group and 9.83 in the control group. The mean level of APGAR 2 was 9.83 in the study group and 9.90 in the control group. The difference between the control and study groups is not statistically significant:  $p=.9055$  for APGAR 1 and  $p=.6191$  for APGAR 2. The average APGAR1 was 9,74 for babies of patients with GDM managed by diet and 9,72 for those managed by insulin. The average APGAR 2 score was 9,83 for babies of patients with GDM managed by diet and 9,83 for the ones controlled via insulin. There was a negligible statistical difference between both groups ( $p=0,9021$  for APGAR 1) and ( $p=0,8808$  for APGAR 2).

**Conclusions:** Well-controlled gestational diabetes, regardless of the method of control, does not result in lower APGAR score. This may mean that well-controlled gestational diabetes does not lead to significant changes in the mother's body that could adversely affect the fetus."

## **What do you really know about HPV? - Study of knowledge about the HPV virus among the medical students.**

Krystian Blok, Dorota Kowalik, Klaudia Kożuchowska

Medical University of Łódź

**Presenting author:** Krystian Blok

**Tutors:** MD PhD Maria Szubert, MD Anna Nowak

**Introduction:** HPV is the most common sexually transmitted virus. In some cases, the HPV infection persists and results in either warts or precancerous lesions. These lesions increase the risk of cancer of cervix, vulva, vagina, penis, anus, mouth, tonsils or throat. HPV infection can be prevented by vaccination. The most recommended vaccine against HPV is the nine-valent vaccine (Gardasil-9), which is active against the greatest number of HPV variants.

**Aim of the study:** Awareness of the danger of HPV in public spaces is still insufficient. Some people know HPV causes cervical cancer, but unfortunately this is often the only thing known.

Medical students is a group of people which should possess the basic medical information, including knowledge about HPV. They will make future patients aware of medical issues. The society pays attention to whether doctors, who encourage vaccination vaccinate themselves.

Therefore, our research team checked the knowledge about HPV and HPV vaccination among the medical students in Poland. We checked also, how many future doctors are vaccinated against HPV.

We treat a group of Polish students as a reference point for a broader analysis of knowledge about HPV. The collected information may help in conducting other research related to the subject of gynaecology, infectious diseases or vaccinations. Conclusions can help improve the level of medical education.

**Method:** Using an electronic, anonymous questionnaire, we checked the knowledge and level of vaccination of medical students. The test part of questionnaire was multiple-choice, which made it possible to better check the level of knowledge. The questionnaires were shared on Facebook groups of medical students. We also sent it to as many representatives as possible. They published the questionnaire on the Facebook page of their yearbook. After completing the survey, the result was automatically sent to the Gmail box.

**Results:** We have analyzed 275 results until now. The average test score was 8,23 out of 17 points. 53,26% were below average and 46,54% were above average. The unvaccinated students scored higher (average test score was 8,43) than vaccinated students (average test score was 7,64). Females had a higher score (average test score was 8,33) than males (average test score was 7,89). Students who have never taken part in gynecology classes had lower results than students who attended (part-time or full-time classes). Students achieve higher scores proportionally to the higher year of study (average lowest results for 1st year, average highest results for 6th year). More detailed analyses about various aspects of the survey are still being conducted.

**Conclusions:** Student's knowledge is broad, but not complete. Gynecology classes cause positive, but insufficient effect on the education of future doctors. "

## **Women's perception of sexuality in pregnancy and postpartum**

Anna Lipka, Aleksandra Gładych

Poznan Medical University

**Presenting author:** Anna Lipka

Tutors: MD PhD Emilia Gąsiorowska, Katarzyna Kawka-Paciorkowska

**Aim of the study:** The aim of our work was to examine factors affecting sexual satisfaction during pregnancy and after birth - focusing mainly on physical and professional activity, sense of attractiveness and proper preparation for delivery.

**Method:** An anonymous questionnaire regarding last pregnancy was distributed online among 155 female respondents. Standard descriptive statistics were used in analysis.

**Results:** Women aged 26 to 35 were inquired and for 92,9% it was either first or second childbirth in their lifetime. 60% of pregnancies ended with natural birth, while 36,1% required cesarean section. Level of self-perceived attractiveness before pregnancy was high, however, there was a decreasing tendency postpartum. The frequency of sexual intercourses declined, even though 45,2% of women declared increased libido, especially during second trimester. 59,4% of respondents wasn't active physically during pregnancy and 34,2% did not pursue professional activity. More than 36% of women did not prepare to the labour at all and 67,9% had episiotomy procedure performed. Almost 1/3 of respondents was not informed when it is safe to begin sexual intercourses again and over 2/3 considered the first intimate contact after giving birth as a great concern. Pain, weight gain, self-sense of unattractiveness and shame were the most common factors indicated by women.

**Conclusions:** Sexual activity during pregnancy declines and such state remains even postpartum. Most of the women have great concerns about resumption of intercourse. It is affected by factors such as level of knowledge or sense attractiveness. This survey shows crucial role of education regarding sexuality among pregnant women. Key to success is communication between obstetrician or midwife and a patient, thus informing her about safe sexual activity during and after birth.



## How can the diagnosis of growth restriction be improved?

Dominik Jakubowski

Pomeranian Medical University

**Presenting author:** Dominik Jakubowski

Tutors: MD PhD Sebastian Kwiatkowski

**Aim of the study:** The objective of the study was to compare the tools used for assessing neonatal birth weight. Three growth charts used by Polish clinical practitioners (INTERGROWTH-21st, Fenton, WHO) were compared.

**Method:** A retrospective assessment of 9,235 singleton births delivered between 2015 and 2019 in the Clinical Department of Obstetrics and Gynecology, Pomeranian Medical University in Szczecin was made. The inclusion criteria included singleton pregnancy and gestational age at birth ranging between 24 and 40 weeks. Pregnancies terminated prior to 24 weeks' gestation and after 40 weeks' gestation (627 records), as well as multiple pregnancies, were excluded. The obtained data were divided into 5 groups depending on gestational age at birth: A – between 24 and 27, B – between 28 and 31, C – between 32 and 35, D – between 36 and 37, and E – between 38 and 40 weeks. Subsequently, gestational age and neonatal birth weight were mapped on three growth charts. Next, the LMS method was used to calculate the 10th, 90th percentiles for the 40th week for males and females, respectively. The percentages of the population meeting the criteria for SGA defined as a birth weight below the 10th percentile and LGA defined as birth weight above the 90th percentile were determined. The Kolmogorov-Smirnov test was used to establish whether the data demonstrated normal distribution, followed by the Kruskal-Wallis test. All missing values were marked as NA. Statistical significance was accepted for p values of <0.05.

**Results:** The analysis showed that for female children born at 40 weeks' gestation, the 95th percentile for birth weight was 4,200 g, the 90th percentile was 4,030 g, and the 10th and 5th percentiles were 2,970 g and 2,840 g. It was shown for male newborns born at 40 weeks' gestation that the 95th percentile for birth weight corresponded to 4,230 g, the 90th percentile to 4,120 g, and the 5th percentile to 2,920 g. Our analysis of the gathered data showed statistically significant differences in gravidity and parity values and pregnancy termination methods between the groups.

**Conclusions:** The results obtained in our study confirm the hypothesis that there are discrepancies in the assessment of birth weight depending on the growth chart used. In addition, it has been proven that the percentage of children qualified for either the SGA or the LGA group varies significantly depending on the methodology used.

## Why do Polish Women choose hormonal contraception? - a Cross-Sectional Study

Karolina Gasz, Karolina Czarnecka  
Medical University of Warsaw

**Presenting author:** Karolina Gasz

**Tutors:** MD PhD Monika Grymowicz

**Introduction:** The hormonal contraception is not only used as an effective pregnancy prevention but also as a treatment for many conditions. The latest data from the Central Statistical Office showed a shift in contraceptive methods choice in the population of Polish women. A steady increase in contraceptive prevalence, usage of condoms and hormonal contraception has been observed.

**Aim of the study:** The aim of this study was to investigate which type of hormonal contraceptives prevails, which factors affect the choice and whether sociodemographic, health care characteristics and current COVID-19 pandemic have an impact on it.

**Material and methods:** A cross-sectional survey was conducted among 1009 Polish women, aged 15-69, past and current hormonal contraceptive users. An anonymous and voluntary questionnaire, containing 16 multiple-choice and close-ended questions, was distributed online on Facebook in February 2021. Surveyed women were divided into two groups: the birth control group and the other indication group. Descriptive statistics and logistic regressions analysis were used. Categorical variables were compared using the chi-squared test.

**Results:** Of 1009 women involved in the study, 774 women were currently using hormonal contraception and 235 previously used to. The most common indications for taking hormonal contraception were respectively: birth control, dysmenorrhea, irregular menstruation, acne and heavy menstrual bleeding. One-third of respondents who were taking oral contraceptives as a form of a birth control, were also using condoms as an additional form of contraception. Only 8% of participants stated that COVID-19 had an impact on their decision regarding usage of hormonal contraceptives. Regardless of an indication, the prevailing form of hormonal contraception was combined oral contraceptive pill and doctor was considered as a preferred source of information about contraception. The main reason for discontinuation was side effects. Birth control group and other indication group do not differ in terms of age ( $p=0,32$ ), income ( $p=0,40$ ), education ( $p=0,38$ ) and having children ( $p=0,08$ ) but differ in place of residence ( $p=0.03$ ). Women in the birth control group less often suffered from chronic illness (OR 0.64 [95% CI: 0.43-0.96],  $p=0.03$ ) and declared to be single (OR 0.35 [95% CI: 0.22-0.56],  $p=0.00$ ). They also less often declared not to have sex (OR 0.07 [95% CI: 0.03-0.14],  $p=0.00$ ) or have sex less than couple times a month (OR 0.22 [95% CI: 0.11-0.44],  $p=0.00$ ).

**Conclusions:** Hormonal contraception, especially in the form of combined oral contraceptive pill is widely used by Polish women as a form of birth control and as a treatment of numerous gynecological conditions. Women using hormonal contraceptives as a form of birth control are more likely to be in relationship, not suffer from a chronic illness and have sex at least couple times a month.

## **The effect of lifestyle on ovarian cancer occurrence among Polish population**

Gazala Abdulaziz, Natalia Welc

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**Presenting author:** Gazala Abdulaziz

**Tutors:** MD PhD Emilia Gąsiorowska

**Aim of the study:** Ovarian cancer is the most lethal gynaecological cancer, being the 4th leading cause of death among women in Poland from malignancies. Due to the lack of successful screening and asymptomatic or nondistinctive manifestations at the beginning, the diagnosis is often made when the cancer is advanced (FIGO stage III or IV), which results in a low survival rate. Given that lifestyle risk factors have been associated with the development of malignancies, its impact on ovarian cancer should be evaluated focusing on the Polish population. Assessing of how lifestyle risk factors affect the probability of developing ovarian cancer among Polish women is necessary in order to raise awareness and encourage women to modify their unhealthy behaviours.

**Material and methods:** Surveys were collected from 45 patients suffering from ovarian cancer admitted to the Department of Gynaecologic Oncology. Questionnaires included questions about height and weight, lifestyle prior to diagnosis, including: profession, sedentary work, work shifts at night, the amount of physical activity per week, type 2 diabetes and metformin usage, smoking, alcohol drinking, sleep disorders, stress and the use of antidepressants. The collected data was used for statistical analysis and compared with the results from previously published scientific papers about the risk factors of ovarian cancer.

**Results:** Based on the obtained data on weight and height, the body mass index was calculated. 50.0% of patients had BMI above 25 and 15.2% had BMI over 30. 41.3% of interviewees reported having sedentary work and 26.1% reported both sedentary work and lack of any physical activity. 6.5% of patients had type 2 diabetes and 6.5% took metformin. 39.1% of patients admitted to smoking cigarettes, with the mean value of pack-year being 10.9. Sleeping problems were present in 30.4% of interviewees. 49% of patients with advanced cancer (FIGO stage III or IV) reported sleeping less than the median value of 7 hours. In case of patients with FIGO stage IV, the median value was only 5,5 hours of sleep per day. 19.6% of patients admitted to having night shifts. The presence of stress, most often family or work-related, was reported in 43.5% of patients. 15.2% of interviewees admitted taking antidepressants.

**Conclusions:** Surprisingly, even though half of the patients had BMI above 25, very few were diagnosed with type 2 diabetes and were using metformin, which is known to have a protective effect on malignancies. Excess weight is a risk factor that can be altered. It is, therefore, important to motivate patients to lose weight by exercising and having a proper diet and, also, to prescribe metformin. On the other hand, stress, both family and work-related, is a very important risk factor that, unfortunately, cannot be easily altered. It often results in sleep disorders, smoking and sometimes even in depression and the use of antidepressants. Further research is needed as education and promotion of healthy lifestyle can reduce the occurrence of ovarian cancer and prevent many deaths.

## Polish medical students' awareness<sup>[L]</sup><sub>[SEP]</sub> about reproductive physiology

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**Presenting author:** Karolina Zgodzińska

**Tutors:** Ewa Ślizień-Kuczapska

**Introduction:** Falling fertility rates and prevalence of infertility become serious problems of public health that affect people all over the world. Even though some of these issues are inevitable, there are many risk factors that can be reduced if at least basic reproductive health literacy is well known and shared. According to the most recent studies, fertility awareness among people of reproductive age is inadequate. This is why it seems to be so urgent to improve it, especially when we consider future medical staff.

**Aim of the study:** The aim of this study was to examine the Polish medical students' awareness about reproductive physiology.

**Materials and methods:** From March to May 2020, 445 female and 97 male medical students of a mean age 22.3 years participated in the on-line authors' own questionnaire, that reached 13 Polish medical universities. The questionnaire was divided to three sections regarding procreation health. The part analyzed in this study — „Reproductive physiology” — included seven basic questions related to the topic.

**Results:** 92% of the students correctly recognized the first day of female cycle and 88% the correct length of it. Almost every participant (98%) knew the meaning of the term „ovulation”, while 84% properly indicated when it occurs within a cycle. 69% of respondents were aware of the time during which the egg cell is alive and capable of being fertilized, while 51% knew how long sperm retain their ability to fertilize in the reproductive tract of a woman. 93% of the students correctly marked where fertilization occurs. Students who plan to start a family in the future have the overall mean score of 83% correct answers. Statistically lower levels of knowledge about fertility is presented by the students that have no decision about the future family or do not want to raise a family (80% and 72% respectively). The results seem to be similar irrespective of the participants' gender, year of study, sexual activity and potential pregnancy prevention method.

**Conclusions:** The results show that Polish medical students' awareness of basic fertility physiology is on a relatively high level. Students who plan to have children in the future represent better knowledge about fertility physiology than the students that do not want to start a family or have no decision about this yet. The level of literacy does not seem to correlate with gender of participants, year of study, sexual activity and potentially used family planning methods. Nevertheless it is still essential to introduce modern knowledge about fertility care and prophylaxis issues to prevent fecundity problems among future medical staff, so that they will properly take care of their health and educate their patients.

## **Reduction of postoperative analgesic requirement after gynaecological laparoscopy with local ropivacaine analgesia: a randomised, prospective study**

Laura Ivanova, Antons Babuškin

Riga Stradins University, Latvia

**Presenting author:** Laura Ivanova

**Introduction:** Early postoperative pain remain a problem and it can delay functional recovery after surgery. Combination of port-site and intraperitoneal analgesia can reduce pain and improve quality of recovery.

**Aim of the study:** The aim of this study was to compare port-site and intraperitoneal ropivacaine analgesia in reducing pain and analgesic requirement after laparoscopic surgery.

**Materials and Methods:** The prospective randomized study included women undergoing any gynaecological laparoscopy with the time limit of 2 hours, who underwent wound analgesia with 10 ml 0,2% ropivacaine undiluted for port-site and diluted intraperitoneally 10ml 0,2% ropivacaine with 10ml 0,9% normal saline in Latvian Maritime Medicine Centre and were randomized into three groups. Group 1 Pre-incisional (n=22), Group 2 Pre-closure (n=22) and Group 3 Control group (n=17). Pain was assessed using visual analogue scale (VAS) at 2, 6, 12, 24h after surgery. The requirement of rescue analgesics was recorded.

**Results:** A total of 61 patients with mean age 38.00 ( $\pm 10,18$ ) were scheduled for gynaecological laparoscopic surgery. VAS scores after surgery revealed no significant difference between groups. Patient requirement of additional painkillers was lower in both groups receiving analgesia comparing to control group in all periods after surgery.

Pain intensity and rescue analgesia requirement are similar in pre-incisional and pre-closure groups. Significantly fewer patients required painkillers for analgesia in the ropivacaine groups than control group- 2h after surgery ( $p=0.001$ ), 6h after ( $p=0.001$ ), 12h after ( $p=0.154$ ), 24h after ( $p=0.544$ ). 27% of patients in ropivacaine group did not require any additional analgesia at all comparing to Control group ( $p=0,014$ ).

**Conclusions:** Pre-emptive port-site and intraperitoneal anaesthesia is better than no anaesthesia. No difference in time of ropivacaine administration was observed during the study. Combination of pre-emptive port-site plus intraperitoneal ropivacaine to standard postoperative analgesia reduced postoperative additional analgesics requirement in gynaecological laparoscopy.

## **Assessment of the level of women's knowledge about HPV infection and influence on cervical cancer**

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**Presenting author:** Bożena Kmak

**Tutors:** PhD Tomasz Wikarek

**Introduction:** Cervical cancer is one of the most common cancers in women. A link between infection with oncogenic HPV types and the occurrence of cervical cancer has been proven. Proper prophylaxis in the form of regular cytology and HPV genotyping as well as widespread vaccination reduces the incidence of this type of cancer in women.

**Aim of the study:** The purpose of this study is to determine the level of women's knowledge about HPV, its association with cervical cancer and the preventive measures women can take to prevent this cancer.

**Material and methods:** The study group consisted 770 female respondents, mean age  $28.8 \pm 10.45$  years were included. A self-administered questionnaire of 49 questions was used that included questions about sociodemographic data and knowledge of risk factors for HPV infection, its symptoms and consequences, and methods of prevention and detection. Inclusion criteria: female sex, age 18-70 years, accommodation, education, knowledge about HPV.

**Results:** The results of the questionnaire show that despite many educational programs and events aimed at raising awareness about cervical cancer prevention up to 13% of women surveyed have never heard of the human papillomavirus and 34.2% do not know what diseases are caused by HPV infection. There was observed significant correlation between accommodation and regular attendance on gynecologist appointments which was higher among citizens of city over one hundred people ( $p=0,035$ .)

69.72% of women are not aware of the possibility of using a highly sensitive test - HPV genotyping - for cervical cancer prevention. Additionally, 93.48% of the female interviewers have never had or do not know of this test being performed on them. Over 85% of women who are aware of HPV are not vaccinated, 45% of them avow not feeling threatened by the disease as the main reason. Among those who have heard about HPV, 67.7% get their knowledge about HPV infection and its consequences from mass media (Internet, TV). As many as 75.38% of the surveyed women assessed their knowledge of cervical cancer risk factors and prevention as insufficient or did not know anything about these issues.

**Conclusions:** The survey conducted shows that women's knowledge of the human papillomavirus and its association with the occurrence of cervical cancer is unsatisfactory. Prophylactic measures taken by women are inadequate and knowledge about them is also limited.

## The prevalence and risk factors of postpartum depression in women giving birth in 2019 - 2021

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**Introduction:** Postpartum depression as a serious psychiatric disorder is one of the most common complications after childbirth. It has a negative impact on both the mother and the child. Unfortunately, postpartum depression and its risk factors are still under-researched and under-diagnosed problems among women. In the picture of postpartum depression there are typical symptoms appearing in the course of clinical depressive episodes, which by limiting the woman's life activity and her loss of interest in the newborn, may lead to disturbances in their relationship and, consequently, to abnormal development of the child.

**Aim of the study:** The aim of this study was to assess the prevalence of mood disorders in the perinatal period, including postpartum depression, and to analyze risk factors that may predispose to these disorders.

**Materials and methods:** The study group consisted of 316 women who gave birth between 2019 and 2021. The study was a questionnaire-based survey. Questions pertained to potential risk factors for mood disorders or postpartum depression. Sociodemographic data and information about the course of pregnancy and childbirth were also collected. Statistical analysis was composed using Statistica and Excel.

**Results:** Among the respondents, 5.3% declared doctor-diagnosed postpartum depression. 77.6% of the women experienced postpartum mood disorders (including crying and excessive sleepiness). Depression was diagnosed in 6.8% of the women who declared mood disorders.

**Conclusions:** Based on the results, the predisposing factors for mood disorders are lack of breastfeeding and experience of an unpleasant situation during childbirth. In addition, it was shown that women with higher education are more likely to suffer from postpartum depression. "

## **Interventricular septal thickness as a diagnostic marker of fetal macrosomia**

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Medical University of Łódź

**Presenting author:** Małgorzata Biedrzycka

**Tutors:** Prof. Maria Respondek-Liberska, PhD Iwona Strzelecka

**Introduction:** During pregnancy, many factors can potentially lead to fetal macrosomia, defined as a birth weight of over 4,000 g regardless of gestational age. Significant complications in both mother and newborn resulting from fetal macrosomia indicate the need for its early diagnosis and prevention. Unfortunately, current predictors such as fetal biometry, fundal height, and amniotic fluid index appear to be insufficient.

**Aim Of The Study:** In this study, we decided to assess the predictive potential of an interventricular septal thickness (IVST) as measured at  $\geq 33$  weeks of gestation.

**Materials and methods:** We retrospectively analyzed the medical records of fetuses examined echocardiographically between June 2016 and August 2020 at the Department of Prenatal Cardiology, Medical University of Lodz, Poland. 299 patients met the inclusion criteria:  $\geq 33$  weeks of gestation and a complete medical history including all necessary measurements, namely, IVST obtained by M-mode echocardiography, fetal biometry, and birth weight. Statistica 13.1 PL software was used to generate the receiver operating curve to assess the usability of IVST measurement as a macrosomia predictor.

**Results:** IVST is a promising macrosomia predictor, with an area under the curve of 0,644 (0,525-0,762,  $p=0,0177$ ). Using the Youden index method, a cut-off point of 4,7mm was selected as the most optimal threshold for diagnosis, detecting up to 71,43% of macrosomia cases. Compared to that, the analysis of fetal biometry abnormalities resulted in only 46.43% of macrosomia cases correctly predicted.

**Conclusions:** IVST measurement appears to be superior to sonographically obtained fetal biometry where hypertrophy can be suspected. IVST at  $\geq 4,7$ mm appears to have higher sensitivity and NPV than routine ultrasound.



## **The influence of potential risk factors on the prevalence of ovarian cancer among Polish patients**

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**Presenting author:** Natalia Welc

**Tutors:** MD PhD Gasiorowska E.

**Introduction:** Ovarian cancer is the fifth-most common cancer, the fourth-most common cause of death from cancer, and the first from gynecological cancers among Polish women. It is very often asymptomatic in the early stages or presents symptoms that cannot be considered pathognomonic. There is also no effective screening available. This leads to late diagnosis in a great number of cases, which highlights the meaning and purpose of this research.

**Aim of the study:** Identification of relevant risk factors of ovarian cancer based on the comparison between results of the survey and published research.

**Material and methods:** The surveys from 45 patients diagnosed with ovarian cancer and treated in the Division of Gynecologic Oncology were collected. They consisted of questions concerning basic information (age, height, weight, blood type), gynecologic (menarche, menopause, pregnancies, breastfeeding, lifetime ovulatory cycles, miscarriages, pelvic inflammatory disease, endometriosis, PCOS, use of contraception, hormone replacement therapy) and general medical history (arterial hypertension, diabetes, use of painkillers). Subsequently, statistical analysis was performed and the results were compared to current research.

**Results:** Analysis of collected surveys enabled to determine if examined risk factors affect the probability of coming down with ovarian cancer. The number of lifetime ovulatory cycles exceeded the median value of the study group in 57% of patients with advanced ovarian cancer (FIGO stage III or IV). A positive correlation between women's height and age of diagnosis was found ( $p=0,05$ ). 54% of patients with advanced cancer declared the age of menarche lower than the median value of the study group (13,5 years). 47,8% of women presented blood type A, whereas 15,2% had blood type O (versus respectively 38% and 37% of these types in the Polish population). 13% of women never gave birth and 28,3% never breastfed. 15,2% of interviewees reported taking painkillers, 15,2% - oral contraception and 10,9% - hormonal replacement therapy.

**Conclusions:** The conducted study indirectly confirms the influence of numerous factors on the likelihood of occurrence of ovarian cancer. An extremely clear relationship with the number of lifetime ovulatory cycles and age of menarche should be noted. It is essential to continue exploring potential correlations, especially on larger population groups. Women should be educated in order to raise awareness of ovarian cancer. The results presented above ought to have an impact on the diagnostic and therapeutic process.

## **Peculiarities Of Emotional State Of Premature Newborn Mothers: Links With Stressing Fact**

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Vilnius University Faculty of Medicine

**Presenting author:** Agata Kunigel

**Tutors:** Ieva Sidaraviciute Backiene

**Introduction:** The arrival of the child is considered one of the happiest moments, but for a significant number of women, the postpartum period is extremely difficult psychologically. Approximately 20% of women experience postpartum depression. During it, mothers experience fluctuations in emotions, exhaustion, feelings of hopelessness. These symptoms can negatively affect a mother's ability to take care of herself and her child. Therefore, it is important to detect psychoemotional disorders in a timely manner, to determine the factors predicting depression, to develop primary prevention strategies. Thus reducing the likelihood of clinical depression.

**Material and methods:** An anonymous questionnaire was submitted to the mothers of newborns hospitalized in the Neonatology Department of the VUL SK Children's Hospital. The questionnaire consisted of a demographic, social, and health data questionnaire, the Anxiety and Depression Scale (HAD), the Edinburgh Postpartum Depression Scale (EDPS), and the Parental Stress Scale in the Neonatal Intensive Care Unit (PSS: NICU). Statistical analysis was performed using Microsoft Excel 365, R Commander programs. The difference between the control groups was considered statistically significant at  $p \leq 0.05$ .

**Results:** The survey involved 74 mothers with an average age of 32 years. The predominant period of birth of preterm infants is 33-36 weeks of gestation (39.19%). According to the HAD scale, the majority of mothers experienced severe anxiety, whose children were born at 28-32 weeks of gestation (48.15%). According to the HAD, 13.51% of respondents expressed depression and 36.49% expressed anxiety. Based on the PSS: NICU scale, the most stressful factor was the restriction of the neonatal-parent relationship. The majority of mothers with higher education expressed anxiety (62.79%). Expressed anxiety (39.13%) or depression (15.22%) predominated among mothers whose pregnancies were risk-free. As many as a quarter of respondents had twins, but marked depression and anxiety prevailed among mothers who had one newborn. Although the majority of respondents (63.51%) had a firstborn, women who had a second born felt more depressed (22.22%) ( $p=0.04332$ ) and anxious (37.04%) ( $p=0.6029$ ). 23 respondents who did not have miscarriages felt expressed anxiety ( $p = 0.01852$ ).

**Conclusions:** The analysis of the questionnaires showed that the expressed anxiety is common in one third of the mothers, and the expressed depression is common in almost one in seven. The majority of women who experienced expressed anxiety and depression were not first time mothers. Expressed depression differed statistically significantly between women who had their first and non-first child. Expressed anxiety was statistically significantly more common in women who did not have miscarriages. The biggest stressor was the restriction of the newborn-parent relationship.

## **INTERNAL MEDICINE**

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## Co-infection by DNA viruses in patients after kidney transplantation

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**Introduction:** Polyomaviruses (JCPyV and BKPyV) and cytomegalovirus (hCMV) are the main viral pathogens affecting recipient outcomes after allogenic kidney transplantation. It has been found that infection with both viruses has a greater impact on kidney graft function than a single infection.

**Aim of the study:** was to investigate DNA virus co-infections in post-renal transplant patients and their possible impact on clinical outcomes.

**Material and methods:** Our study consisted of a total of 180 patients (120 recipients and 60 donors). Blood and urine samples were collected 1-year post-transplantation (between 2017 and 2020). BKPyV positive patients were included and subsequently screened for the presence of hCMV and JC polyomavirus (JCPyV). The PCR was performed via the RotorGene instrument. Patients with coinfections were evaluated for clinical outcomes.

**Results:** 36 patients developed BKPyV positivity during the first year after kidney transplantation. 3 patients expressed co-infection by BKPyV and JCPyV and 3 patients with co-infection by BKPyV and hCMV. In total 5, patients developed BK nephropathy and in 1 case it was associated with a co-infection (BKPyV+JCPyV coinfection). No acute graft rejection was noted.

**Conclusion:** According to Assis et al, 2017 the co-infection by BKPyV and JCPyV was found in 6.8% of patients. In our research, the incidence of both co-infections was 8.5%. In the 3 patients with BKPyV and JCPyV, significant BKPyV enhancement was seen in both blood (104 – 105 c/ml) and urine (109 – 1010 c/ml) samples. The co-infections did not affect long term survival of grafts. Further research must be done to define their role in acute transplant rejection. BK virus nephropathy is a serious complication of kidney transplantation. 10%–30% of recipients have BK viremia and nephropathy occurs in approximately 2% (Sawinski 2018). BKPyV reactivation is possibly enhanced in JCPyV co-infection and must be monitored carefully for 12 months post-transplantation. There are currently no antiviral treatments for Polyomaviruses, and reduction or revision in immunosuppressant regime pose threats to both graft and recipient. This further highlights the importance of screening and risk-stratification based on serology.

**Prevalence of chronic kidney disease in patients with kidney stones from the metabolic stone perspective: is there an association? (Literature Review)**

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**Presenting author:** Yasmeen Hassan Al Sadek

**Tutor:** Soha Zouweil

**Introduction:** Previous literature has established a strong link between urolithiasis and the consequent development of impaired renal function and ultimately chronic kidney disease. The research, however, is still in its infancy in terms of identifying the predictive factors, from the metabolic stone perspective, that predispose certain stone formers to adverse renal outcomes.

**Aim of the study:** This literature review was therefore conducted to critically analyse the existing literature and offer suggestions on how to improve research efforts and patient care in the future.

**Material and methods:** An Ovid Medline search was performed (year 2000 to current day) to locate suitable articles. All selected publications were reviewed using the title and abstract and the appropriate articles were fully read. Cohort studies and case control studies were considered in this review.

**Results:** Multiple studies have identified urolithiasis as an independent predictor of CKD . There is a heterogeneity however, that exists in the risk of CKD in stone formers, with certain factors like stone composition, stone burden and the presence of underlying monogenic disorders being found to be predictive of the risk of adverse renal outcomes . The impact of urological interventions on the risk of CKD was shown to be small, with more than 80% of the articles that were reviewed showing a weak association between stone removal techniques (like ESWL and PCNL) and subsequent renal damage.

**Conclusions:** By investigating the contribution of different factors in stone formers towards development of renal damage and CKD, we can then more easily identify patients who are at highest risk of adverse renal outcomes. This ultimately allows health interventions to be introduced early on, thus preventing development of irreversible renal damage. Large scale prospective studies with thorough analysis of stone episodes are therefore needed to better characterise the association between urolithiasis and CKD.

## Investigation of a common chymotrypsin C (CTRC) polymorphism in chronic pancreatitis

Gergő Berke

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Presenting author: Gergő Berke

Tutor: Eszter Hegyi

**Introduction:** Premature intrapancreatic trypsinogen activation acts as a key element in the pathomechanism of chronic pancreatitis (CP) while chymotrypsin C (CTRC) has an important role in preventing this activation process by degrading trypsinogen. Certain CTRC mutations elevate the risk of CP by diminishing the secretion or the activity of the enzyme.

**Aim of the study:** To investigate the role of common p.G60= CTRC polymorphism in CP.

**Material and methods:** To analyze the presence of the p.G60= CTRC polymorphism by PCR amplification followed by Sanger sequencing, we enrolled 291 patients and 349 controls from the Hungarian National Pancreas Registry. In order to compare our results with international data, we conducted a systematic search in 4 databases (Pubmed, Embase, Scopus and Cochrane Library) and after a multi-step screening process we performed meta-analysis. The functional effect of the polymorphism was investigated with gene expression studies in human samples.

**Results:** Altogether, we analyzed data from 5379 patients and 9675 controls. The minor T allele was significantly overrepresented in patients compared to controls in both the Hungarian (OR=2.04, 95% CI: 1.47-2.81) and the international cohort summarized by meta-analysis (OR=2.22, 95% CI: 1.69-2.91). Considering genotypes we noticed a significant difference in the presence of heterozygous and homozygous variants between cases and controls. In homozygous form the variant increased the risk of CP five-fold compared to healthy controls (OR=5.14, 95% CI: 2.71-11.48), while in heterozygous form a two-fold increase was present (OR=1.94, 95% CI: 1.57-2.38). Functional studies showed diminished mRNA expression of the mutated T allele.

**Conclusion:** In our present meta-analysis we showed that the CTRC p.G60= confers an increased risk for developing chronic pancreatitis, especially in its homozygous form. As a result of the mutation CTRC gene expression is decreased, which may lead to lower protein levels thereby affecting an important defensive mechanism against early intrapancreatic trypsinogen activation.

## Influence Of Metabolic Inflammatory Markers On The Formation Of Diabetic Cardiomyopathy In Obesity Patients

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**Introduction:** Type 2 diabetes mellitus (DM-2) is directly involved in the pathogenesis of cardiovascular disease. Due to cardiomyotropic cytotoxic action, an important role in the development of myocardial pathology is played by the proinflammatory interleukin-1 $\beta$  (IL-1 $\beta$ ). It leads to the activation of apoptosis of cardiomyocytes, weakens the contractile function of the heart muscle in vitro and in the cell culture, etc. The metabolic disorders characteristic of DM-2 lead to an increase in factors that can influence the development of myocardial pathology. One such marker of a pathological metabolic cascade is leptin. In patients with diabetes mellitus 2 and obesity, leptin can bind cardiovascular and metabolic disorders, as this hormone is the most important component of the hypothalamic-pituitary system's connection with adipose tissue.

**Aim of the study:** To determine the relationship between leptin and IL-1 $\beta$  on the formation of diabetic cardiomyopathy in patients with DM-2.

**Materials and methods:** Our work is part of the study of Department of Internal Medicine №3 and endocrinology of Kharkiv National Medical University "Diabetes mellitus and comorbid pathology". The analysis of the data of the survey of 82 patients with SD-2 with a body mass index of less than 29.9 kg / m<sup>2</sup> with diabetes of 1 to 9 years of moderate severity was carried out. The control group consisted of 20 relatively healthy individuals who were comparable in age and gender. The levels of leptin and IL-1 $\beta$  were determined by the enzyme immunoassay. As markers of diabetic cardiomyopathy, the determination of echocardiographic (EchoCG) parameters was adopted. For this purpose, the maximum peak of diastolic filling during rapid filling of the left ventricle E, the maximum peak of diastolic filling of the left ventricle during systole of the left atrium A, and their relationship E/A, were determined.

**Results:** Comparing the level of leptin (ng/ml) in the control group and the group of patients, it was found that this level was significantly different - it was respectively 7.59 $\pm$ 0.35 and 12.72 $\pm$ 0.65 ( $p \leq 0.05$ ). The level of IL-1 $\beta$  (pg/ml) was 10.59 $\pm$ 0.27 in the group of patients and 8.12 $\pm$ 0.24 ( $p \leq 0.05$ ) in the control group, and differed significantly in the groups. When comparing EchoCG data, the E/A values in the two groups were significantly different: the E/A level in the control group was 1.4 $\pm$ 0.075, and in the patient group - 0.94 $\pm$ 0.03 ( $p \leq 0.05$ ). which confirms the presence of cardiomyopathy. Correlation analysis between leptin and IL-1 $\beta$  revealed a relationship in the patient group ( $R = 0.580$  ( $p \leq 0.05$ )), whereas no correlations was found in the control group.

**Conclusions:** We believe that in patients with diabetes mellitus 2 and obesity, proinflammatory agents such as the proinflammatory IL-1 $\beta$ , as well as leptin, which has a multifaceted effect on the body and appear to have pro-inflammatory properties, make a significant contribution to the development of cardiac pathology, in particular, diabetic cardiomyopathy.

## **Dietary and other risk factors of constipation during pregnancy**

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**Tutor:** MD Ieva Stundienė

**Introduction:** Constipation is defined as infrequent, painful defecation, hard or lumpy stools, feeling of partial evacuation. Disorder is especially common in pregnant women. Constipation during pregnancy has adverse effects on the physical and mental health of the pregnant women, it diminishes the quality of life. Multiple factors are associated with the prevalence of constipation, some of them can be avoided by developing good habits and adjusting diet.

**Aim of the study:** To evaluate the prevalence of constipation and to identify its risk factors during pregnancy.

**Material and methods:** A self-administered questionnaire was completed by 440 pregnant women during their scheduled gynecologic visits. Information about women's health, pregnancy, physical activity, addictions, use of medication, dietary habits, demographic and socioeconomic factors were gathered. The respondents were divided into 2 groups: constipated (n=223) and not (n=217). All the results of evaluation of risk factors were compared between those 2 groups.

**Results:** 223 (50.7%) of total 440 pregnant women reported having constipation. Higher than average financial income, good living conditions, higher BMI, any or very little physical activity were statistically significant ( $p < 0.05$ ) risk factors. The use of food supplements, vitamins and medication, as well as smoking and alcohol consumption showed no link to constipation. Dietary habits and rate of consumption of following products were assessed: eggs, dairy products, fish, meat, fruits and vegetables, grains and cereals, baked goods. Statistically significant difference between the frequency of consuming each of the products and risk of having constipation were found.

**Conclusions:** Half of the participants reported being constipated during pregnancy. Socioeconomic factors are important when evaluating the risk of constipation. Diet (pattern of the most common products consumption) play significant role in developing constipation. Physical exercises are a protective factor against constipation.



## **Gastroesophageal reflux symptoms characteristics and their association with reflux, pH and impedance monitoring parameters.**

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**Introduction:** Gastroesophageal reflux disease (GERD) diagnosis based on symptoms questionnaire has limited accuracy, but its probability is higher in patients reporting typical than atypical reflux symptoms. The association of symptoms with reflux is the key of successful treatment response and can be best analyzed using pH and impedance monitoring.

**Aim of the study:** An analysis of symptoms profile and their association with reflux, pH and impedance monitoring parameters in patients reporting typical and atypical reflux symptoms.

**Material and Methods:** Ambulatory pH and impedance monitoring of 304 patients (118 male, 186 female, age: 18-77) were analyzed taking into account the following parameters: symptoms profile, symptom association with reflux using SAP and SI scores, acid exposure time (AET), bolus clearance time (BCT), and reflux number and characteristics.

**Results:** GERD was diagnosed in 161 (53%) patients, hypersensitive esophagus in 68 (22.3%) patients, functional heartburn in 9 (3%) patients, and normal test was found in (21.7%) patients. Belching was the most common reported symptom in patients (185 patients in total, 61%) including patients with GERD (59%), hypersensitive esophagus (77%) as well as normal test (56%), and less common in patient with functional heartburn (11%). Belching showed positive SAP in total of 125 (67.6%) patients and was associated with significantly higher number of reflux episodes in recumbent position and gas reflux. Regurgitation and heartburn were reported by 98 (32%) and 85 (28%) patients, accordingly and were associated with significantly higher ACT and number of acid reflux episodes. Positive SAP for regurgitation and heartburn were found in 53 (54%) and 39 (46%) patients, accordingly. Abdominal pain reported by 85 (28%) patients was associated with significantly lower ACT and acid reflux number. Chest pain reported by 40 (13%) patients was associated with longer reflux episodes and higher BCT. Positive SAP for abdominal pain and chest pain were found in only 8 (9.4%) and 3 (7.5%) patients, accordingly. Cough was reported by 59 (19%) patients, but it was positively associated with reflux in only 14 (23.7%) patients. Among patients with GERD reporting heartburn as the main symptom, the criteria for functional heartburn met 14 (14/40; 35%) patients and these patients had a lower reflux number than patients without functional heartburn overlap.

**Conclusion:** Patients with GERD, functional heartburn, and hypersensitive esophagus diagnosed based on pH and impedance monitoring report several similar symptoms. However, belching, heartburn, and regurgitation have positive reflux association more often than abdominal pain, chest pain, and cough. The high percentage of reflux symptoms does not correlate with reflux that indicates their functional background.

## Laboratory and clinical characteristics of autoimmune hemolytic anemia in adults diagnosed in University Hospital Centre Osijek

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**Introduction:** Autoimmune hemolytic anemia (AIHA) is a rare autoimmune disease caused by the production of autoantibodies against the self-antigenic parts of erythrocyte membranes, thus shortening their life span and causing normo-/makrocytic anemia. The majority of AIHA is caused by warm agglutinin disease and mediated via IgG autoantibodies and the result is intravascular and/or extravascular destruction of reds blood cells (RBCs).

**Aim of the study:** The aim of this study was to examine the clinical and laboratory characteristics of AIHA in newly diagnosed adult patients diagnosed and treated at the Clinical Hospital Center Osijek.

**Materials and Methods:** This cross-sectional study was performed using medical records at the Department of Hematology at the Clinical Hospital Center Osijek combined with demographic and clinical characteristics and initial laboratory findings of adult patients with newly diagnosed AIHA in the period from the 1st of December 2018 to the 30th of November 2020.

**Results:** Thirteen patients with newly diagnosed autoimmune hemolytic anemia were included, 7 out of 13 were female (53.8) and 5 out of 13 (46,2%) were male patients. The median value of the age at diagnosis of AIHA was 65 years old (range from 34 to 89 years). AIHA was classified as primary in 4 (30.8%) patients, while in other cases (9 patients, 69,2%) appeared as the secondary, which is associated with various underlying conditions: most commonly with B-lymphoproliferative neoplasms (4 patients, 44, 4% secondary), other autoimmune diseases (2 patients, 22.2% secondary) and infectious diseases (2 patients, 22.2% secondary). Most patients had warm antibody hemolytic anemia (11 patients, 84.6%), cold antibody hemolytic anemia had only one patient (7.7%) and mixed antibody hemolytic anemia also had only one patient (7.7%). The median hemoglobin concentration at the diagnosis of AIHA was 66 g/l (32-84 g/l), while lactate dehydrogenase was 611 U/l (373-1035 U/l).

**Conclusion:** Overall, we conclude that most patients had warm antibody hemolytic anemia and a secondary form of the disease, most commonly associated with malignant diseases (lymphoproliferative neoplasms).

## **Mental well-being among students of selected medical universities in Poland. The role of a family physician.**

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**Tutor:** Prof. Jacek Rysz, MD PhD Małgorzata Koziarska – Rościszewska

**Introduction:** World reports and observations of GP practices indicate that more and more young adults suffer from mental health disorders. According to the available literature, however, they do not always see specialists to get diagnosed or seek help. A special group are medical students on account of their hard studies and high levels of stress entailed by their future jobs. GPs, who have a wide range of patients, can offer adequate support.

**Aim of study:** The aim of the study is to assess the mental wellbeing of students from selected medical universities in Poland and to raise awareness of mental health among students and GPs.

**Material and method:** The group studied includes students of medical programmes (future doctors, nurses, pharmacologists, and paramedics). The study has the form of an anonymous online survey.

**Results:** According to the results, only 20% of students of Polish medical universities describe their mental health as good. 48% of the respondents complain about high levels of stress in their daily lives. 92% of the respondents confirm that the level of stress has increased considerably since they entered university. 51% of the respondents declare anxiety disorders during studies. Despite education at medical universities, the interest of the medical world, and the society's increasing awareness of mental diseases, 22% of the respondents declare that it would be hard for them to ask a psychiatrist or a psychologist for specialist help.

**Conclusions:** Most students of medical universities in Poland assess their mental wellbeing as average. Many of them live under stress, which increased when they became university students. They suffer from sleeping, anxiety, and eating disorders. A GP's availability and knowledge of the patient's health allow to detect and to treat psychological disorders early; during an initial stage a GP can diagnose the patient and recommend further specialist treatment.

## DETECTION OF 18S RIBOSOMAL DNA FRAGMENT IN CEREBROSPINAL FLUID FOR THE DIAGNOSIS OF INVASIVE CNS FUNGAL INFECTION

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**Tutor:** Silvija Kiveryte, Andrius Zucenka

**Introduction:** Invasive fungal infection of the central nervous system (CNS) is a systemic, highly mortal infection of CNS caused by fungus. Diagnosis of such infection is complicated due to low sensitivity of traditional diagnostic methods and their high invasiveness. One of the new methods for the accurate, rapid and minimally invasive diagnosis of invasive CNS fungal infection is the detection of 18S ribosomal DNA (rDNA) fragment by polymerase chain reaction (PCR). Although promising, literature provides scarce data on use of this test when diagnosing invasive fungal infection. Sensitivity and specificity of the assay are 75-100% and 93-98.3% respectively, negative predictive value of the test reaches up to 92.5%, negative likelihood ratio is equal to zero, according to the literature.

**Aim of the study:** The aim of this study is to evaluate the clinical significance of 18S rDNA PCR assay in cerebrospinal fluid (CSF) for the diagnosis of invasive fungal infection of CNS while studying a series of 21 clinical cases.

**Materials and methods:** In a retrospective single-center analysis, 21 patients were selected for 18S rDNA PCR testing in cerebrospinal fluid due to suspected invasive CNS fungal infection from December 2018 to January 2021 in the Laboratory Medicine Center of Vilnius University Hospital Santaros Klinikos. According to the EORTC/MSG criteria, patients were classified to one of four groups: “proven” (n=2), “probable” (n=1), “possible” (n=7) or “none” (n=11) invasive fungal infection. After performing PCR assays, the extent to which test results met the diagnoses determined by EORTC/MSG criteria was evaluated as well as the benefit of the assay in the diagnosis of invasive CNS fungal infection.

**Results:** 18S rDNA PCR analysis in CSF from 21 patients yielded the following results: seven strongly positive (2 patients grouped as “proven”, 1 – “probable”, 3 – “possible”, 1 – “none”), six weakly positive (1 patient from group “possible”, 5 – “none”), eight – negative (3 from group “possible”, 5 – “none”). The assay is rapid and non-invasive, its sensitivity and specificity are 100% and 42.1% respectively, considering that traditional diagnostic methods – culture and microscopic evaluation of biopsy – are golden standard for establishing the diagnosis of invasive fungal infection of CNS. Negative predictive value of the test is 100%, negative likelihood ratio is equal to zero.

**Conclusions:** High sensitivity, negative predictive value and negative likelihood ratio of zero indicate that PCR assay for detection of 18S rDNA fragment in the CSF is particularly useful to rule out the diagnosis of invasive CNS fungal infection. However, the method is not validated, thus it could be useful as an additional diagnostic tool next to the traditional methods.

## **Immunohistochemical characteristics of diffuse large B-cell lymphoma diagnosed at the University Hospital Centre Osijek**

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**Tutor:** Vlatka Periša

**Introduction:** Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of aggressive non-Hodgkin lymphomas (NHLs). Immunohistochemical analysis of DLBCL activation and differentiation markers can be divided into a prognostically favorable (GC) and unfavorable (non-GC) subgroups DLBCL.

**Aim of the study:** The aim of this study is to determine immunohistochemical characteristics of DLBCLs diagnosed in patients in University Hospital Centre in Osijek.

**Material and methods:** This cross-sectional study was performed using medical records at the Department of Hematology at the University Hospital Center Osijek combined with demographic and clinical characteristics and initial laboratory findings of adult patients with newly diagnosed DLBCL. The patients were diagnosed between January 2016 and December 2020.

**Results:** In total 38 patients were included in this study, 21 out of 38 were male patients (55,3%) and 17 patients (44,7%) were female. The median age value of the patients is 67 with range from 20 to 81 year of age. 13 out of 38 (34,2%) patients were classified as germinal centre subgroup (GC) while 25 patients (65,8%) were classified as non-germinal centre subgroup (non-GC). c-MYC immunohistochemical expression had 7 patients (18,4%) and 31 (81,6%) did not show c-MYC expression. In both subgroups, GC and non-GC, c-MYC predominantly was not expressed. In the GC subgroup c-MYC expression was proved in 4 out of 13 patients (30,8%). It was expressed only in 3 patients (12%) of non-GC subgroup.

**Conclusion:** Based on these results we can conclude that DLBCL affects both sexes approximately equally. About two-thirds of the patients are classified as non-GC subgroup and in both subgroups (GC and non-GC) c-MYC is not overexpressed.

**Weight loss, regardless of its size, achieved with intragastric balloon therapy has beneficial effects on serum metabolic and liver function parameters.**

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**Aim of the study:** The assessment of efficacy and safety of IGB therapy.

**Material and method:** A retrospective analysis of 40 patients (15F/25M) treated with IGB (Orbera™ Intragastric Balloon System). Before and 6 months after IGB placement the following parameters were assessed: body mass index (BMI), % excess weight loss (%EWL), comorbidities, laboratory blood tests, and procedure complications.

**Results:** Mean BMI before and 6 months after IGB therapy was  $51.5 \pm 14.2$  and  $43.5 \pm 13.7$ , accordingly. The %EWL was  $33.6 \pm 28.5$ . The IGB therapy decreased mean levels of glucose ( $100.8 \pm 17.3$  vs  $97.6 \pm 19.3$  mg/dL), insulin ( $16.1 \pm 8.4$  vs  $12.8 \pm 8.1$  IU/ml), hemoglobin A1c ( $5.91 \pm 0.67$  to  $5.5 \pm 0.45$  mmol/mol), HOMA index ( $4.78 \pm 3.84$  vs  $2.94 \pm 1.83$ ), aminotransferases, (ALT-  $51.7 \pm 30.6$  vs  $31 \pm 16$  U/l, AST-  $35.3 \pm 15.9$  vs  $24.3 \pm 7.5$  U/l), and triglycerides ( $161.1 \pm 74$  vs  $124.6 \pm 62$  mg/dL). However, observed beneficial changes in serum metabolic and liver function were similar in patients with  $\%EWL \geq 25$  and  $\%EWL < 25$ . In addition, the IGB therapy led to the reduction in antidiabetic drugs and proton pump inhibitors use. We did not observe serious adverse events except one partial balloon deflation found on the day of its planned removal and balloon intolerance one day after placement that required its removal. Overall, 16 patients were then qualified to bariatric surgery. In addition, IGB remained the only method of obesity therapy for 3 patients with contraindications to surgery and 6 patients who did not agree for surgery (in 2 patients the IGB therapy was repeated).

**Conclusions:** The IGB therapy is an effective and safe method of body weight reduction that is associated with improvement of several serum metabolic and liver function parameters. These observed benefits are independent of the size of weight loss. The IGB therapy is useful for certain groups of obese patients with high surgical risk, contraindications to surgery or younger patients that prefer to lose weight by using non-invasive options, and as a bridge to bariatric surgery.

## Searching for dependences between asthma treatment control and neuropsychiatric factors – initial report

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**Introduction:** The incurable nature and varied phenotypes of asthma direct attention to finding suitable medication to control the disease while overlooking other possible disorders threatening imminent future. Correct control of the disease gives the only possibility to keep the proper life quality. Covered with asthma symptoms and complications there is a real danger of missing the dependences on age-related diseases, such as neurodegenerative disorders, which occurrence could be accelerated or which frequency could be increased.

**Aim of the study:** Comparing current asthma control and quality of life with cognitive functions disorders in assessment tests of the patients. To find possible connections between asthma and neurodegenerative processes.

**Material and methods:** The study comprised of asthma treatment control tests, (Asthma Control Test[ACT], Asthma Control Questionnaire[ACQ], Modification of the Asthma Quality of Life Questionnaire[AQLQ(S)]), spirometry, questionnaires assessing patients' quality of life (St. George's Respiratory Questionnaire[SGRQ], 36-Item Short Form Survey[SF-36]) and the neuropsychiatric part consisting of Clock Drawing Test, Mini Mental State Examination[MMSE], Abbreviated Mental Test Score[AMTS], short version of Geriatric Depression Scale[GDS], Hamilton Scale[HS]. Two groups of participants were formed in the study -the first included 26 participants with asthma, the second was a control group with 25 participants without any obstructive lung disease. A diagnosed neurodegenerative disease or suspicion of it was an excluding criterion.

**Results:** All of the participants completed all examinations. ACT showed strong correlation to AMTS( $r=0,433$ ) and to HS( $r=-0,528$ ). ACQ presented other dependence on MMSE( $r=-0,517$ ) and AMTS( $r=-0,430$ ). AQLQ(S) correlated with MMSE( $r=0,559$ ), AMTS( $r=0,402$ ) and HS( $r=-0,477$ ). SGRQ exhibited relevance to AMTS ( $r=-0,417$ ) and ( $r=0,508$ ). The functional examination of lungs revealed the relationship with MMSE in following parameters: FEV1( $r=0,472$ ), PEF( $r=0,408$ ). In SF-36 scale only five of nine domains revealed strong relationships with the other scales: "Physical functioning" with MMSE( $r=0,557$ ) and HS( $r=-0,493$ ); "Role limitation due to physical health" with MMSE( $r=0,477$ ); Role limitation due to emotional problems" with MMSE( $r=0,473$ ); "Energy/fatigue" with MMSE( $r=0,410$ ); "Health change" with HS( $r=-0,445$ ). Moreover only 17 participants in research group were able to draw the clock correctly. In comparison, in control group 24 participants did it correctly.

**Conclusions:** The participants suffering from asthma achieved lower scores in MMSE which proved greater cognitive functions loss. They also gained more points in HS, which is used to diagnose depressive symptoms. The clock drawing difficulties and the correlation between the spirometry parameters and MMSE further supported the thesis that asthma patients, due to lower oxygenation, could develop neurodegenerative changes in the brain resulting in cognitive disorders.

## **The willingness to use and the assessment of the self-developed, dietary mobile application Dialysis Pocket Assistant among hemodialysis patients**

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**Tutor:** Prof. Michał Nowicki

**Introduction:** Nowadays, mobile applications supporting the treatment have gained popularity in every field of medicine. Adherence to dietary regime in chronic dialysis patients is extremely demanding, so there is a strong need of tools helping to maintain the proper diet. Dialysis Pocket Assistant DiPA is the self-developed dietary mobile application created to improve dietary adherence among dialysis patients.

**Aim of the study:** The aim of the study was to assess the willingness of hemodialysis patients to use DiPA, their satisfaction and to identify the profile of future DiPA users. The other goal was the assessment of the satisfaction and expectations of users.

**Material and methods:** The study included 58 hemodialysis patients (20F, 38M) from a public dialysis center, age  $64.1 \pm 14.1$  years treated with hemodialysis three times a week, time on dialysis  $3.1 \pm 2.4$  years. Patients were asked about their interest in using DiPA and taking part in a short assessment of the applications. 51.7% of the patients, (12F, 18M), age  $71.0 \pm 9.81$  years, time on dialysis  $2.95 \pm 2.09$  years refused to take part in the assessment of DiPA. 48.3% of the patients (7F, 21M), age  $56.8 \pm 14.3$  years, time on dialysis  $3.2 \pm 2.6$  years agreed to assess the application. In the first part of the assessment the patients were asked to use DiPA for 10 minutes. Their reactions and functions, which they discovered were observed. In the second part patients answered 14 single-choice questions about the usefulness and satisfaction from using DiPA. In the last open-question patients could provide their suggestions on what could be improved.

**Results:** Only 48% of patients declared an interest in using DiPA. The most common reasons why the patients were not eager to use DiPA were a lack of a smartphone - 58.6% or a lack of ability to use the smartphone - 35.5%. Comparing patients interested and non-interested we found a significant difference in a median age 72.5 vs 57.0,  $p < 0.005$  and no significant difference in a median time on dialysis 2.7 vs 2.5 years,  $p = 0.95$  retrospectively. In the group of patients which took part in the assessment the majority had a high level of willingness to change their diet.  $\frac{3}{4}$  of them prepared meals by themselves. Over 80% of the patients were convenient that DiPA application will help them follow dietary recommendations and have an impact on their diet. Over 70% of the patients were satisfied with the application and reported that transparency, simplicity and quality of recipes met their expectations.

**Conclusions:** The most important obstacles in introducing DiPA application were the lack of a required smartphone and abilities to use a smartphone. Younger age of the patients on the contrary to time on dialysis has a great impact on the interest in using DiPA application. DiPA was assessed as a convenient, simple and transparent application which can improve the dietary adherence of hemodialysis patients.



## **Retrospective comparison of colonoscopy database in outpatients and inpatients admissions.**

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Tutors: Prof. Ewa Małeczka-Panas, MD PhD Adam Janiak,

**Introduction:** The data on the adequate bowel preparation and the frequency of the most common diagnoses from colonoscopy results in inpatients and outpatients admissions are inconsistent.

**Aim of the study:** The main aim of the study was to compare colonoscopy results between the outpatients and inpatients groups.

**Materials and methods:** Colonoscopy results were evaluated in 200 patients, aged 58,91, +/-16.61, 105 women, 95 men, examined in Barlicki University Clinical Hospital in Lodz in Poland from 2020 to 2021. The patients from the first group (Group 1) were hospitalized and the second one (Group 2) were admitted as outpatients. The average age of inpatients was 58.41 +/-18.36 and that of outpatients was 59.4 +/-14.73. We had taken into consideration: The Boston Bowel Preparation Scale (BBPS), Cecal Intubation Rate, Adenoma Detection Rate, the number of patients with the most common diagnoses.

**Results:** Among all 200 patients, 49 (24.5%) were poorly prepared (BBPS: 0-3), 117 (58.5%) – moderately well prepared (BBPS:4-6) and 34 (17%)- well prepared (BBPS: 6-9). The average score of BBPS in the whole group was 4.98 +/-2.01. Cecal intubation was achieved in 157 (78,5%) patients out of 200. Adenomas were detected in 46 (23%) patients. The most common diagnoses were: haemorrhoids- 100 (50%) patients, at least one polyp -in 86 (43%), diverticula -in 47 (23.5%) , inflammatory bowel disease (IBD) -in 26 (13%), colorectal tumors -in 10 (5%), radiation proctitis – in 2 (1%), rectostenosis - in 2 (1%) and proctitis - in 2 (1%) patients. In Group 1. there were 21 patients with IBD and in Group 2. - 5 (p<0.05). The cecal intubation rate was 91% in outpatients and 66% in inpatients, p=0.000017.

**Conclusions:** The majority of the patients were moderately well prepared for colonoscopy. Cecal intubation rate was unsatisfactory in most patients. The results of Cecal Intubation Rate were significantly better in outpatients than in inpatients. In both groups the most common diagnoses were similar: haemorrhoids, polyps, diverticula and IBD. IBD were detected significantly more frequently in inpatients than outpatients.

## **Association between circadian cycle, glucose metabolism and hypoxia: evaluation of Rev-Erb- $\alpha$ and NPAS2 protein level in obstructive sleep apnea patients**

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**Introduction:** Obstructive sleep apnea syndrome (OSA) is a chronic condition characterized by recurrent pauses in breathing during sleep (e.g. apneas), which lead to intermittent hypoxia, hypercapnia, arousals and sleep fragmentation. The complications of OSA are including cardiovascular diseases, diabetes mellitus type 2 (DM2) and circadian rhythm disruption. Circadian clocks are endogenous coordinators of 24-hour rhythm of behavioral and molecular processes in mammals. For humans, a master clock modulating circadian rhythms is located in hypothalamus. It is composed of set of genes, which function as: activators – CLOCK and BMAL or repressors - Period (encoded by PER) and cryptochrome (encoded by CRY). Neuronal PAS Domain Protein 2 (NPAS2) can substitute CLOCK in their function. Knockout of only NPAS2 or CLOCK gene has no severe effects on behavioral rhythms in mice, however knockout of both NPAS2 and CLOCK leads to total arrhythmicity behavior. Orphan nuclear receptor Rev-Erb  $\alpha$  is another protein supporting CLOCK-BMAL1 complex forming the loop which helps to regulate their expression. There are studies suggesting significant influence of circadian disruption mediated via NPAS2 and Rev-Erb  $\alpha$  on DM2 development.

**Aim of the study:** The aim of the study is to determine the role of NPAS2 and Rev-Erb  $\alpha$  in patients suffering from OSA in the context of circadian rhythms disruption and DM2 development.

**Material and method:** All participants underwent polysomnography (PSG) examination and based on apnea hypopnea index accompanied by clinical data the recruited individuals (n=40) were assigned to one from 3 groups: OSA (severe OSA, no DM2; n=17), DM2 (severe OSA + DM2; n=7) and control group (no OSA, no DM2; n=16). Serum protein levels of Rev-Erb- $\alpha$  and NPAS2 were be assessed with ELISA immunoassay.

**Results:** The mean serum protein level for Rev-Erb  $\alpha$  was: 240.93 ( $\pm$ 73.46), 271.31 ( $\pm$ 89.66) and 272.04 ( $\pm$ 92.81) pg/ml for OSA, DM2 and control group respectively. The mean serum protein level for NPAS2 was: 117.07 ( $\pm$ 55.29), 198.28 ( $\pm$ 89.66) and 186.22 ( $\pm$ 166.31) pg/ml for OSA, DM2 and control group respectively. Analysis between the groups revealed the statistically significant difference between groups only in case of NPAS2 (p=0.037). Further post-hoc analysis revealed significant differences between OSA and control group (p=0.017). Moreover, the statistically significant correlation between apnea-hypopnea index during REM and NPAS2 serum protein level was observed (r=-0.478, p=0.002).

**Conclusions:** Serum NPAS2 protein levels which are involved in circadian rhythms are associated with number of apneas and hypopneas during REM phase of sleep and might have a significant role in the development of OSA and its complications. Further studies are needed into circadian clock in OSA patients to understand its role in pathomechanism of OSA complications.

## OVERVIEW OF DIAGNOSTIC AND CLINICAL CHARACTERISTICS OF PATIENTS WITH UNSTABLE ANGINA

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**Introduction:** It is known that cardiovascular diseases create one of the highest burdens in developed countries. For patients who have normal high sensitivity cardiac troponins unstable angina is a common cause of acute chest pain. About 10% of the patients that are complaining of chest pain and have no evidence of acute cardiomyocyte injury are diagnosed with UA.

**Aim of the study:** We aimed to overview baseline, clinical and instrumental characteristics of patients who came to the hospital and was diagnosed with UA.

**Materials and methods:** We analyzed 840 case histories of patients diagnosed with unstable angina in Vilnius University Hospital Santaros Klinikos over the period of 2017-2018. Patients who have not been tested for a high sensitivity cardiac troponin-I (hs-cTnI) and have not undergone coronary angiography (CAG) were excluded. Due to signs that patients' diagnosis could be altered to myocardial infarction (MI; according to Fourth Universal Definition of Myocardial Infarction) 381 patients were eliminated from a final analysis. Gender, age, history of coronary artery disease, CAG, percutaneous coronary intervention (PCI), coronary artery bypass graft surgery (CABG) data, hs-cTnI values, clinical presentation and treatment given at a discharge were analyzed. Normal value of hs-cTnI was referred as  $\leq 15,6$  ng/l in women and  $\leq 35,2$  ng/l in men. Statistical analysis was made with Excel and RCommander.

**Results:** Data of 334 patients was analyzed – 227 (67,96%) were men. Median age of men was 64 [16,5], women – 68 [15,5]. Previously documented MI was found in 113 (33,83%) of cases, 127 (38,02%) had previously performed PCI, and CABG was performed in 34 (10,18%). Ischemic ECG changes were found in 148 (44,31%) of cases. T wave inversion - 89 (26,65%), ST segment depression - 52 (15,57%), left bundle branch block - 10 (2,99%), no ECG changes - 176 (52,69%). Median level of hs-cTnI at arrival was 6,4 [7,02]. CAG was performed in all patients, in 263 (78,74%) significant ( $\geq 50\%$  the diameter of artery) coronary artery stenosis was found. Similar pain was felt by 276 (85,71%) patients previously. 95,96 % (n=309) indicate having chest pain, 170 (52,80%) related pain to physical activity. Also 54 (40,0%) said they had prolonged pain ( $\geq 20$  minutes). 98,5% (n=329) got antiplatelet therapy at a discharge. 243 (72,75%) got double antiplatelet therapy, 43 (12,88%) got one antiplatelet drug, 30 (8,98%) got triple antithrombotic therapy. After evaluating the history of coronary heart disease and coronary angiography, obstructive coronary disease was detected in 263 (78,74%) of cases.

**Conclusions:** Unstable angina is 2,1 times more common in men. Men diagnosed with unstable angina are 4 years younger than women. Median troponin levels are within normal range. More than half of patients had no changes in ECG. More than a third of patients had prolonged pain. In about two thirds of cases pain did not irradiate. Almost all patients got antiplatelet treatment at a discharge and about three quarters had double antiplatelet therapy.

## **NEUROLOGY AND NEUROSURGERY**

**COORDINATORS:** Marysia Wołyniak Anna Gehrmann

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## Pregnancy in women with epilepsy – a retrospective single-center study

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**Tutors:** MD PhD Magdalena Bosak

**Introduction:** Epilepsy is one of the most common chronic neurologic conditions and can be described by a lasting predisposition to generate spontaneous epileptic seizures which has numerous neurobiological, cognitive and psychosocial consequences. The literature shows a considerable interest in the impact of epilepsy on the reproductive health of women with childbearing potential, including contraception, fertility, teratogenic risk of antiepileptic drugs, delivery, and breastfeeding. Adequate knowledge about the course of pregnancy and labour is essential to provide proper management strategies.

**Aim of the study:** This work aimed to analyse the course of pregnancy and labour in pregnant women with epilepsy, including also the pattern of therapy and antiepileptic drugs.

**Material and methods:** We retrospectively reviewed medical records of sixty pregnancies from 53 patients treated in the epilepsy clinic at the University Hospital in Cracow from 2012 to 2020. Information on pregnancy, delivery course and complications, delivery mode, birth weight, Apgar score, and feeding method were collected.

**Results:** The mean age of pregnant women was 30.6 years  $\pm$  4.3 years. In the vast majority of pregnancies (55, 91.7%) patients were treated with monotherapy. The most frequently used medication of all cases of monotherapy was levetiracetam (24, 43.6%), followed by lamotrigine (15, 27.2%) and carbamazepine (8, 14.5%). Five patients were on polytherapy, mostly that was a combination of levetiracetam and lamotrigine. In most pregnancies (35, 58.3%) seizures were not observed. Healthy infants were born in the majority of pregnancies (44, 73.3%). Most were born by caesarean section (38, 63.3%) and mostly, newborns were delivered at term (36, 60.0%). Most newborns had a normal birth weight defined as the weight between 2500 g to 4000 g (53, 88.3%) and scored 10 Apgar points (41, 68.3%). The mean birth weight was 3298.6 g  $\pm$  506.1 g. Breastfeeding was reported in most pregnancies (38, 63.3%). In most pregnancies, women did not have seizures in the postpartum period (33, 55.0%) and their treatment after labour was maintained (34, 56.7%). According to collected medical records, only 8 women (15.1%) had at least one miscarriage in their life.

**Conclusions:** Although all patients received antiseizure medication during pregnancy, among well-treated epilepsy patients, pregnancy and labour are mostly without complications. Most women delivered healthy babies, and in the majority, they have no seizures in the time after delivery.

## **Atmospheric factors associated with migraine and common headache occurrence - evidence from the internet analysis.**

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**Presenting author:** Jakub Radziwon

**Tutor:** MD Jacek Gozdalski

**Introduction:** Each year 79% of European population have at least one headache, of which the most popular are tension-type and migraine. Moreover 7% of people experience headache on over 15 days in month, what brings the negative impact not only limited to the time of episode, but also affecting many areas of everyday life such as professional activity or family relations. Globally, headache disorders are the third cause of years lived with disability (YLDs) but among 15-49-year-olds it is still the most common reason.

For people affected by disease, knowledge and avoidance of initiating factors are crucial. The triggers for migraine are well-known of which the most popular are emotional stress, menstruation, fasting and disturbance of sleep. About half of patients report the influence of the weather, but researchers remain inconsistent on which atmospheric condition may trigger migraine. High temperature, decreasing pressure, low humidity and rainfall were frequently mentioned.

As non-severe headache conditions may not be always reported to a physician and are often underdiagnosed, a new approach to estimate their incidence is needed. The infodemiology - a science of health-orientated internet analysing allows us to track the interests of millions of internet users, concerned about their health issues.

**Aim of the study:** The aim was to investigate which atmospheric conditions may have an influence on the occurrence of headache disorders.

**Materials and methods:** Half-year meteorological data including maximal temperature, humidity, atmospheric pressure and daily rainfall were acquired from three weather stations among Poland. Internet searching for terms 'headache' and 'migraine' was observed in these particular regions by using GoogleTrends website. Direct influence, radical conditions and rapid changes of weather has been taken into account.

**Results:** The impact of meteorological conditions was more significant on "migraine" browsing, which was generally less popular term. The strongest factors associated with increased searching have been high and fast rising daily temperature. Low and decreasing humidity was connected with elevated browsing of headache-related terms in central Poland, but diminished in the seaside region. As well as sudden decrease of atmospheric pressure intensified searching of both terms. No connection between rainfall and headache searching was found.

**Conclusions:** Weather changes have a significant effect on searching headache-related terms and relationship with episodic migraine occurrence is very probable. Consequently, prolonged exposure to high temperatures, low humidity and declining atmospheric pressure should be avoided by afflicted patients if possible.

## The relation of cognition and disorders of volitional saccades in essential tremor

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**Introduction:** Eye movements are a great source of information for both clinicians and scientists as their abnormalities frequently seem to localize a disease process. Eye movement control is complex and involves many brain areas, including the brainstem, cerebellum, basal ganglia, and cerebral cortex. Rapid eye movements that abruptly change the point of fixation are called saccades. Volitional saccades are sensitive markers in the assessment of cortical areas connected with cognition. Essential tremor (ET) is the most frequent movement disorder. Many studies have proved the presence of mild cognitive dysfunctions supported by frontal regions in ET. To our best knowledge, there are no previous studies to evaluate the relationship between saccades and cognition in ET.

**Aim of the Study:** Our study aimed to assess the relationship between the abnormalities in volitional saccades and cognitive function in ET.

**Materials and methods:** Sixteen ET patients (6 females, 10 males, average age:  $55 \pm 26$  years, average disease duration:  $14 \pm 11$  years) and the control group consisted of 10 healthy subjects matched by age and gender were included in the study. The diagnosis of ET was made according to the National Institute of Health Collaborative Genetic Criteria (1996) and Tremor Research Investigatory Group Criteria. The team has used the Saccadometer Research device (Ober Consulting, Poland) to record antisaccades and memory-guided saccades. In order to assess the parameters of saccades, both Ober Consulting's algorithms and ResearchAnalyzer software were used. Correct saccades were classified accordingly to the algorithms developed by Ober Consulting and further verified manually, according to criteria used in the previous research. To estimate cognitive function, we implemented a battery of tests including BVRT, Stroop test, SDMT, AVLT, and many others. For grading the tremor severity, Clinical Rating Scale for Tremor (CRST) was applied.

**Results:** Antisaccades latency rose with age, disease duration, CREST score, decrease in Stroop test, in Verbal Fluency test, and AVLT test.

**Conclusions:** Prolonged saccadic latency in ET correlated significantly with disease progression and cognitive decline, especially in terms of verbal fluency, visual-spatial attention divisibility, short and long-term memory impairments, so this parameter may be very useful in making a diagnosis and following the disease progress.

## **The Anatomy of the Convergence of Major Deep Cerebral Veins in the Pineal Region**

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**Introduction:** The anatomy of the veins in the pineal region is one of the most complex areas in the brain because all major deep cerebral veins converge there: the internal cerebral veins (ICVs), the great cerebral vein of Galen (GV), the basal veins (BVs), and the internal occipital veins (IOVs).

**Purpose:** The aim of this study was to comprehensively describe the anatomy of the veins in the pineal region using computed tomography angiography.

**Material and methods:** Head computed tomography angiography scans of 250 adult Polish patients were evaluated. We assessed the location of the junction of 2 ICVs and the presence of a narrowing of the GV and arachnoid granulation at the GV-straight sinus junction. We evaluated the presence, appearance, and termination of the BV, and the presence and termination of the IOV.

**Results:** The study showed that 2 ICVs converged posterior to the splenium of the corpus callosum (62.4%). Narrowing of the BV was observed in 51.2% of patients, and the arachnoid granulation was found in 25.2%. The 3 segments of the BV were well visualized in 66% of the studied hemispheres. The BV flowed into the GV in 34.8% of the hemispheres. The IOV was present in 90.2% of the hemispheres and terminated medially in 84.5%.

**Conclusions:** Because an injury to major deep cerebral veins may result in severe postoperative neurologic deficits, it is essential for neurosurgeons to be familiar with both normal and variant patterns of veins in the pineal region.



## Non-epileptic Paroxysmal Events In Childhood-adolescence

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**Tutor:** MD PhD Jurgita Grikinienė

**Introduction:** Approximately 20% of pediatric patients who are referred to a neurologist for suspected epilepsy have non-epileptic seizures. The duration, place, timing of the attacks, and state of consciousness may confuse pediatricians about the diagnosis of epilepsy and non-epileptic paroxysmal events. Determining the exact prevalence of nonepileptic seizures is complicated because they are often unrecognizable or confused with epilepsy. Incorrect diagnosis of epilepsy exposes the child to the risk of side effects of antiepileptic drugs, psychological or physical harm, may affect the child's personality development, social life, learning while the real cause of seizures remains untreated.

**Aim of the study:** To determine the prevalence of non-epileptic seizures in children-adolescent age group.

**Material and methods:** An anonymous questionnaire was conducted at Vilnius University Children Hospital in 2019-2020. 6th year medical students participated in the study. The questionnaire included 11 conditions manifesting as paroxysmal events. Participants were required to indicate whether they had at least one such paroxysm in childhood-adolescence. Students completed the questionnaires during the pediatric neurology cycle therefore they were able to more accurately assess previous seizures. The results were compared with the prevalence of nonepileptic paroxysms in other recent studies conducted worldwide. The data collected in the questionnaire were processed using Microsoft Excel 2020, statistical analysis was performed using IBM SPSS Statistics 24.0. The difference between the variables was considered statistically significant if  $p < 0,05$ .

**Results:** 158 student questionnaires (72,2% of them women) were evaluated. The age of participants was 22-25 years. Only 3,2% of respondents did not experience any non-epileptic seizures during childhood or adolescence. Of the reported seizure conditions, hypnic jerks (89,2%) and déjà vu (71,5%) were the most common. Other paroxysms occurred less frequently: syncope (48,7%), tics (32,3%), somnambulism (30,4%), migraine (26,6%), panic attacks (25,9%). The least frequent paroxysms were jactatio capitis nocturna (7,59%) and febrile seizures (1,3%). Epileptic seizures did not occur in any of the students. Syncope ( $p=0,008$ ) and sleep myoclonus ( $p=0,015$ ) were statistically significantly more common in women than in men.

**Conclusions:** The majority of respondents experienced at least one non-epileptic seizure during childhood or adolescence. Hypnic jerks and déjà vu remain the most common pediatric non-epileptic paroxysmal events. Syncope and sleep myoclonus are more common among women. Prevalence of somnambulism, panic attacks and tics was significantly higher than in other studies.

## Effect of GPR-18 ligands in Lipopolysaccharide-Stimulated BV2 Microglial Cells

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**Introduction:** GPR18 belongs to the largest family of G protein-coupled receptors (GPCR) targeted by drugs and is assumed to be an orphan receptor. The expression pattern of GPR18 in cells and tissues of the immune system may indicate its involvement in immunomodulatory and inflammatory processes. Accumulating evidence supports that chronic neuroinflammation is a common feature in nowadays getting older societies, neurodegenerative disorders (ND) including Alzheimer's disease (AD), Parkinson's disease (PD) and amyotrophic lateral sclerosis (ALS). Microglia represent the immune system in the central nervous system and behave like a specialized population of macrophage-like cells. It means that microglia are responsible for homeostasis in the microenvironment of the brain and may play a complex role in the pathophysiology of ND.

**Aim of the study:** The main goal of this study was to extend knowledge on the neuroprotective mechanism of GPR18 receptor ligands in microglia cells.

**Materials and methods:** First, to establish a functional in vitro model of neuroinflammation, BV-2 microglia cells were treated with increasing concentrations of lipopolysaccharide (LPS). The level of nitrate (NO) - a commonly assessed neuroinflammatory endpoint – was quantified by Griess reagent. The expression levels of proinflammatory cytokines (IL-1 $\beta$ , IL-6, TNF- $\alpha$ ) were determined by RT-qPCR. Next, activated microglia cells were treated with GPR18 ligands (KD-107, THC) for 24h. The mRNA of proinflammatory cytokines and NO level were examined. As a reference compound, indomethacin and ketoprofen were used.

**Results:** The results showed that the NO production was attenuated by GPR18 agonist that was applied 1h after the application of LPS and the mRNA levels of IL-1 $\beta$ , IL-6, TNF- $\alpha$  were significantly decreased in comparison to LPS-treated cells.

**Conclusions:** GPR18 ligands possess the anti-inflammatory properties and may control microglia function for therapeutic purposes. This knowledge will allow the use of GPR18 ligands as a pharmacological target in neuroinflammation.

## **fMRI Implications of an atypical case of Rasmussen Encephalitis**

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**Presenting author:** Lorenzo Nigris

**Tutor:** Prof. Koritnik Blaž

The Rasmussen Encephalitis is a disease involving mostly the pediatric population, characterized by a single-hemisphere involvement with an unknown aetiology and a clinical presentation characterized by epilepsy, motor deficiencies, cognitive deterioration, homonymous hemianopia and, if the dominant side is affected, aphasia. The decisions whether to perform surgery and the perfect timing for this treatment represents a medical dilemma. The question is even harder if we consider atypical presentations for age and dominant side involvement, and literature does not give a unequivocal answer to this question. In the present article we report a case of Rasmussen encephalitis with left-side involvement and atypical presentation for age. We analyze the fMRI study made on the patient and we discuss the future management options.

## **ONCOLOGY**

### **COORDINATORS:**

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## Comparison Of Laparoscopic Sentinel Lymph Node Identification and Open Pelvic Lymphadenectomy In Low-risk Uterine Cancer

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**Tutors:** PhD MD Živilė Gudlevičienė, MD Rūta Čiurlienė

**Introduction:** uterine cancer is one of the most common cancers in the world. In order for women to experience as few complications as possible, alternative surgical treatments have been sought. **The aim of the study:** To compare treatment outcomes in laparoscopic hysterectomy with sentinel lymph node (SLN) and open hysterectomy with systemic pelvic lymphadenectomy in patients with low-risk uterine cancer. **Material and methods:** The retrospective analysis method was applied, analyzing data of women with low-risk non-locally advanced uterine cancer treated in the Oncology Department of NCI from year 2019. Patient data was taken from the ELI information system. Statistical analysis was performed using the statistical program “Excel for Windows 2019”. Data differences were considered statistically significant with  $p < 0.05$ . **Results:** 76 patients were operated on low-risk uterine body cancer and 76 medical histories meeting the study criteria were analyzed during the study period. Patients were divided into two groups: the first group - patients who underwent laparoscopic hysterectomy with SLN removal ( $N = 29$ ); the second group - patients who underwent open surgery - hysterectomy with systemic pelvic lymphadenectomy ( $N = 47$ ). SLN was found in 29 of 29 patients (100%). 25 patients out of 29 (86.2%) had SLN on both sides and the other 4 patients (13.8%) had SLN, detected only on one side. In the second group, the average of lymph nodes removed was  $11.1 \pm 5.96$ . Lymph node metastases were not found in either of the patient groups. The average duration of surgery in the first group was  $160.5 \pm 42.52$  minutes, in the second  $124.1 \pm 40.53$  minutes and this was a statistically significant difference ( $p = 0.00039$ ). Comparing the incidence of complications in both groups: no complications were found in the SLN group, complications in the systemic lymphadenectomy group occurred in 12.8% of patients (6 of 47). The difference between the groups was statistically significant ( $p < 0.05$ ). The observed complications in the second group were evaluated according to the Clavien-Dindo classification and corresponded to: two 4a, two 3a and two 2. The average number of bed days in the first group was  $6.0 \pm 3.06$  days, in the second group  $8.9 \pm 3.42$  days ( $p = 0.00168$ ). **Conclusions:** Endoscopic surgery is the first-line treatment method for the treatment of early-stage uterine body cancer. Identification of the sentinel lymph node is an alternative and accurate surgical stage for low-risk uterine cancer. Considering the frequency of complications and the time of hospitalization, a minimally invasive technique is superior to open surgery.

## **Extent of Palliative Care need among cancer patients undergoing chemotherapy: A cross sectional study**

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**Tutor:** MD PhD TVSVGK Tilak

**Aim of the study:** To assess the extent of palliative care need among cancer patients undergoing chemotherapy using the GSF Prognostic Indicator and SPARC Questionnaire.

**Material and methods:** A comprehensive survey was undertaken among cancer patients undergoing chemotherapy in a tertiary care centre in Western Maharashtra in February, 2020. After due consent, participants were screened for palliative care need according to the Gold Standards Framework (GSF) Prognostic Indicator criteria. Participants completed the Sheffield Profile for Assessment and Referral to Care (SPARC), a needs assessment tool that measures unmet needs across 7 domains from 0-3. Data was analysed using SPSS (USA) 23.0 and results were considered significant if  $p < 0.05$ .

**Results:** 127 consecutive cancer patients were included, with a mean age of  $55.39 \pm 12.68$ . 38% of participants met the GSF criteria for palliative care need. Patient self reported data indicated that participants who rated a score of 3 for one or more domains in the SPARC questionnaire were 4.7 times more likely to meet the GSF criteria. The most frequently reported unmet needs among these patients were fatigue (76%), pain (71%), anxiety (49%), dependence (49%) and bowel and bladder issues (38%). Participants aged 60 and above scored higher on domains like loneliness and fatigue, compared to younger age groups who reported more concerns about issues like loss of independence, anxiety, etc.

**Conclusion:** Our results reveal that over a third of cancer patients undergoing chemotherapy met the GSF criteria for palliative care need. It provides evidence of a large unmet need across various domains among patients, who may benefit from introduction of adjunctive palliative care, and lends support for the use of similar tools in the hospital setting.

## A Descriptive Study To Assess The Association Of Geriatric Score With Observed Chemo Toxicity In Cancer Patients Older Than 60 Years

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**Tutor:** MD Deepak Mulajker

**Introduction:** Cancer is the leading cause of death worldwide with elderly patients being predominantly affected. There seems to be a bias against administering chemotherapy to elderly patients with fewer elderly patients receiving chemotherapy as compared to their stage matched younger patients because of concerns about their capacity to endure treatment.

**Aim of the study:** To make personalized treatment decisions and to anticipate serious adverse effects, a toxicity prediction tool that can be computed at the bedside is the need of the hour. This well-validated score has not been tested in the Indian population. So we decided to test the same score in our patients and try to correlate the score with the observed toxicity.

**Material and methods:** Fifty consecutive elderly patients (age >60) with a diagnosis of cancer and scheduled for chemotherapy were recruited. These patients were evaluated using the geriatric assessment tool which is based on –functional, nutritional and psychological status. After that patient's pre-therapy chemo-toxicity score or geriatric score was calculated using a published well validated tool that consisted of 11 pre-chemotherapy variables—geriatric assessment questions, laboratory values, tumor characteristics, planned treatment, and age. The patients were followed from the beginning to the end of 6 cycles of their chemotherapy regimen. Toxicities were noted after each clinical encounter by using the NCI-CTCAE, version 3.0.25.

**Results:** The mean score on activities of daily living was 66.7, comorbidity score was 2.7, the psychological scale was 63.8, the social-activity scale was 54.3 and social-support scale was 64.1. The mean pre-therapy toxicity score is 7.24 according to the toxicity calculator. At least one grade 3 to 5 toxicity occurred in 30% of the patients (66% of grade 3, 20% of grade 4, 13.3% of grade 5). The correlation between the predicted score and observed graded toxicity score by Pearson's scale (alpha = 0.05) was 0.63.

**Conclusions:** The prediction model is easy to use, thus increasing the feasibility of incorporation in daily practice. It may enable oncologists to allows oncologists to better assess the risk/benefit ratio and to adjust the treatment accordingly.

## Early Integration Of Adjunctive Palliative Care Alongside Regular Chemotherapy In Breast Cancer Patients

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**Tutor:** Dr. TVSVGK Tilak

**Introduction:** Breast cancer is the most common malignancy among women in India, accounting for 14% of all cancers. Palliative care is an interdisciplinary service and an overall approach to care that improves quality of life and alleviates suffering for those living with serious illness, regardless of prognosis. However, in India, less than 2% of those who need it receive it and hence palliative care is frequently evoked for patients only at the end-of-life. To the best of our knowledge, this is the first study to explore patient outcomes associated with early implementation of Palliative care in cancer patients in India.

**Aim od the study:** To investigate whether adjunctive Palliative Care improves patient outcomes in Quality of Life and Symptom Management among breast cancer patients undergoing chemotherapy.

**Methodology:** Adult female Stage 3 breast cancer patients (n=50) were recruited from two treatment programs: Group A (n=25) received Chemotherapy only recruited from the oncology department of a tertiary care centre Group B (n=25) received Chemotherapy and adjunctive Palliative Care recruited from a Palliative Care centre. All patients were chosen with similar gender, stage of cancer, chemotherapy regimen (standard), socioeconomic status and geographic location. Quality of Life was measured using EQ- 5D tool (Mobility, Self-care, Usual activities, Pain, Anxiety/depression). Symptom burden was assessed using Edmonton Symptom Assessment Scale (ESAS) (Pain, Tiredness, Nausea, Depression, Anxiety, Drowsiness, Appetite, Well-being, Shortness of breath). Data was analysed using SPSS (USA) 23.0.

**Results:** Age: - Group A (mean)= 51.63, SD = 6.36 Group B (mean)= 49.7, SD = 8.55 t (21) = 2.17, p= 0.67. Hence, statistically insignificant group differences in patient age. EQ5D scores: - Group A (mean) = 16.33, SD = 4.84 Group B (mean) = 21.77, SD = 2.38 t (27) = 2.1, p = 0.003. Difference in EQ5D scores is statistically significant. p values were significant for the following domains- Self Care, Usual activities, Pain/ discomfort, Depression. ESAS scores: - Group A (mean) = 44.58, SD = 15.30 Group B (mean) = 22.67, SD = 11.22 t (36) =2.09, p = 0.0005. Difference in ESAS scores is statistically significant p values were significant for- Pain, Tiredness, Depression, Anxiety, Appetite and Well-being.

**Conclusion:** Our study demonstrates that patient outcomes significantly improved in patients with stage 3 breast cancer when they received concurrent palliative care alongside standard oncologic care, compared to their counterparts who did not receive adjunctive palliative care. Early integration of palliative care into the treatment plans of terminal diseases should therefore be prioritised and sustainable models for efficient and affordable delivery of palliative care should be developed. Keywords: palliative care, cancer, symptom burden, quality of life.



## TP53 72 codon SNP as a new possible prognostic markers of young age, triple negative breast cancer

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**Introduction:** Breast cancer is the most common oncological diagnosis and the leading cause of cancer death in women. It is crucial to get a greater understanding of this disease in order to identify the diagnosis and assign the right treatment quicker. It is known that molecular mechanisms like absence of estrogen and progesteron receptors, Protein Ki-67 overexpression, uPA and PAI concentration, TOP-2A gene amplification is associated with worse prognosis. Lately TP53 single nucleotide polymorphism (SNP) is being investigated in all cancer related fields. Literature suggest that TP53 72 codon SNP could be associated with early emergence of breast cancer and worst prognosis.

**Aim of the study:** The aim of the study is to examine TP53 72 codon SNP in first time breast cancer patients and to analyze correlations between it and breast cancer at young age, worst prognostic and predictive factors molecular factors, overall survival rates.

**Materials and methods:** Information was obtained from electronical case histories of 117 patients who have been diagnosed with breast cancer for the first time 2013-2014 in Lithuania National Cancer Institute. Data about TP53 72 codon SNP in these patients was collected from National Cancer Institute Biobank Database. Using statistical analysis methods looking for correlation between TP53 SNP and clinical and molecular characteristics that could relate to worse prognosis.

**Results:** All 117 patients had their TP53 72 codon tested. 99 (84,6%) of patients had Arg/Pro, 15 (12,8%) had Arg/Arg and 3 (2,6%) had Pro/Pro polymorphism. 9 patients were less than 40 y.o. when they were diagnosed with breast cancer (young breast cancer). Young patients more often had Arg/Arg combination 4/9, which was statistically significant ( $p = 0.0128$ ). Arg/Arg alleles combination also showed significantly bigger numbers of triple negative breast cancer 8/15 patients ( $p = 0,028$ ) Triple negative breast cancer was statistically more common in young patients as well. ( $p = 0.035$ ). Tumour histological grading and lymphatic spread did not correlate with young age or TP53 SNP. 5 year survival was significantly shorter with Arg/Arg combination ( $p = 0.024$ ), patients with Young age cancer had similar 5 year survival rate with other age groups.

**Conclusions:** TP53 72 codone SNP Arg/Arg mutation is associated with Young women breast cancer. This combination of alleles as well as Young age showed to increase a possibility of triple negative breast cancer. Patients with this SNP had worst 5 years survival rates. Investigation of TP53 72 codon SNP could be useful to assess the risk of early breast cancer with worst molecular characteristics.

## **GTF2A1 may be a potential biomarker distinguishing breast cancer of various hormonal status- in silico analysis**

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**Introduction:** Breast cancer is the most common cancer in women not only in developing countries, but also in the developed world. Moreover, its incidence is still increasing due to elongated life expectancy and urbanization. Early detection can significantly improve patients survival and prognosis. Additionally, determining whether a tumor has progesterone or estrogen receptors helps to evaluate person's risk of recurrence and establish proper treatment. Therefore, it is worth to attempt discovering new biomarkers for early breast cancer detection.

**Aim of the study:** The purpose of our research was to investigate different signalling pathways in breast cancer patients via in silico analyses to find novel potential biomarkers.

**Materials and methods:** The analysis was conducted by the means of available bioinformatical tools and on-line databases. The data needed to perform our research was acquired from The Cancer Genome Atlas. To investigate breast cancer patients profiles more deeply, we implemented weighted gene co-expression network analysis (WGCNA). Module-trait relationships of breast cancer patients revealed the most significant genes combined into modules which were chosen for further generation of heatmaps, focusing on estrogen and progesterone receptors status. Finally, for visualization of molecular interaction networks and integration with gene expression profiles, Cytoscape software was used and top genes were selected.

**Results:** In module-trait relationships, we observed that one module was evidently related to both estrogen and progesterone statuses. Consequently, significantly expressed genes presented on heatmaps lead to formation of network indicating GTF2A1 as a top hub gene established through WGCNA-embedded algorithm. Along with GTF2A1, we extracted its first line of protein-protein interactors: NF1, EP300, CARM1, CREBBP, ATF2 and GATA3. It is worth to notice, that GTF2A1 plays an important role in transcriptional activation, as do all of the genes mentioned above.

**Conclusions:** To conclude, our preliminary in silico analyses indicate that GTF2A1 may be a potential biomarker in breast cancer. Additionally, it could enable us to distinguish between positive or negative estrogen and progesterone statuses in patients. GTF2A1 and associated genes may have impact on altering transcription in breast cancer development and progression.

**Do Laboratory Findings In Admission to Pediatric Oncology And Hematology Ward Collate With Diagnoses And Relapse Probability? A Retrospective Data-analysis.**

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**Tutor:** MD PhD Małgorzata Sawicka-Żukowska

**Introduction:** Diagnostic evaluation of suspected malignancies in children shows various laboratory findings and physical symptoms. These tests are nonspecific and mimic other self-limiting disorders rather than lead to the diagnosis of cancer. Aim of the study: The aim of the study was to check if there is a correlation between diagnoses, relapse probability and blood levels of various laboratory parameters in children with different types of malignancies.

**Materials&Methods:** A retrospective analysis of medical records of 161 patients (73 female and 88 male) in admission to the Department of Pediatrics, Oncology and Hematology of The Medical University of Bialystok Children's Clinical Hospital with suspected diagnoses of leukemia (111 patients), lymphoma (20 patients), solid tumor (20 patients) and sarcoma (10 patients). The first measurements of white blood cell count, D-dimer, ferritin, lactate dehydrogenase, uric acid, reticulocyte count and platelet count were set together with diagnoses established in further diagnostics and the history of relapse of each patient.

**Results:** We found significantly higher concentrations of white blood cell count, D-dimer, ferritin and activity of lactate dehydrogenase in the group diagnosed with leukemia. Results show that there is a correlation between blood levels of white blood cell count, D-dimer, ferritin, lactate dehydrogenase, uric acid, platelet count and a diagnosis of childhood malignancy ( $p < 0,05$ ). Reticulocyte count does not correlate with a diagnosis of childhood malignancy ( $p > 0,05$ ). There is a strong positive correlation between uric acid and lactate dehydrogenase activity ( $p < 0,05$ ) and a negative correlation between lactate dehydrogenase activity and platelet count ( $p < 0,05$ ). Increased activity of LDH in admission correlates significantly with relapse in the entire study group.

**Conclusions:** Non-specific markers of neoplastic growth seem to be significant in the diagnostic process of childhood malignancies. Their predictive value should be checked on more numerous populations.

## Quality of sexual life during and after the treatment of breast and cervical cancer

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**Introduction:** Gynecological diseases like breast and cervical cancer have a serious impact on women's self-esteem, and likely on their sexuality. The process of dealing with cancer treatment and its outcome can have negative impact in both physical and psychic life zones.

**Aim the study:** The study focuses on psycho-social effects of breast and cervical cancer on women's sexual life quality.

**Methods:** Study group consisted of 74 women. 24 were during and 22 after breast cancer treatment. 16 patients were during and 12 after cervical cancer treatment. Questionnaire used in the study contained questions about respondents' satisfaction, quality and changes in sexual intercourse, partners' behavior, physical fitness and self-acceptance due to cancer treatment.

**Results:** Over half (54%) of surveyed women state being unsatisfied with their sex life. Nearly the same amount of respondents (53%) experienced decreased interest to have sex, while 2/3 of patients (69%) admitted the loss of their femininity caused by the illness/treatment. The disease had negative impact on sexual life in 54% of respondents. Main causes were surgical treatment (53%) and lower self-esteem (50%). Over 1/3 of patients (36%) noticed changes in their partners' attitude towards intimate relations, the most common were: lack of will to have sexual intercourse (41%) and embarrassment (37%). One in two patients was not satisfied with her physical fitness (52%) and 36% did not enjoy their appearance.

**Conclusions:** Breast and cervical cancer treatment affect many aspects of sexuality because of its complexity and sometimes serious side effects. It has a large impact on patients' mentality which might be the major cause of problems in the intimate zone. Therefore psychological assistance should be emphasized for this group of patients.

## Long-term Changes on Metabolism and Quality of Life in Young Adult Survivors of Childhood Acute Lymphoblastic Leukemia

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**Introduction:** Young adult survivors of childhood acute lymphoblastic leukemia (ALL) are at higher risk of early cardiovascular events, changes in metabolism and have a different health-related quality of life. Young survivors have an important impact on continuing morbidity and early mortality because of chronic health conditions, severe or life-threatening complications during adulthood.

**Aim of the study** The aim of the study was to evaluate early signs of metabolic syndrome, cardiovascular risks, and quality of life in young adult ALL survivors treated in Children's Clinical University Hospital during childhood or adolescent period until 18 years of age.

**Materials and Methods:** A prospective observational study was performed between the 2017-2020 year. Physical health, blood parameters of survivors of childhood ALL (n=41) were compared with age- and sex- matched healthy volunteers (n=40). Quality of life was estimated between survivors (n=41) and age-matched controls (n=78) by questionnaire. Survivors were 18-36 years old and disease-free for at least 5 years. The study was approved by the Ethics Committee of Riga Stradiņš University and analysed by Microsoft Excel and SPSS 23.

**Results:** Clinical characteristics of survivors showed adverse blood biochemical variations - unfavourable lipid profiles, a higher level of total cholesterol, LDL-cholesterol and triglycerides, glucose, insulin. Survivors have a higher prevalence of insulin resistance, hypertension, metabolic syndrome (3 out of 5 criteria). Statistically significant differences comparing survivors and controls was founded analyzing: HDL-cholesterol (p=0,02), non-HDL cholesterol (p=0,03), R-Cholesterol (p=0,01). Comparing metabolic derangements of both groups including BMI categories most of them (49% of survivors, n=20) was in normal-healthy weight group, pre-obese or overweight are 24% (n=10) of survivors, moderately obese are 17% (n=7), severely and very severely obese are 5% (n=2) survivors in each category. Significant correlation was found between hs-CRP and weight, waistline, BMI, DBP, HDL-cholesterol. Hs-CRP have a sensitivity to metabolic syndrome. Among survivors self-rating are higher between controls in question about the quality of life (p=0,028), happiness (p<0,001), feeling of control over events in their life (p=0,032), satisfaction about their lives (p<0,001) and feeling of utility (p=0,002). Nevertheless, survivors feel uncomfortable about their body (p<0,01) and feel ashamed of their bodies (p=0,008).

**Conclusions:** Long-term outcomes result in higher risks of developing cardiovascular diseases in young adult survivors. Childhood cancer is an emotional period in a patient's life that affects not only physical health but also has impact on emotional status, social and psychological life components in adulthood. Our group data shows stronger emotional health than controls. This group of patients needs closer follow-up with the screening of metabolic syndrome components, unfavourable lifestyle factors, and personalized health screening recommendations.

## Comparison of anti-tumor properties of temozolomide and new hydrazone-aziridine derivatives – in vitro analysis with the use of glioblastoma-derived cell culture

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**Introduction:** Glioblastoma (GB) is one of the most aggressive and drug-resistant brain tumors. Current chemotherapy methods, including temozolomide (TMZ) treatment, are not effective enough as they often lead to disease relapse. The studies available to date show that hydrazone-aziridine derivatives have anti-tumor potential and may be considered as putative therapeutics.

**Aim of Study** Analysis of anti-tumor properties of new hydrazone-aziridine derivative compounds and comparison of their effectiveness to temozolomide routinely used in GB therapy.

**Methods and Material:** The in vitro model of GB-derived cell culture were used to study cytotoxicity potential of 6 newly synthesized hydrazone-aziridine derivatives provided by dr Adam Pieczonka from Department of Organic and Applied Chemistry, University of Łódź. The viability of GB-cells after treatment was assessed with the use of CCK8 kit. Then, for the cells treated with the most effective compounds - ARA12, ARA13, flow cytometric analysis of apoptosis / necrosis was performed using the Annexin V-FITC Apoptosis Detection Kit. Additionally, flow cytometry method was applied to detect autophagy process by means of Autophagy Detection Kit and to monitor a cell cycle with the use of EZCell™ Cell Cycle Analysis Kit. The output were compared to the results obtained for GB-cells treated with TMZ. Results The viability analysis of GB cells treated with the examined compounds for 48h, showed that ARA12 and ARA13 presented the most cytotoxic potential. Based on the CCK8 results, the IC50 values were assessed (110 µg/ml for ARA12 and 170 µg/ml for ARA13). The analysis of apoptosis / necrosis of GB cells, demonstrated that ARA12 and ARA13 give a similar effect, slightly stronger than that of TMZ, however, the percentage of apoptotic cells did not exceed 20%. Additionally, treatment with ARA12 and ARA13 resulted in intensification of autophagy in GB cells, a process detected also after TMZ application. The examined compounds influence the cell cycle also, that may result in reduction of proliferation potential of GB cells.

**Conclusions:** The obtained results demonstrated anti-tumor properties of ARA12 and ARA13, as compounds able to decrease viability of GB cells and confirmed therapeutic potential of hydrazone-aziridine derivatives. However, further research is needed to elucidate mechanism of their cytotoxic activity and analyse their influence on healthy cells.

## Acute pancreatitis as a complication of treatment in children with acute lymphoblastic leukemia

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**Introduction:** The acute lymphoblastic leukemia (ALL) treatment is frequently burdened with many complications including acute pancreatitis (AP). AP was defined by at least two criteria: elevated pancreatic enzymes, abdominal pain or vomiting and changes in abdominal ultrasound. According to the INSPPIRE criteria serum amylase and/or lipase values  $\geq 3$  upper limits of normal were considered as significantly elevated. Aim of the study The purpose of this study was to determine frequency and potential clinical risk factors of AP in children with ALL receiving chemotherapy.

**Materials and methods:** Retrospective study was conducted by reviewing the data of 81 patients (age 1-16 at the time of diagnosis) from the Department of Pediatric, Oncology and Hematology from 2016 to 2020 according to the ALLIC 2009 and AIEOP 2017 protocols. Patients with a different type of leukemia (mature B-cell leukemia, lineage switch to AML, acute bilineage leukemia), incomplete information about treatment or insufficient time of therapy were excluded from the analysis (7 patients). AP was defined according to the INSPPIRE criteria. Collected data included patient gender, age, type of protocol, type of leukemia, risk group, lipase and amylase levels, allergic reaction to L-asparaginase and occurrence of diabetes, pancreatic cysts and leukemia relapse. During statistical analysis Pearson's chi-squared test was used to assess statistical significance. Odds ratio was used in order to quantify the strength of the association between two events.

**Results:** 81 patients were taken for analysis (F-35/M-46) - 67 patients with B cell ALL and 11 patients with T cell ALL. 42 children were treated with ALLIC BFM 2009 and 39 children with AIEOP BFM ALL 2017. The median age at diagnosis was 5 years. Of 81 children 5 patients had ALL recurrence. Eight patients died during treatment, 2 of them had AP. Twelve patients developed acute pancreatitis (15%). Of 12 children with AP the majority - 9 were girls ( $p=0.03$ ; OR=4.39; 95%CI: 1.09-17.68) and 3 were boys. From HR group, which consists of 12 children, 3 patients developed AP. 6 patients who had AP were treated with ALLIC BFM 2009 and 6 patients were treated with AIEOP BFM ALL 2017. Ten (83%) episodes of AP occurred during protocol I, the rest during protocol II (8.3%) and HR2 treatment block (8.3%). Allergic reaction to L-asparaginase occurred in 27 children, 3 of them also developed AP. Of 69 patients, who did not develop AP, 8 had elevated at least one pancreatic enzyme level. The maximum elevation noted, in this group of 8, was 924 U/l for lipase and 362 U/l for amylase. Elevation of lipase was observed mainly between 25-35 (32.5) day and amylase between 20-40 (33.3) day of the I protocol which was related to administration of L-asparaginase.

**Conclusions:** The study shows that acute pancreatitis was observed more frequently in girls and occurred mainly in the remission induction phase of chemotherapy.

**Analysis of the response to hepatitis B vaccination versus clinical features in a single-centre cohort of 153 children with acute lymphoblastic leukemia.**

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**Introduction:** Acute lymphoblastic leukemia (ALL) is the most common pediatric malignancy. The cure rates of ALL are high but the treatment is toxic. This is well established that cancer-and treatment associated depression of the immune system is a major contributor to severe infections that lead to significant morbidity and mortality. While the role of agranulocytosis is well understood, little is known about specific humoral (antibody-mediated) immunity. We used the level of anti-HBs antibodies as a surrogate marker of humoral immunity in children with ALL (children in Poland are obligatorily vaccinated against HBV with 4 doses of Engerix or Euvax-B since 1994). We are aware of the shortcomings of this surrogate marker but no other antibody-related marker is measured at diagnosis.

**Aim of study:** The investigation of the association between initial anti-HBs level and clinicopathological features in children with ALL. **Material and methods:** In our study we included 153 patients treated for ALL in the Department of Pediatrics, Oncology and Hematology, Medical University of Lodz in the period 2004-2021. The data points included basic demographic data, immunophenotype, cytogenetics, hematological parameters, risk group. Normality of distribution was analyzed by Shapiro-Wilk test. For comparison of groups we used Mann-Whitney U test and Kruskal-Wallis test. To assess correlations we used Spearman's rank test. Statistical analysis was performed using Statistica 13.1.

**Results:** No patients had features of HBV infection at the initiation or throughout the treatment, which point to the effectiveness of the immunization. The policy in our Department is to re-vaccinate children with cancer with anti-HBs below 100 mIU/ml for up to three times to reach anti-HBs>100 mIU/ml. While the median initial anti-HBs concentration in the whole cohort was 60.0 mIU/ml (interquartile range, IQR: 13.6-242.0), the anti-HBs antibody levels were widely varied and associated with patient immunophenotype. The median of anti-HBs level at the treatment initiation was 66.5 mIU/ml (IQR: 18.8-292.0) for patients with B-ALL (n=134) vs 20.0 (IQR: 8.0-56.4) for patients with T-ALL (n=19), p=0.009. There is no difference in the latest results of anti-HBs levels, p=0.662. Lower anti-HBs levels in patients with T-ALL may be to some extent explained by a higher age of T-ALL patients (median 7.3 years, IQR: 3.4-12.3) vs B-ALL (median 4.4, IQR: 2.7-8.1), p=0.034, and thus longer interval since immunization. Alternatively, lower anti-HBs levels in patients with T-ALL may point to a deeper humoral immunity defect in patients with T-ALL.

**Conclusions:** This would be of great interest to assay other more direct measures of B-cell function in pediatric ALL. Unfortunately major immunoglobulin types are not routinely measured at diagnosis and also there are many acute situations impacting on their levels in such unstable patients. The contribution of humoral immunity deficiency to ALL related infectious morbidity is not clear.



## Targeted therapy in paediatric patients with haematological malignancies - case series

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**Introduction:** Haematological malignancies are among the most common cancer types in paediatric population. They are usually curable with standard methods involving chemotherapy. Targeted drugs are possible therapeutic options for patients whose cancer does not respond to conventional treatment. Moreover, some of them are known to cause less severe side effects in comparison to chemotherapy.

**Aim of the study:** The aim of the study was to investigate the types of targeted drugs and the reasons for administering them in children with haematological malignancies, as well as to assess the effects of targeted therapy in observed patients.

**Material and methods:** The study was a retrospective analysis of the medical history of paediatric patients diagnosed with leukaemia or lymphoma. All children were treated at the Department of Paediatrics, Oncology and Haematology of Medical University of Lodz between 2010 and 2021 and received targeted therapy including immunotherapy. The analysis involved 14 patients who were divided into 3 groups according to the diagnosis. The most numerous group was represented by patients with acute lymphoblastic leukaemia (ALL) - 8 children (5 with B-ALL; 3 with T-ALL). The second group of patients, with Hodgkin's lymphoma (HL), was equal to 4 individuals. The last 2 patients were diagnosed with acute myeloid leukaemia (AML) including one with transformation from myelodysplastic syndrome (MDS) RAEB-T to AML.

**Results:** All children initially received conventional treatment - chemo- or radiotherapy. Lack of remission after standard methods and relapse of the disease were the main reasons why targeted therapy was introduced. ALL patients were mostly treated with Bortezomib (6 patients), but Blinatumomab, Venetoclax, Rituximab and Imatinib were used too, as half of this group received more than one targeted drug. HL and AML patients were given Brentuximab and Venetoclax respectively. 10 children (71.4%) received a graft at some point of therapy, 4 of whom underwent it twice. Others either did not achieve remission or did not have indications for this procedure. Recurrence was observed in 12 patients (85.7%) and occurred more than once in 3 of them. To date, 6 children (42.9%) died due to infections or complications after transplantation. 4 of the remaining 8 patients are still under treatment, meanwhile 4 are under follow-up care after completing the therapy.

**Conclusions:** Paediatric patients with resistant or recurrent haematological malignancies are very difficult to treat. Targeted therapy increases the chance of curing them, however, it is not always effective, as these children are debilitated after previous intensive chemotherapy and therefore, prone to complications. Targeted drugs are going to be included in protocols at earlier stages of treatment, which may improve therapeutic outcomes for these patients.

## Effects of Atorvastatin on the Efficacy of Electroporation and Calcium Electrochemotherapy

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**Introduction:** Most of the effort aiming to increase the efficacy of electrochemotherapy (ECT) is currently focused on the modification of the pulse parameters. However, this study presents a novel approach, in which atorvastatin was used to modulate the membranes' fluidity by decreasing the biosynthesis of cholesterol.

**Aim of the study:** This study aimed to evaluate the effects and safety of atorvastatin on the calcium electroporation in cancer cells (CaEP).

**Material and methods:** The study was performed on the steroidogenic cell lines – A375 (melanotic melanoma), MDA-MB231 (breast adenocarcinoma) and DU 145 (prostate adenocarcinoma). The cells underwent electrochemotherapy with 5 mM calcium chloride after 48 h preincubation with 50 nM atorvastatin. The effects of atorvastatin on the cholesterol content and thus the cell membrane permeability was assessed. Following, the cytotoxicity, clone forming properties and total protein level were examined. Besides, due to the impact of cholesterol on the expression and stability of raft-allocated proteins, we have examined the effects of the therapy on both E- and N-cadherin expression. All the experimental data was supported with molecular dynamics studies.

**Results:** Molecular dynamics studies showed that with the decreasing cholesterol content, the membrane patch becomes more permeable. Pore properties are different under high and low electroporation voltage. Atorvastatin decreases the total cholesterol in the cell, but the cells preincubated with atorvastatin are less permeable in low voltages range, which is related to the high level of actin reorganization. Atorvastatin preincubation does not affect the expression of E- nor N-cadherin after ECT with calcium.

**Conclusions:** To overcome the unfavourable effects of atorvastatin on the efficacy of low-voltage EP of the cancer cells, the process should be combined with the chemotherapeutic and the applied electric field should be amplified.

## **Tie2 expressing monocytes and their clinical value in chronic lymphocytic leukemia**

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**Introduction:** Physiologically, Tie2 expressing monocytes (TEMs) represent from 2% to 7% of all mononuclear cells. During some conditions, such as cancers, their level can be significantly increased. As such, TEMs were identified as a potential prognostic factor in several solid tumors. Despite that, they are insufficiently characterized in hematological malignancies, such as chronic lymphocytic leukemia (CLL). CLL, the most common hematological cancer of adult age, is characterized by the accumulation and clonal proliferation of neoplastic B cells. The course of disease varies, with often asymptomatic beginning. Our knowledge about the relationship between the level of TEMs and clinical status of the patients remains poor and as such, we decided to look upon that subject. Aim of the study The aim of our study was to investigate the clinical significance of TEMs, identified as CD14+CD16+Tie2+, in CLL patients.

**Materials and methods:** The study involved 104 patients diagnosed with CLL and 21 healthy volunteers. Collected blood samples were stained with anti-human CD202b (Tie2/Tek), anti-human CD14, anti-human CD16, anti-human CD-38 and anti-human ZAP-70 antibodies. Flow cytometry has been performed. Results were analyzed using Statistica 13. Using ROC curves we determined the most significant cut-off value of TEMs. We established the optimum threshold for the percentage of TEMs associated with ZAP-70 above 20% to be 14.82%. Using that threshold patients were divided into TEM-high (>14.82%) and TEM-low (<14.82%) groups.

**Results:** We have found out that most of the Rai 0 patients (59,6%) were TEM-low. The majority of TEM-low patients (75,4%) were ZAP-70 negative or CD-38 negative. In the group of TEM-high patients, males were most prevalent (70,2%). In TEM-low group we noticed significantly lower WBC, lymphocyte and monocyte count than in TEM-high group ( $p < 0.01$ ). In TEM-high group, the percentage of ZAP-70 or CD-38 positive cells was significantly higher than in TEM-low ( $p < 0.001$ ). In TEM-high group majority (59.6%) patients required therapy, compared to majority (75.4%) patients in TEM-low group not requiring therapy during observation period. Median time to treatment (TTT) in the group of TEM-low patients was significantly higher than in the group of TEM-high patients (48 months versus 29 months, respectively).

**Conclusions:** We determined TEMs to be a biomarker of TTT with their level correlating with worse clinical status of the patient. Further studies are required to confirm our observations.

## Single-cell expression profiling of lung cancer cells reveals pathways associated with native resistance to KRAS-G12C inhibitors

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**Tutors:** Prof. Wojciech Fendler

**Introduction:** Lung cancer is the second most common carcinoma. Its very poor 5-year survival rate of 20.5% makes it responsible for the highest number of cancer-related deaths. The most important factor contributing to dismal prognosis is a relatively late time of diagnosis – 40% of patients are diagnosed at stage IV, when radical surgery is impossible. It raises an urgent need for the development of new pharmacological treatment strategies. About 13.8% of Non-Small Cell Lung Cancers harbor a KRAS G12C mutation. One of the recent advances in drug development was the introduction of a KRAS-G12C inhibitor (KRASi). Unfortunately, after initial widespread regression following treatment with KRASi, lung cancer cells resume proliferation.

**Aim of the study:** The aim of this project is to characterize the cells resistant to a novel KRASi - ARS1620 using published single-cell transcriptome profiling data, laying theoretical foundations for research focused on overcoming the KRASi resistance. Materials and methods Single-cell transcriptome profiling data were obtained from a publicly available GEO repository (GSE137912). In the experiment, three lung cancer cell lines with KRAS-G12C (H358, H2122, SW1573) were treated with ARS1620. The transcriptome was profiled at 4 timepoints: before ARS1620 administration and after 4, 24, and 72 hours. The data were subjected to standard quality control procedures. Subsequent analysis steps included experimental data integration, regressing out confounding variables, dimensionality reduction, unsupervised clustering using Louvain method, differential expression testing (UMW test with BH correction), Gene Set Enrichment Analysis and Enrichment Map exploration. All steps were performed in R language with Seurat package or dedicated software. **Results:** We defined cells that featured MKI67 expression above the 90th percentile in each timepoint as KRASi-resistant. After the exploratory analysis, we have identified a cluster with highest (30%) percentage of highly proliferating KRASi-resistant cells and relatively high MKI67 expression (consistent across timepoints). Differential expression analysis between cells in this cluster and remaining cells from baseline revealed 2568 significantly differently expressed genes. GSEA using Gene Ontology Biological Pathways and showed 160 cellular pathways significantly enriched in KRASi-resistant compared to KRASi-sensitive cells, that included ones related to transmembrane import, microtubule activity and tricarboxylic acid metabolism.

**Conclusions:** The analysis performed in our project has produced a transcriptome-based characterization of KRASi resistant lung cancer cells at single-cell resolution. The processes associated with innate resistance to ARS1620 indicate increased metabolic activity of such cells.

# Investigation Of Prognostic Biomarkers In Chronic Lymphocytic Leukemia

László Tamás

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**Presenting author:** László Tamás

**Tutors:** PhD Bödör Csaba; MD Nagy Ákos

**Introduction:** Over the past decade, the management of chronic lymphocytic leukemia (CLL) has undergone profound changes. Along with the dynamic development of molecular and cytogenetic assays and the emergence of new targeted therapies, several new prognostic and predictive biomarkers have been discovered. Among these, the mutational status of the TP53 gene and the immunoglobulin heavy chain variable region (IGHV) are considered to be the most important ones.

**Aim of the study:** Our aim was to investigate the distribution of prognostic biomarkers in a real-world Hungarian CLL cohort, with special regards to biomarkers with predictive value considering new targeted therapies.

**Materials and methods:** Serial blood, bone marrow and lymph node samples were collected from 1394 CLL patients from 28 hematology units in Hungary. The separation of peripheral mononuclear cells was performed using Ficoll density gradient centrifugation, followed by the isolation of genomic DNA using column-based extraction systems. The IGHV mutation status was determined by conventional Sanger sequencing, while the presence of the TP53 mutation was determined using bidirectional Sanger sequencing or next-generation sequencing methods. Fluorescent in situ hybridization was used to identify cytogenetic abnormalities.

**Results:** While the IGHV mutation status was determined in all cases ( $n = 1394$ ), the presence of TP53 deficiency was examined in 1073 and the deletion of the long arm of chromosome 1 (del11q) in 69 cases. Upon IGHV analysis, 53% of the tested samples turned out to be non-mutant (IGHV-U), 42% were mutant (IGHV-M), and further 5% were borderline (IGHV-B) CLL. Patients harboring TP53 deficiency were associated with IGHV-U CLL in 67% (range: 108/160) of the cases, while IGHV-U status was present in 52% (480/913) of cases with intact TP53. In our study, del11q was detected in 20 cases, while other cytogenetic abnormalities were identified in 12 cases.

**Conclusions:** The non-mutant form of IGHV is more common, and more frequently associated with TP53 deficiency in our real-world CLL population. Compared to international data, our cohort presented with an increased number of IGHV-U and TP53 dysfunction, presumably due to the higher proportion of patients in need of treatment and less favorable prognosis.

## Identification of genetic predisposition to childhood lymphomas – preliminary study

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**Introduction:** Approximately 10% of malignancies occur in carriers of germline mutations predisposing to cancer. Its identification facilitates treatment modification, cancer prevention with early detection of secondary malignancies, as well as genetic counseling for relatives.

**Aim of the study:** The primary aim of this study is to find genetic predisposition to lymphoma in selected families in which at least two relatives are affected by lymphomas.

**Material and methods:** The study group comprised 21 lymphoma patients from 13 families, who met the following inclusion criteria: (1) patients with positive family history (at least two family members in the first or second-line affected by lymphoma, at least one <40 years old), (2) concomitant defects, (3) at least 2 malignancies in past medical history (at least one lymphoma), (4) rare subtypes of the lymphomas. The germinal DNA was analyzed using the whole-exome sequencing approach. The obtained variants were filtered with the usage of algorithms based on their pathogenicity and their association with phenotype.

**Results:** The most frequent inclusion criteria were: positive family history (n=17, 81%), concomitant defects (n=4, 19%) and rare subtypes of the lymphomas (n=1, 5%). We reported following concomitant defects: immunodeficiencies (n=2, 10%), previous thrombocytopenia (n=1, 5%), and vitiligo (n=1, 5%). Performed whole exome sequencing analysis of 7 families revealed following variants, which may predispose to the development of childhood lymphoma: CXCR4 (NM\_003467.2:c.1012dup; p.Ser338PhefsTer6; het), LCK (NM\_005356.5:c.1176C>G; p.Asn392Lys; het), PMS2(NM\_000535:c.1296delC; p.Asn432LysfsTer16; hom), DDX41 (NM\_016222.4:c.299-3C>T; het), and PALB2 (NM\_024675.4:c.110G>A; p.Arg37His, het).

**Conclusions:** The whole-exome sequencing approach facilitates the identification of patients with germline predisposition to develop childhood lymphoma.

## **Second allo-HSCT due to relapsed AML - inter-transplant correlations of laboratory tests and their impact on remission time**

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**Presenting author:** Anna Lis

**Tutor:** MD PhD Karolina Chromik

**Introduction:** Acute myeloid leukemia (AML) is a serious neoplasm of the haematopoietic system. One of the most effective treatment remains allogeneic hematopoietic stem cell transplantation (allo-HSCT). Despite the higher success rate of this procedure in recent years, disease relapse is still often encountered. One solution can be a second allo-HSCT, however a durable remission usually cannot be achieved and further investigation of different risk factors is required.

**Aim of the study:** The aim of the study was to investigate the correlation between the results of laboratory tests and the time of remission, and to compare the results obtained during the first and second allo-HSCT performed due to AML.

**Material and methods:** The study group consisted of 25 patients (16 females and 9 males) who underwent two procedures of allo-HSCT, with an average age of 45,5 (24-68) years at the time of first diagnosis. They were retrospectively analysed at the base of their medical histories.

**Results:** Amongst lab test results, the significant correlation appears between bilirubin level and time to relapse (0.43;  $p < 0.05$ ) as well as GGTP and time to relapse (-0.58;  $p < 0.05$ ). Furthermore, there is a correlation between GGTP levels after the first and second allo-HSCT (0.48;  $p = 0.15$ ). Otherwise, the correlation between other parameters (e.g., complete blood test, creatinine) and time to relapse is statistically insignificant, as well as mortality and time to relapse.

**Conclusions:** Our results may suggest that the lower the level of GGTP is (therefore the better function of the liver), the more positive is the outcome of allo-HSCT. Moreover, if the GGTP level is elevated during the first allo-HSCT, it is also raised during the second one. Another conclusion is that higher bilirubin levels did not impact graft taking. This can be explained by frequent blood transfusions and increased red blood cell rotation. Further investigation of other risk factors that influence the outcome of allo-HSCT, especially the second one, is needed.

## Identification of Molecular Pathway of Keratin 8 and its Clinical Significance in Lung Adenocarcinoma - in silico study.

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**Presenting author:** Aleksandra Podwysocka

**Tutors:** M.Sc. Damian Kołat, M.Sc. Żaneta Kałuzińska

**Introduction:** Lung adenocarcinoma (LUAD) is one of the three subtypes of non-small cell lung cancer (NSCLC). LUAD mostly derives from the mucosal glands and despite the fact that its main risk factor is smoking tobacco, it is the most common type of lung cancer diagnosed in people who do not smoke. Keratin 8 (KRT8) is a gene coding type II basic intermediate filament protein which plays key role in cellular structural integrity and it is involved in important cellular processes like differentiation, mitosis and apoptosis. High KRT8 expression is correlated with poor prognosis for lung adenocarcinoma patients but its involvement in the development of lung adenocarcinoma is not fully discovered.

**Aim of the study:** Identification of the key pathways and hub genes related with overexpression and downregulation of keratin 8 (KRT8) in patients with lung adenocarcinoma by bioinformatics tools.

**Material and Methods:** Expression data and clinical annotation was downloaded from Genomic Data Analysis Center (GDAC) Firehose. Dataset was divided into two groups low and high expression according to the median expression value of KRT8 and Gene Set Enrichment Analyses (GSEA) was performed. Genes with False Discovery Rate <25% was collected and the molecular interaction network was visualized by Cytoscape software. Survival analysis and Pearson correlations was achieved by Gene Expression Profiling Interactive Analysis 2 (GEPIA2) repository.

**Results:** Low KRT8 expression is negatively correlated to expression of Protein Tyrosine Phosphatase Receptor Type C (PTPRC) which is a regulator of T- and B-cell antigen receptor signaling. Greater survival and disease-free progression of patients with this expression alteration can be related to better recognition of cancer cells by immune system. High KRT8 expression is positively correlated to periplakin (PPL) and keratin 6A, 7, 17, 18, 19, 20, 80 genes expression. It can be related to keratin's participation in cytoskeleton construction and periplakin's cytoskeletal linker functions which enable connection between intermediate filaments to actin, microtubules and cell adhesion junctions allowing attachment of the cytoskeleton to the cell membrane.

**Conclusions:** These interesting findings can be used as introduction to further in vitro or clinical investigation according to promising preliminary study.



## Hairdressers Against Melanoma

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**Presenting author:** Gabriela Frącz

**Tutor:** MD PhD Magdalena Żychowska, Prof. Adam Reich

**Introduction:** Melanoma is a malignant neoplasm of the skin which consists of neuroectodermal melanocytic cells and mainly affects people who have the fair skin phototype, with light hair and eyes. Although it is relatively rare in Poland, in recent years there has been a significant increase of melanoma cases in the world. It is caused by frequent and excessive exposure to natural and artificial UV radiation, especially in exposed parts of the body. The most common location of melanoma in men is the trunk and in women the lower limbs. However, melanoma of the head and neck area is quite high in both sexes. The scalp is an area of the body invisible to the patient, as it is often covered by hair, so the changes that present themselves in this location are not quickly recognized.

**AIM OF THE STUDY** The objective of this study is to verify the general knowledge of malignant melanoma among hairdressers and to ascertain the frequency of lessons that focus on detecting neoplastic changes of the scalp in hairdressing schools and trainings.

**Methods:** The survey was conducted at the turn of 2020, in both online and paper formats. It consisted of 35 questions about the individual completing the questionnaire, as well as detailed questions about their general knowledge regarding malignant melanoma. These results allowed us to create a research group, notice dependencies in the answers and draw conclusions about the questions asked.

**Results** Most hairdressers look at the scalp of their clients, they associate the characteristics of melanoma, but almost half of them are unsure of their assumptions. One in every three hairdressers is unaware that melanoma is a malignant neoplasm, and slightly more than half of respondents discussed the topic of neoplastic changes in hairdressing schools. One in every five hairdressers participated in the hairdressing course during which the topic of melanoma was considered, although over 80% of hairdressers would like to learn more about it. Hairstylists are aware that melanoma can appear on the scalp, but only about 15% of them have heard of a clinically proven neoplasm in this location.

**Conclusions:** Hairdressers knowledge about scalp melanoma is extremely important because they are the "first link" in recognizing suspicious changes in this area, and their ability to react quickly and provide necessary information to their client can significantly expedite the diagnosis. Thus implementing appropriate treatment and improving prognosis. Hairdressing schools should place greater emphasis on transferring knowledge about neoplastic lesions of the scalp, as the incidence of melanoma increases, so should this vigilance take place at the very beginning of education. This also applies to hairdressing training which is currently the main form of acquiring hairdressing certifications, where the topic of melanoma is rarely discussed. Greater awareness and some kind of cooperation between hairdressers and doctors can save someone's life.

## Identification of GP Referral Patterns in which Malignant Melanomas were Referred as Non-Urgent

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**Tutor:** Richard Motley

**Introduction:** Cutaneous malignant melanoma is the deadliest form of skin cancer, thus early detection and prompt referral is pivotal to improve prognosis. A recent audit has revealed that ~50% of GPs refer melanomas as “Routine” as opposed to “Urgent Suspected Cancers” (USC), potentially resulting in late management. We aimed to identify reasons why GPs are discouraged from using the USC referral route for clinically obvious melanomas.

**Aim of this study** was therefore: to identify common reasons why GPs are discouraged from using the USC referral route for clinically obvious melanoma, to emphasize the importance of making accurate referrals and to offer recommendations on how to develop a high index of suspicion for melanoma in primary care.

**Material and methods:** Analysis of all “routine” referrals sent by GPs through Teledermatology between August 2017 and July 2018 was carried out using the Welsh Clinical Portal. Questionnaires were sent to these GPs for enquiry.

**Results:** 42% of melanomas (n=120) were referred routinely by GPs. From the 15 GP responses received, the consensus was that because referrals are reviewed, and if needed, re-prioritised within two days by a Consultant Dermatologist, the referral priority (Routine, Urgent or USC) chosen is given minimal consideration. Additionally, some GPs lacked the confidence to suspect malignancy in difficult-to-identify lesions (especially nodular melanomas). Overall, using the routine channel has no effect on the outcome of the referral as both referral routes are given equal priority. Malfunctions in the referral system, however, have resulted in a referral backlog thus forcing USC referrals to be reviewed as priority. Consequently, routine referrals were reviewed twenty days later than usual, potentially delaying urgent management.

**Conclusions:** Discovering and addressing common reasons why GPs are likely to refer melanomas non-urgently and helping educate them about the different melanoma subtypes is necessary to guarantee undelayed management in secondary care. Various recommendations are suggested to help facilitate this including organizing regular teaching sessions for GPs by Dermatologists where concerns can be addressed.

**Anticancer properties of amygdalin, examined on SH-SY5Y cancer cell line and danio rerio embryo graft cancer model**

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Nowadays, the incidence of cancer is increasing drastically by increasing human exposure to carcinogens. Numerous pharmacological studies around the world have confirmed the anti-cancer effect of many herbal medicines. These include amygdalin (AMY), which is a glycoside found in common quince and seeds of fruit trees such as apricot, cherry and peach. Beyond 40 years ago AMY was banned and passed to quackery, but nowadays, with the development of molecular science, we can study its real anticancer properties. Especially investigating the impact of AMY on cancer growth in vivo using animal's embryo models and its molecular activity in vitro with cancer cells lines. For the experiment neuroblastoma xenograft embryo of danio rerio, and SH-SY5Y cancer cell lines were used. Concentration of AMY used as follows: 0,5%, 1%, 2%, 3%, 4%, 5%, 7,5%, 10%, both on embryos and cell culture compared to healthy equivalents. Observation of cell lines was conducted for 24, 48 and 72h, while fishes were observed to the 5th day. Outcomes of experiments show decreased level of tumor growth, both in cell line and in fish embryo, opposite to healthy equivalents where AMY has no damaging effect. Dose of AMY was compared and results show no toxicity effect and no impact for viability of fishes and cell culture. AMY has anticancer properties confirmed by experiment. AMY decreased growth of cancer, its malignancy and simultaneously is safe for embryo development. Based on papers and future experiments, AMY could be a good cancer medicine used in target curation.

## **OPHTHALMOLOGY AND OPTOMETRY**

**COORDINATORS:** Oliwia Kwaśniewska, Andrzej Weber

**JURY:**

Prof. Wojciech Omulecki MD PhD

Michał Wilczyński MD PhD

## **Assessment of ocular symptoms in patients diagnosed with COVID-19 - analysis of correlation with the severity of systemic disease**

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**Tutor:** Prof. Anna Machalińska

**Introduction:** The new SARS-CoV-2 coronavirus causing the COVID-19 disease is both an important clinical problem and a huge challenge for modern medicine. Since the onset of the pandemic, over 122 million confirmed infections and over 2.7 million deaths have been reported. Although the epidemiology, etiology and clinical characteristics of COVID-19 have recently been described, still little is known of its' ocular manifestations. However, the eye may play a potential role in virus transmission.

**Aim of the study:** To evaluate the occurrence of ocular symptoms and detection of SARS-CoV-2 in tears in relationship with systemic symptoms, and disease stage in patients diagnosed with COVID-19.

**Material and methods:** A total of 199 patients with positive results of qRT-PCR test for SARS-CoV-2 viremia were recruited at the Emergency Room of the Unified Hospital. Written informed consent to participate in the study was obtained in all individuals. Consequently, all patients answered an ophthalmological questionnaire via telephone. Six original questions specified the type, severity and time of ocular symptoms occurrence. In addition, the interview was extended with a set of 12 questions of epidemiology and systemic symptoms allowing the assessment of the advancement of COVID-19. Conjunctival swabs for SARS-CoV-2 in all patients were taken.

**Results:** In total, 88 women (44%) and 111 men (56%) were enrolled for the study. The mean age was  $54.9 \pm 15.21$  years. 41 (20.6%) patients reported ocular symptoms. The dominant ocular manifestations were lacrimation - 16 (39%) patients, eye pain - 11 (26.8%) and burning sensation – 10 (24.4%). Moreover, in 16 (8%) patients positive PCR result of conjunctival swab was noted. Additionally, 3 of them declared ocular symptoms. Positive PCR smear from the conjunctival sac was more common in men ( $p=0.008$ ). In 95% of patients with ocular symptoms eye problems started within 7 days prior to admission to the hospital ( $p<0.0000$ ). Interestingly, hospitalization was more common in patients with ocular manifestations (75.6%;  $p=0.039$ ). A trend towards a higher incidence of ischemic heart disease and hypercholesterolemia was observed in patients with ocular symptoms. Patients reporting ocular disturbances were more likely to develop fever ( $p=0.004$ ), dyspnea ( $p=0.003$ ), cough ( $p<0.000$ ), chest pain ( $p<0.000$ ), headache ( $p=0.0004$ ), diarrhea ( $p<0.000$ ) and pneumonia ( $p<0.000$ ).

**Conclusions:** In the analyzed group, every 5th patient with COVID-19 reported ocular symptoms, which were more common in patients with more severe systemic disease or requiring hospitalization. In most patients, the ocular symptoms appear before the onset of systemic symptoms. Despite the low prevalence of SARS-CoV-2 virus in tears, there is a potential risk of transmission through contact with conjunctival secretions.

## **Catechin extract effect on high intraocular pressure**

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**Presenting author:** Kornelijus Gasiunas

**Tutor:** MD Saulius Galgauskas

**Introduction:** The experiment investigating green tea effect on intraocular pressure changes was made. It has shown that green tea could reduce eye pressure, but it wasn't clear if catechins are the most important part of the tea to cause this effect. That's why we have made another experiment to check this dependence.

**Aim of the study:** To find out if high IOP could be lowered by catechin extracts statistically significantly

**Methods:** The experiment included 28 young volunteer with increased intraocular pressure. It was held between 12pm. and 2pm. Two extract capsules with different amount of catechins – 1. Low in catechin (160 mg of catechins) and 2. High in catechin (320 mg of catechins) were used in the experiment. Participants were divided into three groups. Low catechin extract group 10 subjects, high catechin extract group 10 subjects, control group 8 subjects. IOP was measured with the Icare tonometer before and 30min, 1h, 1,5h, 2h after the consumption of each extract. Results were analyzed using IBM SPSS and Microsoft Excell programs. Statistical confidence level  $p < 0.05$ .

**Results:** Basal mean IOP was: GT group  $22,3 \pm 2,06$  mmHg, EGCG group  $22,25 \pm 2,26$  mmHg, control group  $20 \pm 2,56$  mmHg. After 30 min in GT extract group and control group IOP changes were not statistically significant: GT group  $0,6 \pm 1,65$  mmHg, control group  $0,67 \pm 3,28$  mmHg, in EGCG group IOP has changed significantly  $2,35 \pm 2,47$  mmHg. After 1 h in GT group IOP changes were not statistically significant  $0,8 \pm 1,78$  mmHg, but in the EGCG group it has changed significantly –  $3,15 \pm 2,08$  mmHg. After 1,5 and 2 hours IOP decrease was significant in the groups of both extracts: respectively GT group  $1,65 \pm 1,18$  mmHg and  $2,75 \pm 1,46$  mmHg, EGCG group  $2,65 \pm 2,2$  mmHg and  $2,35 \pm 2,3$  mmHg, in control group after 1, 1,5 and 2 hours no significant changes were seen.

**Conclusion:** This study shows that high intraocular pressure can be lowered with catechin extracts statistically significantly. Extracts that are high in catechin are more potent than extracts that are low in catechin.

## Ophthalmic complications of pregnancy among diabetic women

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**Tutor:** MD PhD Joanna Ciszewska

**Introduction:** Pregnancy among women with Diabetes Mellitus (DM) is an interdisciplinary challenge for physicians of diverse specialties, as it increases the risk of potentially irreversible complications. That includes vision loss due to diabetic retinopathy, which radically decreases the patients' quality of life.

**Aim of study:** The aim of this study was to assess the prevalence of and the knowledge about ophthalmic complications among diabetic women during pregnancy.

**Material and methods:** The study group consisted of 68 women aged 22-50, who filled out an online questionnaire. The questions regarded the most recent pregnancy. The inclusion criteria (IC) were: women with DM (type 1, type 2, MODY), who are or have been pregnant. 22 of the replies have been disregarded due to incompatibility with the IC. The results were analyzed with a spreadsheet.

**Results:** Among the respondents, 67% of women suffered from DM type 2, 22% from DM type 1 and 7% from DM MODY. 87% of women were aware, that pregnancy could influence their vision, but only 41% were referred to an ophthalmologist by their obstetrician-gynaecologist (OB-GYN). The majority of responders (77,9%) was not informed by their OB-GYN about the risk of possible new ophthalmic complications, or worsening of the current ones. The most common ophthalmic symptom reported by the patients was blurred vision. After labor, 13% of women suffered long term vision impairment.

**Conclusions:** Pregnant, diabetic women require ophthalmologic care and should be referred to an ophthalmology specialist. Additionally, they should be informed by the OB-GYN about the risks of pregnancy in their condition, so that this awareness encourages them to seek treatment if any ophthalmic symptoms occur.

## Retrospective Analysis Of The Impacts Of Treatment Regimens On The Progression And Prognosis Of Diabetic Retinopathy And Visual Acuity In Trakya University School Of Medicine

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**Tutor:** MD Rûveyde Garip

**Aim of The Study:** The aim of this study is to retrospectively analyze the impacts of treatment regimens on prognosis and progression of diabetic retinopathy and visual acuity.

**Materials and Methods:** Initially, 798 eyes from 399 patients with the diagnosis of DR met the inclusion criteria. Demographic data such as age and gender, accompanying systemic comorbidities (such as hypertension, diabetic nephropathy), the type of diabetes mellitus (type 1 or type 2), the usage of oral anti-diabetic agents or insulin injection, and initial and following clinical findings were obtained from the medical records of the patients. All patients underwent a complete ophthalmologic examination at each visit including best-corrected visual acuity (BCVA) determined by Snellen chart, anterior segment biomicroscopic examination, intraocular pressure (IOP) measurement with Goldmann applanation tonometer, and detailed fundus examination obtained with 78-diopters non-contact lens. The collected data were analyzed statistically by using descriptive statistical measures, Chi-square test, One-sample Kolmogorov-Smirnov test and Independent Sample t-test in IBM SPSS version 23.0.00. P-value of <0.05 was considered to be statistically significant.

**Results:** 798 eyes from 399 patients with the diagnosis of DR were retrospectively analyzed. Two hundred and thirty-two (58.4%) patients were female, and 166 (41.6%) patients were male. Initial visual acuities were  $0.32 \pm 0.37$  LogMAR units (range; from 3 to 0 LogMAR units) in the right eyes and  $0.32 \pm 0.36$  LogMAR units (range; from 3 to 0 LogMAR units) in the left eyes. Twenty-five (6.2%) patients had a progression from NPDR to PDR. The mean progression duration was  $37.6 \pm 43.1$  months (range; from 3 months to 168 months). Patients with PDR progression had no difference in terms of cataract surgery, gender, and hypertension existence than the ones who didn't experience PDR progression ( $p=0.146$ ,  $p=0.802$ ,  $p=0.272$ , respectively). There was a strong positive correlation in visual acuity between the latest and initial examinations ( $r=0.445$ ,  $p < 0.001$ ). Eventually, we concluded that there was no relation between stability, increase or decrease of visual acuity and the type of diabetes, retinal laser photocoagulation treatment, and the type of intravitreal injection ( $p=0.967$ ,  $p=0.333$ ,  $p=0.132$ , respectively).

**Conclusion:** In conclusion, our study showed that retinal laser photocoagulation treatment, different types of intravitreal injections and cataract surgery had no significant impact on visual acuity prognosis. Furthermore, it was revealed that gender, hypertension presence, and cataract surgery may not have a significant relationship with PDR progression. Further studies are needed to thoroughly reveal the relationship between treatment regimens and the progression and prognosis of the disease.



## Self-assessment vs. objective method evaluation of stereoscopic vision among dentistry students

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**Presenting author:** Anna Nowak

**Tutor:**MD PhD Piotr Maciejewicz

**Introduction:** Stereopsis is the ability to perceive depth and 3-dimensional structures. Stereoscopic vision is essential when performing the precise tasks that are performed daily by dentistry students and professionals. In recent years, augmented and virtual reality are becoming more and more popular in current dental practice as an educational, diagnostic or treatment tool.

**Aim of the study:** Our study aims to compare the subjective assessment of stereoscopic vision with objectively measured stereopsis of 3rd-year dentistry students of the Medical University of Warsaw.

**Materials and methods:** The research compares stereoscopic vision examination and survey, conducted among 126 of 3rd-year dentistry students, 98 women and 28 men. In the survey, we collected the ophthalmology interview and asked about the subjective evaluation of stereopsis during daily activities and performing precise tasks. Additionally, we asked how students coped with the usage of augmented and virtual reality technology. We used the Stereo Fly Test to objectively determine the 3D vision among students. In this test the sensitivity of plates ranges from 40 to 800 seconds of arc; the higher the value, the poorer the stereoscopic vision.

**Results:** 59% of students reported a refractive error, mainly myopia (82%). 8% of students have a medical history of strabismus, in one case concluded with strabismus surgery. In the Stereo Fly Test, 98% of participants were able to detect the depth difference in 400 seconds of arch, 90% in 200 seconds of arch, 80% in 100 and 55% in 40. Three students did not demonstrate any stereoscopic vision. On the contrary, 96% of students subjectively assessed their stereoscopic vision as very good or good in the survey. 57% of students used augmented and virtual reality, of which 97% rated the experience as good or very good.

**Conclusions:** In conclusion, the self-assessment of stereoscopic vision did not correlate with the objective examination of stereopsis. In major cases, the incomplete stereoscopic vision did not affect the precise tasks performing or augmented and virtual reality technology usage by 3rd-year dentistry students. We assume that the stereoscopic vision deficits could be compensated by previous, repetitive experience with the above-mentioned activities.

## The circadian pattern of IOP in glaucoma patients

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**Tutor:** Rohit Sharma

**Introduction:** It is well known that intraocular pressure (IOP) shows variation throughout the day. However, the exact pattern of circadian IOP fluctuation in glaucomatous patients remain debatable.

**Aim of the study:** This prospective observational study is to evaluate the 24-hour continuous pattern of IOP changes in patients with glaucoma measured with a contact lens sensor (CLS) and to compare the variation between CLS reading changes and actual IOP changes as measured by tonometry.

**Methods:** The eyes of 24 glaucomatous patients (9 females, 15 males) were examined. In all 24 subjects, the IOP fluctuations were measured continuously for 24 hours with Sensimed Triggerfish® CLS while they carry out their normal activities. The circadian IOP pattern were analysed. The 24-hour period was divided into 8 3-hour time slots (0000-0259, 0300-0559, 0600-0859, 0900-1159, 1200-1459, 1500-1759, 1800-2059, 2100-2359) and the peak and trough values of IOP with their corresponding time slots were recorded. The coefficient variation of mean average of peak and trough value of CLS data and mean average of actual IOP measured using Goldmann applanation tonometry (GAT) in clinics were calculated and compared.

**Results:** All patients successfully completed the 24-hour measurement of IOP with CLS. The mean age was 69.83 (SD: 7.8) years. 15 (62.5%) were left eyes and 9 (37.5%) were right. 13 subjects (54.1%) showed early morning peak in their circadian IOP monitoring with CLS. 12 (50%) subjects have their peak IOP at 0600-0859 period, mean peak value was 319.6 mVeq (SD: 174.6). 18 (75%) subjects have their trough IOP at 2100-2359 period, mean trough value was -113.3 mVeq (SD: 123.1). The mean peak and trough average of CLS data was 216.4 mVeq (SD: 77.6) whilst the mean average of IOP value was 16.6 mmHg (SD: 3.02). The coefficient of variation of CLS value was 35.9%. The coefficient of variation of IOP measured by GAT was 18.2%.

**Conclusions:** The most common circadian IOP pattern was early morning acrophase. Most glaucomatous patients had highest IOP in the morning which coincides with the circadian cortisol peak. These peaks can be missed by contemporary practice of IOP measurement during clinic hours. The coefficient variation of CLS value was higher than the IOP value from GAT, which suggests that CLS is able to pick up wider variation of IOP than normal daytime IOP measurements in clinics.

## The Ophthalmic Emergency Department On New Year's Day

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**Tutor:** MD PhD Joanna Ciszewska

**Introduction:** New Year's Day is a special day in terms of trauma, resulting from lighting up fireworks at midnight, popping champagne bottles and alcohol abuse. Due to the festivities, injuries of the eye are quite common. Patients who suffer from accidents are referred to the ophthalmic emergency department (OED) on duty.

**Aim of the study:** To analyze the reasons for referrals of patients to the OED. The Department of Ophthalmology of the Warsaw Medical University was the only trauma referral OED on duty during New Year's Day 2020.

**Material and methods:** The prospective study included patients referred to the ophthalmology department after preliminary assessment at the general emergency department. Answers to a previously prepared questionnaire were collected from patients right after the evaluation performed by the ophthalmologist on duty.

**Results:** Total of 13 patients were admitted to the OED on New Year's Day, aged from 27 to 64 years old. Six (46.15%) patients suffered from conditions unrelated to New Year specific activities. In 7 cases (53.84%) referral was connected to trauma by fireworks. Five of them consumed an average of 4.17 standard units of alcohol (median = 2.5) before the accident. Four (57.14%) of them described themselves as sober during the accident. Two patients (28.57%) were brought in by ambulance, three (42.86%) showed up at OED within 90 minutes after the event and the remaining two (28.57%) arrived 14 hours later. Only one person wore protective glasses.

**Conclusions:** More than half of the patients referred to the OED ophthalmologist at New Year's Day suffered from trauma caused by fireworks. Most of them consumed alcohol prior to trauma, while only one person undertook protective measure when using fireworks. It is important to keep on reminding the public about the dangers associated with shooting fireworks after drinking in order to avoid such accidents.

## The safety and validity of contact lens sensor in measuring IOP in glaucoma patients

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Tutor: Rohit Sharma

**Introduction:** Lowering intraocular pressure (IOP) is the only evidence-based treatment for glaucoma. Current clinical practice only measures single IOP reading in clinic. Sensimed Triggerfish® contact lens sensor (CLS), a relatively new device, is designed to monitor 24-hour intraocular pressure (IOP). Currently, the safety, tolerability and validity of continuous 24-hour measurement of IOP in glaucomatous patients with a CLS remains controversial.

**Aim of the study:** Our study is to evaluate the safety of CLS in patients with glaucoma and whether the CLS measurement can be correlated to IOP measured using Goldmann applanation tonometry (GAT).

**Methods:** This was an observational single-facility study. Only patients diagnosed with glaucoma were recruited from glaucoma clinics. 24 voluntary patients (9 females, 15 males) underwent 24-hour continuous measurement of IOP with a Triggerfish® CLS. Case notes and clinic letters were reviewed to identify any objective and subjective reports of eye symptoms after the usage of CLS.

IOP were measured immediately before and after CLS usage using GAT by ophthalmologists. We then compared the changes of IOP measurements (end-initial IOP in mVeq) from CLS and changes of IOP (end-initial IOP in mmHg) from GAT among the 24 patients to see was there any correlation.

**Results:** All patients successfully completed the 24-hour measurement of IOP with CLS. The mean age was 69.83 (SD: 7.8). The rate of reporting of discomfort to GP or any emergency admission was 0%. At the 3-week follow up clinic, there was no objective and subjective report of eye symptoms such as ocular pain and blurred vision. We found that the Pearson correlation coefficient between the difference of IOP measurement from CLS and GAT was  $r=-0.173$  ( $p=0.43$ ), which represented a weak negative correlation.

**Conclusions:** Our study showed that IOP measurement with 24-hour CLS were well tolerated in glaucoma patients. There were no permanent complications and side effects reported so we conclude that continuous measurement of IOP with Triggerfish CLS in glaucomatous patients is relatively safe. Our results showed a weak correlation between Triggerfish data changes and IOP measurements using the GAT. CLS therefore can demonstrate the diurnal changes of IOP pattern but cannot replace GAT for IOP measurement.

## The symptoms of eye dryness in students of Warsaw universities during the SARS-CoV-2 pandemic

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**Tutor:** MD PhD Piotr Maciejewicz

**Introduction:** The dry eye syndrome is a condition affecting tears and the ocular surface. The symptoms include dryness, burning, sandy or gritty sensation, eye redness, sensitivity to light or blurred vision. Eye surface is protected by the tear film, distributed over the globe during blinking. Prolonged use of screens (television, computers, tablets and phones) reduces the rate of blinking, which can lead to dryness. Due to the SARS-CoV-2 pandemic, people started spending more time with electronic devices.

**Aim of the study:** This study aims to check whether time spent in front of screens affects the symptoms of eye dryness.

**Material and methods:** The study group consisted of 323 students (251 female and 69 male) of universities located in Warsaw aged 18-25. The participants were asked to fill out an online questionnaire, which included questions about time spent in front of screens now and in the previous year. The OSDI (Ocular Surface Disease Index) questionnaire has been used to ask about the symptoms of eye dryness now and a year ago.

**Results:** The analysis revealed that the time spent with electronic devices this year compared to last year increased in 94.43% (305/323) cases, including: in 53.87% (174/323) by 3 to 6 h, in 24.15% (78/323) by 1 to 3h and in 16.4% (53/323) over 6h. The number of people for whom the value of answers to questions from the OSDI questionnaire, comparing the current and the previous year, increased in at least one question by at least one point, was 94.42% (288/305). The overall numerical point increase was as follows: from 1 to 4 points in 37.15% (107/288), from 5 to 8 points in 45.14% (130/288) and from 9 to 12 points in 17.71% (51/288) of participants. The average point increase in total, depending on the extension of the time spent in front of the screen, amounted to: for an extension from 1 to 3h: 4.9, from 3 to 6h: 5.77 and for above 6h: 6.06, while for people without additional risk factors: for the extension of 1-3h: 4.35, 3-6h: 5.84, and over 6h: 5.56. The highest number of respondents showed a point increase in the question of soreness, burning and eye irritation - 70.83% (204/288), and the smallest in the question about eye problems while driving at night - 23.61% (68/288). The mean point increase in participants using glasses or lenses was 5.67 (148/288 people), and in other 5.53 (140 people).

**Conclusions:** In the vast majority of respondents, the time spent with electronic devices increased. Most of them reported the appearance or worsening of dry eye symptoms. The amount of extra hours in front of a screen is likely to correlate with the severity of dry eye symptoms.

## Validation of Lithuanian Version of Ocular Surface Disease Index Questionnaire

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**Tutor:** Prof. Ingrida Janulevičienė

**Introduction:** Administration of questionnaires regarding health-related quality of life evaluation is a crucial step of the diagnostic process. Ocular Surface Disease Index (OSDI) is a worldwide accepted questionnaire for patients experiencing dry eye symptoms.

**Aim of the study:** The purpose of this study is to complete the validation of Lithuanian Version of OSDI and make it available in Lithuanian ophthalmologists' daily work and research while encountering dry eye disease (DED) patients.

**Methods:** The translation process of original OSDI to Lithuanian language was made by the Mapi Research Trust according to the accepted rules for questionnaire validation. All included DED patients completed the Lithuanian Version of OSDI. Inclusion criteria: native Lithuanian speakers of 18 years or older, who had previously diagnosed DED and gave consent to participate in the study. Patients with ocular infection or vision less than 6/60 in Snellen chart were excluded. Randomly selected subjects were requested to refill the translated OSDI one month later for test-retest reliability evaluation. All participants underwent a comprehensive ophthalmological and specific examination for ocular dryness with non-anesthetic Schirmer's test, tear break up time (TBUT) test, fluorescein staining of the cornea. In a randomized manner, a part of subjects was selected to complete Visual Function Questionnaire (VFQ-25) which was compared to Lithuanian Version of OSDI.

**Results:** The study included 90 DED patients of which 75 (83.3%) were female and 15 (16.7%) were male. The age mean (SD) was 65,87 ( $\pm 17$ ). The Cronbach's alpha coefficient for the questionnaire was 0.87 and for the three subscales it was 0.78, 0.69 and 0.71, respectively. The translated OSDI and its' subscales showed good internal consistency. A significant correlation was found for test-retest reliability ( $n=35$ ). Correlations between Lithuanian Version of OSDI and VFQ-25 ( $n=53$ ) were moderate to strong. According to OSDI results, normal eyes were detected in 2 (2,2%) cases, mild dry eye disease in 27 (30%) cases, 16 (17,8%) participants had moderate DED and 45 (50%) had severe DED. A weak negative correlation was found between Schirmer's test (mm) and OSDI total score (Spearman's correlation coefficient -0.31,  $p=0.045$ ) and between OSDI total score and TBUT (Spearman's correlation coefficient -0.41,  $p=0.027$ ).

**Conclusions:** Completed Lithuanian Version of OSDI corresponded well with previously diagnosed DED. The questionnaire and its' subscales showed good internal consistency and test-retest reliability. Statistically significant correlations between translated OSDI and VFQ-25 demonstrated good construct validity. Therefore, this study provided proof that Lithuanian Version of OSDI is valid to use for DED evaluation in Lithuanian patients.

## **ORTHOPEDICS**

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## **Description of the pathologies of the sacral bone of various etiology**

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**Presenting author:** Hubert Szyller

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**Aim of study:** Due to its embryological origin and constituting an important point in the architecture of the nervous system, the sacrum is a frequent object of pathologies related to a direct disturbance of the union of constituent vertebrae or symptoms of chronic infections. The main aim of study was to precisely analyse most frequent changes of bone structure and predict possible symptoms of those deformations.

**Methods:** Bones used in research come from different historical periods. All of them were cleaned and precisely described with use of histological preparations. The results were compared with medical literature in order to find possible dysfunctions.

**Results:** Most of embriological deformations touch sacral crists, what changes the weight distribution, obturatons of sacral plexus nerves are also possible. Diseases such as tuberculosis or osteoporosis can also breach structure of vertebral column. Another studied pathology is anomalous connection with ilium.

**Conclusion:** Sacral bone pathologies can cause pain symptoms, nerve dysfunction and neuralgia. there are high-risk groups in which tests for sacral bone structure disorders are particularly likely: women in the menopausal period, patients undergoing radiotherapy of the reproductive organs.



## **Does the Posterior Condylar Angle (PCA) affect risk of ACL tear? An MRI based study in 18- 30 years old males.**

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**Introduction:** Injuries of the anterior cruciate ligament (ACL) are very common among both professional and non-professional sportsmen with multiple risk factors described in the literature. The posterior condylar angle (PCA) is a parameter describing the torsion of the distal femur, but to our knowledge it has never been correlated with ACL injuries.

**Aim of the study:** To establish whether the value of the PCA is associated with risk of ACL injury in the population of 18-30 years old males.

**Material and methods:** This is retrospective radiographic study. A priori power analysis with  $\alpha=0.05$  and  $\beta=0.95$  indicated a required sample size of 44 controls and 44 patients with torn ACL. Inclusion criteria were: male sex, age 18-30 and available magnetic resonance (MRI) knee scan. Exclusion criteria were posterior cruciate ligament (PCL) or lateral collateral ligament (LCL) injuries, surgical treatment of femoral condyles and epicondyles, innate dysplastic pathologies of the knee and osteoarthritis. Two lines were created on the axial MRI. First- the posterior condylar line (PCL), which is tangent to the femoral condyles. Second - the surgical transepicondylar axis (sTEA), which links the lateral femoral epicondyle and the sulcus of the medial femoral epicondyle. The PCA was defined as the angle between the sTEA and PCL and two independent raters measured it three times with at least 24 hours between measurements. The PCA in external rotation was given the positive values and in internal rotation - negative values. Secondary analyses were performed to assess whether there is a difference in PCA between patients with isolated ACL injury vs. in ACL injury combined with medial collateral ligament (MCL), medial meniscus (MM) or lateral meniscus (LM) acute injuries. U Mann-Whitney test, t-student independent-samples tests and linear regression model were used to analyze results statistically. P value  $<0.05$  was stated as statistically significant. Intraclass correlation coefficients (ICC) were calculated for intra- and interrater reliabilities.

**Results:** Mean PCA in control group was 1.90, SD=1.25 and did not differ significantly from PCA in study group (mean 1.30, SD=2.49,  $p=0.178$ ). Aside from ACL injuries, 7 patients had acute and 1 had degenerative injuries of MCL. 23 patients had acute and 8 had degenerative injuries of MM. 9 patients had acute and 7 had degenerative injuries of LM. Intrarater ICC were 0.9309 and 0.9281 (excellent) and interrater ICC was 0.8684 (good). Univariate analyses of PCA in isolated ACL injury vs. in ACL combined with acute MCL, MM or LM injury had p values of 0.98, 0.81 and 0.81, respectively. Multivariable analysis assessing combined impact of acute MCL, MM and LM injury had p values of 0.74, 0.42 and 0.87 respectively.

**Conclusions:** PCA value is not associated with acute ACL injuries in the population of 18-30 years old males. PCA is not different between patients with isolated ACL injury compared to ACL injury combined with MCL, MM or LM injury.

## **Outcome of paediatric femoral shaft fractures treated with Titanium Elastic Nailing (TEN).**

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**Background:** Femoral shaft fractures comprise about 1,8 % of all pediatric bone fractures and above 60 % of all femoral bone injuries. Current surgical procedures enclose spica casting, plate fixation, intramedullary nailing (IMN), external fixation, K-wire fixation and titanium elastic nailing (TEN). TENs are becoming the preferred choice of treatment, because of the preponderance of evidence of early union, early mobilization, scar acceptance and high patient satisfaction rate.

**Aim of the study:** To report clinical, and radiographic evaluation of titanium elastic nailing effectiveness in surgical treatment of paediatric femoral shaft fractures. Another objective was to assess procedure-related complications.

**Methods:** A retrospective review was conducted on all patients with femoral shaft fractures treated at University Children's Hospital in Cracow between 2007 and 2020. We included only patients aged between 3 and 17 years that were treated with TENs with a minimum of 6 months follow-up. Femur fractures were categorized into 2 groups: length stable (short oblique, transverse) and length unstable (long oblique, comminuted, spiral). Plain AP radiographs were analysed to determine type of fracture, location and side of fracture, post-surgery complications, varus or valgus limb angulations, time to union and leg length discrepancies. Moreover, data on patient's age, weight, etiology of injury, duration of hospital stay, duration of surgery, injury to surgery time, and clinical evaluation based on Flynn's criteria were examined.

**Results:** 140 patients meeting research criteria (94 men, 46 women) out of 461 patients with femoral shaft fracture were studied. The mean age was  $8\pm 2$  (3 to 17) years and mean follow-up was  $26.2\pm 16.3$  (7 to 74) months. The mean weight was  $31\pm 9.2$  (12.5 to 71) kg. A total of 86/146 (59%) fractures were length unstable and 60/146 (41%) were length stable. We found 81 midshaft fractures, 37 proximal-third fractures and 22 distal-third fractures. All except 3 fractures presented radiological confirmation of union within first 8-15 weeks. 3 cases of delayed union were observed in this study. Full-weight bearing was possible in the mean of 10.1 weeks. A total of 55 complications occurred : soft tissue irritation (16), varus or valgus malalignment (18), limb length discrepancies (15), skin infection due to protruding nail (4), refractures (2). Clinical evaluation according to Flynn's criteria demonstrated 74% (104) excellent results, 21% (29) satisfactory results, 5% (7) poor results.

**Conclusions:** TEN is a mini-invasive, surgeon friendly tool, which can be successfully used in the treatment of both stable and unstable femoral shaft fractures in children. This surgical procedure is free from major, life-threatening complications. Most of minor complications can be minimized by optimal fracture reduction and optimal burial of protruding nail.

## **An analysis of self-reported injuries in Polish offshore sailors.**

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**Introduction:** Offshore sailors are prone to frequent orthopaedic injuries, which may occur during recreational as well as professional voyages and also during races and regattas. Experience and weather conditions may influence their frequency. Even professional sailors who know that prevention includes f.e. the strategy “one hand for you, one hand for the ship”, may suffer from accidental injury. Understanding mechanisms and risk factors for these injuries may allow to introduce measures reducing their occurrence in the future.

**Aim of the study:** The first aim of the study was to determine the epidemiology of injuries sustained during offshore sailing and to assess factors describing given cruises. The second aim was to statistically assess whether some of these factors increased risk of sustaining an injury.

**Material and Methods:** 568 respondents answered the online questionnaire shared on online groups and pages gathering Polish sailors. Inclusion criteria were sailing on offshore waters at least once in 2019. Data on sustained orthopaedic injuries, their frequency, severity, mechanism, location and contributing factors were collected. The survey regarded not only cruises with injuries, but also cruises without. Acquired data were analysed statistically using the following tests: Chi-square, Chi-square with Yates correction, Shapiro-Wilk, Levene, U-Mann Whitney and logistic regression.

**Results:** 568 sailors reported 793 cruises, among which 141 were with injury. The most frequent type of injury was contusion (39.7%), followed by skin lesions and lacerations (19.9%) and joint sprain (9.9%). The injuries most often concerned the hand (28.4%) and foot and ankle (17.7%) and in the majority of cases occurred on midship (31.9%). The top 3 mechanisms of injury were tripping/falling (32.6%), hit by object (19.1%) and injury while using ropes (19.1%). The most common contributing factors reported by sailors were inattention/distraction (33.5%), difficult weather conditions (21.7%) and fatigue/lack of sleep (13.6%). Seasickness was not chosen as a contributing factor by any of the sailors surveyed. Majority of injuries required either no medical intervention or only first aid on the ship (35.6% and 31.3%, respectively). Average number of days spent sailing were 40.27 (SD=44.43) for people who were injured and 32.4 (SD=44.42) for those who weren't ( $p=0.0004$ ). The boatswain position was associated with statistically higher occurrence of injury ( $p=0.0084$ ).

**Conclusion:** Approximately one in five cruises resulted in an injury and they occurred regardless of implemented harness wearing policy and type of rigging. Multifactorial nature of sustained injuries poses a challenge in implementing effective safety measures. There is a need for further studies conducted on a larger group of offshore sailors to better understand sailing injuries, their mechanisms and develop evidence-based prevention strategies.

## **BMI and leg thickness in Total Knee Replacement planning**

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**Introduction:** Total knee arthroplasty (TKA) is regarded as the best treatment option for end-stage osteoarthritis (OA). It is actually one of the most common procedures performed in orthopaedics nowadays. Its success is primarily dependent on surgeon's experience, patients comorbidities, and implants' fitting. This last one is mostly determined by component size. These days body weight of nearly 25% of world population is increased. Part of this group is going to suffer from OA throughout their lives, considering BMI>25 (kg/m<sup>2</sup>) as one of the risk factors. Since overweight or obese patients tend to have larger leg circumference, surgeons could be misled that it is associated with thicker bone and choose a bigger implant size as a result.

**Aim of study:** The purpose of this study was to determine whether the lower limb subcutaneous tissue thickness correlate with TKA femoral or tibial component size and does the BMI level influence patient-reported outcome after surgery.

**Material and methods:** In this prospective study 60 (18 males, 42 females) patients qualified to total knee replacement (TKR) in orthopedic unit were included. Their BMI (29.17 +/- 4.4) was calculated and subcutaneous tissue thickness measured (for femoral region 10cm above the distal femoral condyles surface and for tibial region 10 cm below tibial plateau) with use of X-ray examination in anteroposterior and lateral projection. The size of components used in particular TKR procedure was noted down following the surgery. Patients were assessed by means of WOMAC and KOOS questionnaires at the admission and at the final follow-up, after 12 months (11-13 on average).

**Results:** There was no significant difference in both femoral (p=0.94) and tibial (p=0.48) subcutaneous tissue thickness between groups with different femoral and tibial implant sizes. There was a non-significant positive correlation between BMI and mean change in both total WOMAC (r= -0.024, p=0.85) and KOOS (r= -0.18, p=0.17) scores.

**Conclusions:** The common belief that bone thickness is strictly related with body mass occurs to be false. Surgeons should keep that in mind when choosing implants for knee arthroplasty as it might significantly impact the outcome. BMI level does not affect the clinical outcome after TKR and thus obese patients should not be excluded from the procedure.

**The analysis of injuries and orthopaedic management in polytrauma patients treated in Leszek Giec Upper-Silesian Medical Centre of the Silesian Medical University in Katowice from 2010 to 2019**

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**Introduction:** Multitrauma is defined as an injury involving two or more different body parts, with a condition that at least one of these injuries is life - threatening [1].

**The Aim:** The aim of this study was the analysis of injuries after polytrauma, especially in musculoskeletal system and subsequent treatment.

**Material And Methods:** The analysis covered data on the treatment of 107 patients (69 men, 38 woman) treated in the Department of Orthopaedics and Traumatology in Leszek Giec Upper-Silesian Medical Centre of the Silesian Medical University in Katowice from 2010 to 2019. Data were searched based on code T06 International Classification of Diseases and than were analyzed.

**Results:** Men below 40 years old were most frequently patients who suffered from injuries after polytrauma. The mean age of patient was 39 years. The leading causes of polytrauma were traffic accidents (62,6%, n=67) and falls from height (23,4%, n= 25). Head injuries were diagnosed in 59 (55%) cases, chest injuries in 65 cases (61%) and abdominal injuries in 22 cases (20%). Injuries of musculoskeletal system were present in 55% of all injuries. The most common injuries in musculoskeletal system were fractures of the lower limbs, (38 cases;36%), followed by pelvis fracture 30 patients (29%) and upper limbs fractures 26 (24,3%). 53 patients (49%) required orthopedic surgery, mainly intramedullary stabilization of upper (4,7%) and lower (10,3%) limb. Operative stabilization of pelvis fracture was performed in 8% of all patients.

**Conclusions:** Polytrauma requires surgical treatment in almost half of the cases. Cooperation of many specialists (e.g. trauma surgeons, vascular surgeons, neurosurgeons, orthopedists, anesthesiologist) is essential in the diagnosis and treatment of patients after polytrauma. Maintaining treatment standards is the most important in management of multiple injuries.

## **The impact of the COVID-19 pandemic on polish orthopedics, in particular on the level of stress among orthopedic surgeons and the education process**

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**Tutors:** Prof. Łukasz Kołodziej

**Introduction:** The Coronavirus Disease 2019 – (COVID-19) pandemic has had a significant impact on the healthcare system and medical staff all around the world. The orthopedic units were one of subjects to restrictions and regulations introduced by the government in Poland, which strongly influenced holding planned and emergency treatment.

**Aim of the study:** The aim of conducted research was to assess how the COVID-19 pandemic affected orthopedic wards in the last year, in particular how the level of stress among doctors changed and how the pandemic influenced the quality of doctors' education.

**Material and methods:** An online survey was created (Google Forms) and sent to 273 members of the Polish Society of Orthopedics and Traumatology. The survey contained 51 questions and was divided into main sections: Preparedness, Training, Stress, Reduction, Awareness. A total of 80 responses to the survey were obtained.

**Results:** Most of the respondents indicated that the pandemic negatively affected the quality of training of future orthopedists (69.4%) and that pandemic has had a negative impact on their operating skills (66,7%). Only 38% believe that online education has had a positive impact on their education process. The negative impact of pandemic on education was noticeable especially in the group of young orthopedic surgeons: 0-5 years of work experience ( $p=0,029$ ). Among the respondents, the level of stress increased over the last year from 4.8 to 6.9 ( $p < 0.001$ ). The greatest increase in the level of stress was observed among orthopedists working in country hospitals ( $p=0,03$ ).

**Conclusions:** The COVID-19 pandemic negatively affected the quality of training of orthopedic surgeons and the level of stress. This is a signal that it is necessary to look for solutions to prevent this phenomenon from becoming worse. Hope can be associated with training on cadavers and with the use of virtual reality. The help of psychologists should also be available to doctors and actions should be introduced to reduce the level of stress.

## **Radiological outcome differences in total hip arthroplasty between anterolateral and posterior approach**

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**Introduction:** Total hip arthroplasty (THA), considered the best treatment option for end-stage osteoarthritis (OA), is currently one of the most common procedures performed in orthopaedic surgery. One of the crucial decisions during operation planning is choice of surgical approach, with anterolateral and posterior approaches being the most commonly used. Both of these are characterized by different merits and limitations, including possible differences in placement of the components of the implant.

**Aim of study:** The purpose of this study was to determine whether there are differences in acetabular cup positioning between patients operated using anterolateral and posterior approach.

**Material and methods:** In this prospective randomized study 158 (66 males, 92 females) patients qualified to total hip arthroplasty (THA) in the single orthopedic unit were included. Using X-ray examination in anteroposterior projections several radiological parameters were measured on both pre- and postoperative images: acetabular component's inclination and anteversion along with length of the operated limb and femoral stem angle. Statistical analysis of results was performed. All comparisons were performed between continuous variables in independent groups. Therefore either t-Student test or U Mann-Whitney test were used, according to the normality of distribution examined with Shapiro-Wilk test. Significance level was set at p value below 0.05.

**Results:** Univariate analysis showed significant differences between anterolateral and posterior approaches in anteversion (12.79 vs 15.78,  $p=0.005$ ) and inclination (40.45 vs 36.65,  $p=0.0003$ ). There were no significant differences in length change of the operated limbs and femoral stem angle between groups.

**Conclusions:** Despite ongoing debate, there is still no clear consensus which surgical approach to use to implant an artificial hip prosthesis. Found differences in cup positioning may be connected with greater risk of prosthesis dislocation while using posterior approach, which should be taken into consideration during operation planning.

## **Effect Of Changes In Body Functional Assessment On Injuries In Volleyball**

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**Objectives:** Volleyball is a fast and dynamic sport in which the player's body is subjected to unexpected movements. Injury in any sport means a change in training and competition plan. This is a team sport where the injury of at least one player affects the whole team. Any inaccuracy in the functional condition of the joint can lead to injuries. Epidemiological and clinical studies demonstrate the interdependence of the feet and proximal joints. (Rao, Riskowski, Hannan, 2012). It is proven that feet in the pronation state are considered as a potential risk factor for lower limb overload injuries. (de Groot et al., 2012). By revealing the connection between the functional condition of the whole body and the nature of the injuries, it is possible to develop a plan of preventive measures.

**The aim of this study** is to find out the effect of changes in the functional state of the body on injury risk in volleyball.

**Methods:** Interviews with volleyball team experts. Analysis of data from previous functional evaluations. Questionnaire (history of injuries).

**Results:** According to the team experts observations, injuries in volleyball are more often caused by changes in the functional state of the foot. It all starts with a foot. If there is a wrong gait or unstable foot, it further affects the posture. Changes in posture can affect how stable and accurate a player can perform the movement to reach the ball. Inaccuracies in those movements can cause injuries in the ankle, knee or hip.

**Conclusions:** It is possible that changes in the functional state of the feet may increase trauma in volleyball.



## **Assessment Of Musculoskeletal Disorders in Patients With Thyroid Dysfunction, Diabetes And Obesity**

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**Presenting author:** Nicola Dyrek

**Tutor:** MD PhD Piotr Kocelak

How hormonal changes in particular clinical conditions, such as obesity, thyroid disorders or diabetes, affect the patients' motor system. How individual clinical conditions affect bone turnover and metabolism

Our work is a compendium of information about individual metabolic diseases, including their impact on the locomotor system, as well as their consequences. How a positive energy balance affects the osteoblasts and joints of obese patients. There is an interaction between adipose tissue and bone tissue, which is directly influenced by the hormonal function of adipose tissue.

Studies show that receptors for thyroid hormones TR $\alpha$ 1 and TR $\beta$ 1 are found in platelet chondrocytes, bone marrow stem cells, osteoblasts and osteoclasts, and their expression in osteocytes is questionable. Persons with both type 1 and type 2 diabetes (T1DM, T2DM) have a significantly higher risk of bone fractures compared to persons without diabetes. The reason is not the difference in BMD, BMI or falls. It follows that people with diabetes have reduced resistance to bone fractures. Skeletal homeostasis is associated with insulin sensitivity through a nuclear receptor activated by peroxysome proliferators (PPAR $\gamma$ ). The same posttranslational modifications of PPAR $\gamma$  protein, regulating insulin sensitivity and energy metabolism, are responsible for regulating bone turnover, which allows PPAR $\gamma$  to control the differentiation of cellular components of bone remodeling.

## **The update on scales and questionnaires used to assess cervical spine disorders**

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Musculoskeletal disorders affect 20%–33% of all the global population, and its prevalence is continually increasing. According to the World Health Organisation, persistent neck pain (NP) is currently one of the leading causes of disability. Therefore, the assessment of the effectiveness of treatment methods and severity of the disease is a necessity. However, due to the multiplicity of the clinical assessment tools used and different inconsistent scoring methods between researchers, some inaccuracies may arise. This review article is an up-to-date overview that provides an insight into the scales and questionnaires used to assess cervical spine disorders. We discuss generic outcome measures, i.e. NMQ (Nordic Musculoskeletal Questionnaire) and VAS (Visual Analog Scale) and the tools specific for cervical pains: NDI (Neck Disability Index), NOOS (Neck Outcome Score), NPAD (Neck Pain and Disability Scale), and NPQ (Northwick Park Neck Pain Questionnaire). Each of these measures is presented together with the information about its origin, scoring method, and interpretation. This descriptive review is designed as an introduction to the questionnaires and scales used in the assessment of neck ailments and can serve as a practical guide for beginner clinicians and researchers.

## Subtrochanteric fracture of femur epidemiology in Lithuania in 2011-2019

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**Presenting author:** Ugnė Vaičiulytė

**Tutor:** Prof. Vidmantas Alekna

**Introduction:** Since populations are aging, health problems that are the norm for older adults, such as hip fractures, are becoming increasingly more relevant for health care providers. Subtrochanteric fractures are rare compared to hip fractures, but information on their frequency and burden on the healthcare system is scarce.

**Aim of the study:** To evaluate the epidemiological situation of subtrochanteric femoral fractures in Lithuania from 2011 to 2019.

**Material and methods:** Data on the epidemiological situation of subtrochanteric fractures of femur in 2011-2019 from patients over 40 years of age were obtained from the Institute of Hygiene. A total of 4165 patients with subtrochanteric femoral fracture (SFF) were diagnosed (ICD-10 code S72.2). To select primary cases of SFF recurrent cases and cases diagnosed in primary care institutions, nursing and rehabilitation clinics were not included in further study. Patients were divided into groups by gender as well as age. Statistical analysis was done using Microsoft Excel 2010, R Commander. Differences between results were deemed statistically significant when  $p < 0.05$ .

**Results:** A total of 2165 patients were included in the study from 89 medical institutions in Lithuania, including 1846 women and 957 men (65.86% and 34.14%, respectively), and the gender of 17 individuals was unknown. Mean age was 74.96 years (SD 13.58). When comparing life expectancy and the patient's age at subtrochanteric fracture, it should be noted that they are similar for women (averages 79.9 years and 79.4 years, respectively), but differ for the men by three years (averages 69.5 years and 66.2 years, respectively). Risk of SFF over the age of 40 is 16/100,000 for men and 23/100,000 for women. The duration of hospitalization tends to increase during 2011-2019, but this is not a statistically significant change ( $p > 0.05$ ). For male patients, the frequency of fractures did not depend on the season of the year, but female fractures were more common in the fall and winter seasons ( $p > 0.05$ ). Hospitalization time increases significantly when the patient is older: from 12.17 days in the 50-54 age group to 36.11 days in the older than 85 years patient group ( $p < 0.05$ ). Male hospitalization after fracture was statistically significantly shorter than female (24.59 and 31.40 days, respectively,  $p < 0.05$ ).

**Conclusions:** For women, SFF fractures were twice as common, occurred in older age, and coincided with women's life expectancy. In men, SFF fractures were less common, occurred at a younger age and on average three years earlier than the average life expectancy in men. The number of cases did not depend on the season of the year. Older patients as well as women required longer hospitalization. "

## **PEADIATRICS**

### **COORDINATORS:**

Katarzyna Krawiranda, Michalina Prowotorow

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## The SARS-CoV-2 pandemic impact on the incidence of juvenile idiopathic arthritis

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**Presenting author:** Agnieszka Brzezińska

**Tutor:** MD PhD Violetta Opoka-Winiarska, MD PhD Violetta Opoka-Winiarska

**Introduction:** Juvenile Idiopathic Arthritis (JIA) is a group of heterogeneous, chronic arthritis disorders of yet unknown etiology with onset before the age of 16. Based on the International League of Associations for Rheumatology (ILAR) criteria, JIA can be divided into seven subtypes. The incidence is estimated to be 4 to 16 in 10 000 children in North America and Europe. However, there are concerns that the SARS-CoV-2 pandemic, which appeared in Poland in March 2020, affected the incidence of JIA and access to primary and specialized health care for children with rheumatic diseases. In many cases, the time of diagnosis is the main prognostic aspect of the possible outcome of the treatment for the patient. Hence it is important to take necessary steps towards improvement of diagnosis in that field during COVID-19 pandemic.

**Aim Of The Study:** To investigate whether the COVID-19 pandemic has an impact on the incidence of JIA.

**Materials And Methods:** The data of 87 patients with a new diagnosis of JIA from March 2019 to February 2021 in the Department of Paediatric Pulmonology and Rheumatology in Lublin was analysed. The statistical data processing was performed using Statistica by StatSoft.

**Results:** The study found that from March 2020 to February 2021 (pandemic period) the amount of diagnoses was significantly smaller compared to the period with COVID-19 pandemic from March 2019 to February 2020 (pre pandemic period) with 32 and 55 new cases respectively ( $p < 0,05$ ). The mean period between first symptoms and diagnosis of disease was 5,91 month and 5,08 month respectively, however it did not reach significance. The mean ESR measured at first medical appointment in the pandemic period was higher than in the pre pandemic period and amounted to 42,10 mm/h and 30,24 mm/h, however it did not reach significance. Likewise, the differences in ESR and the differences in the number of affected joints between the first and the last medical appointment in the pandemic and pre pandemic period were not statistically significant. Surprisingly, the mean ESR measured at the last medical appointment was significantly different in both groups and amounted to 22,50 mm/h and 13,93 mm/h respectively ( $p < 0,05$ ).

**Conclusion:** Our preliminary data indicate that the COVID-19 pandemic has not increased the incidence of JIA. The reduction in the incidence of JIA may indicate that isolation from other infections and undefined environmental factors contributes to JIA, which is still a widely studied hypothesis for autoimmune diseases. Another problem is that due to COVID-19 outbreak many patients have difficulties with access to primary and specialized health care, which may delay diagnosis of chronic diseases in children. Majority of these conditions have to be diagnosed early in order for the treatment to have the best possible outcome. We strongly believe that this problem needs to be addressed since it occurs in other fields of medical diagnostics and can have negative implications in the future.

## Comparison of sociodemographic data and functional impairment in patients with Juvenile idiopathic arthritis and acute versus chronic sacroiliitis

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**Presenting author:** Kristīne Kozlova

**Tutor:** MD PhD Zane Dāvidsone, MD Natālija Merkla

**Introduction:** Juvenile idiopathic arthritis (JIA) is a pediatric autoimmune disease that can cause sacroiliitis decreasing quality of life. The incidence of sacroiliitis is rather low and there have been no studies about sociodemographic data and functional impairment in patients with acute or chronic sacroiliitis.

**Aim of the study:** To evaluate and compare sociodemographic data and functional impairment measured by children's health questionnaires (CHAQ) and visual analogue scale (VAS) in patients with JIA and acute versus chronic sacroiliitis.

**Methods:** Medical history of 82 patients over the period of 2014 to 2018 were analyzed in this retrospective study, using Children's Clinical University Hospital database. MS Excel and IBM SPSS Statistics 26.0 were used for data compilation and analysis.

**Results:** Sacroiliitis was radiologically confirmed in 63% (n=52) patients, while 29% (n=24) had no radiological signs of sacroiliitis, and 7% (n=6) had no radiological examination. Two most common types of JIA in 47% and 31% of patients with sacroiliitis were RF-negative polyarthritis (M08.3) and enthesitis-related arthritis (M08.1) with no significant difference between acute and chronic sacroiliitis ( $p=0.869$ ). 73% (n=38) of patients with confirmed sacroiliitis were girls with no significant difference between acute and chronic inflammation (69% vs 73%, respectively;  $p=0.776$ ), only 27% (n=14) were boys. Mean age was 14 years with significant difference between acute and chronic sacroiliitis (13 vs 15 years, respectively;  $p=0.035$ ). Family anamnesis was negative in majority of patients - 55% (n=26), positive in only 40% (n=21) and unknown in 10% (n=5) with no significant differences between acute and chronic sacroiliitis ( $p=0.406$ ). Mean time from the onset of symptoms was 22.2 months, time from confirmation of JIA - 13.2 months, and time from onset of symptoms to diagnosis – 11.5 months with no significant difference between patients with acute and chronic sacroiliitis ( $p>0.5$ ). Mean CHAQ score was 0.521 in patients with acute and 0.280 – with chronic sacroiliitis, however this difference was not statistically significant ( $p=0.110$ ). Mean VAS score was 4.56, but VAS evaluated by doctor – 3.54 with no significant differences between groups.

**Conclusions:** Most commonly acute or chronic sacroiliitis was found in girls with RF-negative polyarthritis or enthesitis-related arthritis and negative family anamnesis. Acute sacroiliitis was more frequently found in younger patients compared to chronic sacroiliitis. Time from the onset of symptoms and JIA diagnosis confirmation in case of chronic sacroiliitis was not significantly longer than in case of acute sacroiliitis. Although mean CHAQ score was higher in patients with acute sacroiliitis, the differences between acute and chronic sacroiliitis in CHAQ and VAS scores were not significant.

## **Interventional Closure of Secundum Type Atrial Septal defect in Children Less Than 3 Years Old in Children's Clinical University Hospital in Riga Within Years 2008-2018**

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**Tutor:** MD PhD Elina Ligere, MD PhD Inga Lāc, MD Valts Ozoliņš,

**Introduction:** The secundum atrial septal defect (ASD) is the 4th most common congenital heart defect with the incidence ~6-8/1000 births. The device closure of hemodynamically significant ASD is usually recommended with body weight more than 15kg (usually age  $\geq$  3 years) to avoid possible complications. Interventional closure of secundum ASD in Children's Clinical University Hospital (CCUH) in Riga, Latvia was commenced in year 2008. All the pediatric patients with congenital heart diseases in Latvia undergo treatment in CCUH so the data represent the pediatric population of our country during the study period.

**Aim of the study** was to analyze all the patients with age less than 3 years undergoing interventional closure of secundum ASD in CCUH during years 2008-2018.

**Material and methods:** This study was an observational retrospective, single center study. We analyzed demographic data, indications for ASD closure, periprocedural data on complications and outcomes and the follow-up data.

**Results:** During the study period of 11 years there were 15 children <3 years old (4 boys, 11 girls), mean age 1.99 years (IQR 1.7-2.2), weight  $11.8 \pm 2.4$  kg undergoing transcatheter ASD closure. 2 patients had multiple ASDs (13.3%). The transcatheter ASD closure was successful in 14 patients (93.3%), but in 1 case there was embolization of the device into pulmonary artery above bifurcation and the patient had surgical evacuation of the device and patch closure of ASD (6.7%). There was no mortality or other serious complications. Immediately after the procedure there were 3 hemodynamically insignificant residual ASD cases (20%). 14 patients (93%) were followed-up in CCUH for  $3.5 \pm 2.8$  years. At the end of follow-up (age  $5.9 \pm 2.9$  years) 1 patient had small residual ASD (7%).

**Conclusions:** Interventional ASD closure in small children (<3 years old and <15kg) can be performed without major risks in small country with small number of patients.

## Basic hematological parameters at diagnosis show striking lineage- and cytogenetics-related disparities in a single-center cohort of 158 children with acute lymphoblastic leukemia.

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**Tutor:** MD PhD Szymon Janczar

**Introduction:** Acute lymphoblastic leukemia (ALL) is the most common pediatric malignancy. Surprisingly, correlations between simple laboratory parameters and clinicopathological features remain to be uncovered.

**Aim of study:** The aim of the study was to investigate the association of the major pediatric ALL subtypes and basic hematological parameters.

**Material and methods:** We analysed 158 patients treated for ALL in the Department of Pediatrics, Oncology and Hematology, Medical University of Lodz in the period 2004-2021. The data points included demographic data, immunophenotype, cytogenetics, haematological parameters measured at diagnosis. Normality of distribution was analyzed by Shapiro-Wilk test. For comparison of groups we used Mann-Whitney U test. Statistical analysis was performed using Statistica 13.1.

**Results:** We compared patients with B-ALL (n=139) vs T-ALL (n=19) and patients with the most frequent cytogenetic alteration in pediatric ALL (i.e. ETV6-RUNX1 fusion, n=22) versus patients without that alteration (n=121), other cytogenetic groups were of low frequency.

The following parameters were significantly lower in patients with B-ALL vs in patients with T-ALL (median [interquartile range, IQR]): Hb (7.7 g/dl [5.6-9.5] vs 10.9 [8.0-12.3],  $p<0.001$ ), Hct (23.2% [17.3-27.7] vs 33.5 [24.1-37.9],  $p<0.001$ ), RBC ( $2.7 \times 10^6/\mu\text{l}$  [2.0-3.3] vs  $3.7$  [2.3-5.0]  $p=0.002$ ), WBC ( $9.4 \times 10^3/\mu\text{l}$  [3.9-24.6] vs  $62.0$  [17.5-148.6],  $p<0.001$ ). The medians of PLT were  $62.0 \times 10^3/\mu\text{l}$  (IQR: 20.0-125.0, B-ALL) and  $93.5$  (IQR: 33.0-200.0, T-ALL),  $p=0.132$ .

In addition, hematological parameters also required lower in patients with ETV6-RUX1 fusion vs in the remaining group (median [IQR]): Hb (5.2 g/dl [4.6-7.3] vs 8.4 [6.5-10.5],  $p<0.001$ ), Hct (16.2% [13.4-22.2] vs 25.2 [20.1-32.1],  $p<0.001$ ), RBC ( $1.9 \times 10^6/\mu\text{l}$  [1.7-2.4] vs  $2.9$  [2.3-3.6],  $p<0.001$ ), PLT ( $32.5 \times 10^3/\mu\text{l}$  [10.5-52.5] vs  $77.0$  [29.0-157.0],  $p<0.001$ ). The median of WBC was  $22.6 \times 10^3/\mu\text{l}$  (IQR: 3.8-83.8) vs  $9.7$  (IQR: 4.2-28.3),  $p=0.219$  in patients with and without ETV6-RUNX1 fusion, respectively.

**Conclusions:** T-ALL patients presented with strikingly higher RBC parameters. The less pronounced anemia in T-ALL children might be related to relatively earlier diagnosis in that disease due to earlier occurrence of symptoms related to bulky disease or organ compromise. Higher median age of patients with T-ALL (7.3 years, IQR: 3.4-12.3 vs 4.4 with B-ALL, IQR: 2.6-8.5,  $p=0.036$ ) may partly explain the difference. The most common and associated with relatively good prognosis t(12;21) cytogenetic subtype (patients with ETV6-RUNX1 fusion) demonstrated significantly lower RBC parameters than the remaining patients. Interestingly the mean platelet count was strikingly lower than in the rest of children. While hemoglobin-related parameters might be partly explained by the association of t(12;21) with younger age, the difference in the degree of thrombocytopenia is more puzzling. Further patient cohorts are required to validate our finding and further understand their significance.



## **Retrospective study of Lyme arthritis among children**

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**Tutor:** MD PhD Violetta Opoka - Winiarska

**Aim of the study:** Lyme disease is an infectious disease, transmitted by ticks of the Ixodus genes. Borrelia burgdorferi spirochetes are etiologic factors. Symptoms of Lyme disease are mostly related to nervous system, heart muscle and joints. Articular Lyme disease rarely occurs in children. Correct and early diagnosis is very important for the successful treatment of the disease. The aim of the study is to describe a clinical picture of Lyme arthritis in children. Method: Patients were identified using code A69.2, which in ICD-10 refers to Lyme disease. The study included 21 pediatric patients with A69.2 diagnosis and clinical symptoms of arthritis. All of them were hospitalized over the period 2007-2021 in Department of Pediatric Pulmonology and Rheumatology, Medical University of Lublin. Results: More than half of the cohort was diagnosed during the period from 2017 to 2021. The average age at the time of diagnosis was 12,5 years. Most of the children (75%) were girls. 5 of 21 had a positive medical history of a tick bite. Erythema migrans was observed in 3 of them. The most frequently joints were knees (67%) and right wrist (29%). Patients complained predominantly about pain (81%), motor deficit (57%) and morning stiffness (9,5%). Physical examination revealed prevalingly swelling (71%) and warmth (52%) of affected joints. In 13 of 21 patients ultrasonography was performed. The most frequent findings was: increased amount of synovial fluid (48%), synovial hypertrophy (48%). 16 of 21 children received at least one antibiotic. 7 of them required more than one course of antibiotic therapy. Conclusions: Although erythema migrans seems to be the most distinguishing manifestation of Lyme disease, it does not always appear among children. It is significant to remember that joint inflammation may be the first clinical feature of borreliosis. Therefore, pediatricians should consider Lyme arthritis as possible diagnosis in patients with arthritis, especially in endemic areas.

## Trends in Paediatric Intensive Care Unit Admissions in 2020 Compared with Two Decades Before COVID-19 Pandemic

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**Tutors:** MD Reinis Balmaks, MD Ivars Veģeris

**Aim of the study:** To determine the seasonal patterns of a variety of common pediatric intensive care unit (PICU) admission diagnoses and compare data from the previous decades with 2020 admissions.

**Methods and materials:** This retrospective observational study involved all PICU admission episodes for patients, aged 28 days to 18 years, at Children's Clinical University Hospital in Riga, Latvia from January 1, 1998 to December 31, 2020. The primary outcome of this study was the median number of PICU admissions per month. Clinical data were collected from electronic medical records and historical PICU logbooks. All statistical analyses were performed by using R Studio software.

**Results:** A total of 12,824 patient encounters were analysed. The median number of PICU admissions per month during the study periods was 46 (IQR 40–53); in 2020 it was the lowest of the period, median, 32.5 (IQR 31.75–39), compared to 47 (IQR 41–53) for 1998–2019. In 2020, PICU admissions in April were the lowest in the study period 29, compared to median of 47.5 (IQR 41.5–54.25). Overall, the lowest number of admissions over the study period was observed in December, median 39 (IQR 33.5–43), while the highest was in May, median 51 (IQR 47.5–57).

**Conclusions:** In 2020 we observed a decrease in number of PICU admission for non-COVID-19 related diagnosis, particularly after state-wide lockdown measures. Whether this indicates a positive (reduced incidence of communicable disease) or a negative (unmet medical needs, e.g. cancelled elective surgeries) remains to be elucidated.

## Factors associated with the relapse of Pediatric Hodgkin Lymphoma: a 10-years retrospective analysis.

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**Presenting author:** Anna Mikołajczyk

**Tutors:** MD Julia Kołodrubiec, MD Justyna Kowalkiewicz

**Introduction:** Pediatric Hodgkin Lymphoma (HL) is a typical cancer that affects the lymphatic system. The two main types of pediatric Hodgkin lymphoma are classic and nodular lymphocyte-predominant. Classic Hodgkin lymphoma is the most common type of Hodgkin lymphoma. It occurs most often in adolescents. HL is one of the most curable neoplasms with a 5-year survival rate approaching 95%.

**Aim of the study:** Identification of factors assessed during the initial diagnosis of Hodgkin Lymphoma (both clinical or laboratory) that may have an impact on HL progression or relapse of disease.

**Material and methods:** A retrospective analysis of medical records of pediatric patients diagnosed with HL, hospitalized at the Department of Pediatrics, Oncology, Hematology and Diabetology, the Medical University of Lodz between 2010 and 2020 was conducted. We took into account the following factors: sex, age, disease stadium, presence of B symptoms, treatment methods, adverse effects of treatment, organs involvement. Moreover, the laboratory results were analyzed. The patients were afterwards split into relapse and non-relapse groups respectively. Data were processed with Microsoft Excel and IBM SPSS.

**Results:** Our research group consisted of 37 patients (female - 18, male - 19). The mean age of the group was  $12,7 \pm 4,15$  years. According to Ann Arbor staging classification: 4 (10,8%) patients were diagnosed with I stage disease, 15 (40,5%) – II stage, 7 (18,9%) – III stage and 11 (29,7%) with stage IV. Relapse occurred in 9 (24,3%) patients. The following initial factors were associated with the refractory disease: initial bone marrow involvement (33,3% of patients in relapse group vs. 0% of patients in non-relapse group;  $p=0.02$ ), spleen involvement (66,7% of patients in relapse group vs 17,6% of patients in non-relapse group;  $p=0.05$ ), positive family history (33,3% vs 3,6%;  $p = 0,012$ ) and higher mean LDH level (333.6 IU/l vs 216.6 IU/l;  $p=0.01$ ). Moreover, there was a correlation between the occurrence of the adverse effects on the part of the nervous system after the first cycles of chemotherapy and the recurrence (41,2% vs 10%;  $p=0,028$ ). Interestingly factors such as the stage of the disease, presence of B symptoms, additional treatment with radiotherapy and treatment protocol were not statistically significantly different between the groups ( $p$  values: 0,424; 0,106; 0,079; 0,97 respectively).

**Conclusion:** The obtained results indicate that increased initial LDH level, disease prevalence of HL in the family, bone marrow and spleen involvement, the occurrence of negative side effects on the part of the nervous system after the first cycles of chemotherapy are associated with progression or relapse of HL. However, it should be noted that due to the sparsity of patients in both groups as well as a lack of equality between the groups firm conclusions cannot be drawn. A study on a bigger population of patients is warranted.

## **Toxicity of native *Escherichia coli* L-asparaginase versus PEG-asparaginase in treatment of pediatric patients diagnosed with acute lymphoblastic leukemia**

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**Presenting author:** Justyna Józwiak

**Tutor:** MD Justyna Walenciak

**Introduction:** Acute lymphoblastic leukemia (ALL) is the most common type of cancer in children. Treatment of ALL consists of many drugs, one of which is L-asparaginase (L-Asp). L-Asp can be obtained in three preparations - two of which, derived from *E.coli* are: native L-Asp and pegylated PEG-Asp.

**Aim of study:** The goal of this study is to compare drug toxicities between native *E. Coli*-L-Asp and PEG-Asp in pediatric patients diagnosed with ALL, such as: drug hypersensitivity, silent inactivation, thrombosis, hemorrhagic incidents, hypertriglyceridemia, hepatotoxicity, encephalopathy and acute pancreatitis.

**Materials and methods:** This is a retrospective case-control study conducted in the Department of Pediatrics, Oncology and Hematology of the Maria Konopnicka's Hospital in Łódź in the years 2016-2020 of children diagnosed with ALL treated with native *E.coli* L-Asp or PEG-Asp. The toxic effects were defined according to Ponte di Legno working group and Polish Society for Pediatric Oncology and Hematology official recommendations. Statistical analysis of results was performed using Statistica 13.1. and  $p < 0.05$  was considered statistically significant.

**Results:** Altogether, 70 patients were included in the study, 35 PEG-Asp treated patients and matched by age and sex group of 35 native *E.coli* L-Asp patients. Patients were diagnosed at median age of 5 (25%-75%: 1-16), with 59 ALL-B and 11 ALL-T, with 6 patients in high-risk group. There was a significant difference in drug hypersensitivity ( $p=0.0018$ , native *E.coli* L-Asp - 17, PEG-Asp - 4) - the allergic reactions were significantly more common and severe in the group treated with native L-Asp (OR = 7.32, 95%CI 2.13-25.15). Although the difference in thrombosis was not statistically significant ( $p=0.2597$ ), PEG-Asp shows tendency towards thrombosis (native *E.coli* L-Asp - 2, PEG-Asp - 6), however this might have been affected by presence of high-risk group patients. Other toxicities did not reach statistical significance: hemorrhagic incidents (native *E.coli* L-Asp - 3, PEG-Asp - 3), hypertriglyceridemia (native *E.coli* L-Asp - 5, PEG-Asp - 3), hepatotoxicity (native *E.coli* L-Asp - 29, PEG-Asp - 31), encephalopathy (native *E.coli* L-Asp - 7, PEG-Asp - 5) acute pancreatitis (native *E.coli* L-Asp - 2, PEG-Asp - 4).

**Conclusions:** In analyzed group of 70 patients, PEG-asparaginase presented better immunogenic profile than native *E.coli* native L-Asp. Other toxicities reported were similar for the two tested drugs.

## Features Of The Course Of Rhythm And Conduction Disorders Children's Hearts

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**Aim of the study** to study heart rhythm disorders in children who were on inpatient treatment in the cardiorheumatology department of the Children's Clinical City Hospital No. 4 in the city of Tashkent.

**Material and method:** The analysis of 40 inpatient patients of the children 's cardiorheumatology department for the period of 2019 was carried out. Of these, 23 boys (57.5%), 17 girls (42.5%). The age structure of the examined children was from 1 year to 18 years, among them, children aged 1-3 years — 6 (15 %); 4-7 years — 11 (27.5 %); over 7 years-23 (57.5 %). The general clinical examination of the child included a clinical examination, electrocardiographic examination, and daily monitoring of the Holter ECG.

**Results:** Out of 40 patients, 21 (52.5%) had cardiac arrhythmias. Moreover, 8 children (38.1%) received complaints of rhythm disorders, the rest of the heart rhythm disorders were detected during the examination. The most common rhythm disorders occur in the age group over 7 years. It was found that significantly more frequent cardiac arrhythmias occur in males 13 (61.9%). In the anamnesis of children with rhythm disorders, family burden due to cardiovascular pathology, repeated acute infectious diseases and foci of chronic infection are often detected. Rhythm disturbances in children are often asymptomatic, which does not allow us to accurately determine the time of their appearance. In 13 (61.9%) cases, arrhythmias were detected accidentally (on an ECG). The structure of cardiac arrhythmias was as follows: sinus node dysfunction 1 (4.8%); WPW phenomenon 1 (4.8%); sinus tachycardia 5 (23.8%); sinus bradycardia 11 (52.4%); paroxysmal ventricular tachycardia 1 (4.8%); ventricular extrasystole 2 (9.5%). Regardless of the form of cardiac arrhythmias, the main complaints are: cardialgia 15 (71.4%); fatigue 12 (57.1%); headaches 7 (33.3%); palpitations 6 (28.6%); lack of air 4 (19%); fainting 1 (4,8%). In the vast majority of cardiac arrhythmias occur against the background of cardiovascular diseases: secondary cardiomyopathy 2 (9.5%); congenital heart defects 3 (14.3%); somatoform vegetative-vascular dystonia 11 (52.4%) and others diseases account for 5 (23.8%).

**Conclusions:** Heart rhythm and conduction disorders are found in children of all ages. In order to detect arrhythmias in a timely manner, it is advisable to conduct regular ECG monitoring, especially during periods of the greatest risk of their development (older than 7 years old).

## Comparison of sociodemographic data and functional impairment in patients with Juvenile idiopathic arthritis and acute versus chronic sacroiliitis

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**Introduction:** Juvenile idiopathic arthritis (JIA) is a pediatric autoimmune disease that can cause sacroiliitis decreasing quality of life. The incidence of sacroiliitis is rather low and there have been no studies about sociodemographic data and functional impairment in patients with acute or chronic sacroiliitis.

**Aim of the study:** To evaluate and compare sociodemographic data and functional impairment measured by children's health questionnaires (CHAQ) and visual analogue scale (VAS) in patients with JIA and acute versus chronic sacroiliitis.

**Methods:** Medical history of 82 patients over the period of 2014 to 2018 were analyzed in this retrospective study, using Children's Clinical University Hospital database. MS Excel and IBM SPSS Statistics 26.0 were used for data compilation and analysis.

**Results:** Sacroiliitis was radiologically confirmed in 63% (n=52) patients, while 29% (n=24) had no radiological signs of sacroiliitis, and 7% (n=6) had no radiological examination. Two most common types of JIA in 47% and 31% of patients with sacroiliitis were RF-negative polyarthritis (M08.3) and enthesitis-related arthritis (M08.1) with no significant difference between acute and chronic sacroiliitis ( $p=0.869$ ). 73% (n=38) of patients with confirmed sacroiliitis were girls with no significant difference between acute and chronic inflammation (69% vs 73%, respectively;  $p=0.776$ ), only 27% (n=14) were boys. Mean age was 14 years with significant difference between acute and chronic sacroiliitis (13 vs 15 years, respectively;  $p=0.035$ ). Family anamnesis was negative in majority of patients - 55% (n=26), positive in only 40% (n=21) and unknown in 10% (n=5) with no significant differences between acute and chronic sacroiliitis ( $p=0.406$ ). Mean time from the onset of symptoms was 22.2 months, time from confirmation of JIA - 13.2 months, and time from onset of symptoms to diagnosis - 11.5 months with no significant difference between patients with acute and chronic sacroiliitis ( $p>0.5$ ). Mean CHAQ score was 0.521 in patients with acute and 0.280 - with chronic sacroiliitis, however this difference was not statistically significant ( $p=0.110$ ). Mean VAS score was 4.56, but VAS evaluated by doctor - 3.54 with no significant differences between groups.

**Conclusions:** Most commonly acute or chronic sacroiliitis was found in girls with RF-negative polyarthritis or enthesitis-related arthritis and negative family anamnesis. Acute sacroiliitis was more frequently found in younger patients compared to chronic sacroiliitis. Time from the onset of symptoms and JIA diagnosis confirmation in case of chronic sacroiliitis was not significantly longer than in case of acute sacroiliitis. Although mean CHAQ score was higher in patients with acute sacroiliitis, the differences between acute and chronic sacroiliitis in CHAQ and VAS scores were not significant.

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## Effect of LED on in vitro shoot culture *Dracocephalum forrestii* W.W. Smith

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**Introduction:** *Dracocephalum forrestii* W.W. Smith (Lamiaceae) is a Tibetan medical plant, native to the mountain regions of Yunnan province (China). In traditional Chinese medicine, aerial parts of the genus are used as diuretic, astringent and antipyretic agents. These properties are conditioned by the secondary metabolites such as: flavonoids, lignans, terpenoids and phenolic acids.

**Aim of the study:** The objective of this work was to investigate the effect of wavelengths of light emitted from LEDs on cultured in vitro shoots of *D. forrestii*.

**Material and methods:** The shoots were grown on Murashige and Skoog agar medium with 0.5 mg/l benzylaminopurine (BAP) and 0.2 mg/l indole-3-acetic acid (IAA) under four light environments: blue, red, red/blue (7:3) and white (control).

**Results:** After five weeks of culture, shoot multiplication rate, biomass and morphology were evaluated, as well as photosynthetic pigments content. It was found that the red and combination red and blue light had the strongest effect on morphogenesis and shoot propagation; in these conditions, more than 4,90 (for red/blue light) and 3,35 (for red light) new shoots were obtained per explant. The red/blue light cultures demonstrated the highest fresh (0,29 g/tube FW) and dry weights (0,031 g/tube DW). The contents of total chlorophyll were highest for shoots grown under blue light: 0,664 mg/g FW. While the highest content of carotenoids (0,101 mg/g FW) were observed in the shoots growing in red/blue light.

**Conclusions:** Summarizing, it was observed that the type of light affects the morphology as well as the content of assimilation pigments. Moreover, it is planned to test the obtained shoots for the content of metabolites.



## **Optimization of secondary metabolites production in *Salvia viridis* L. shoots cultivated on a large scale in the Plantform bioreactor**

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**Introduction:** *Salvia viridis* (Lamiaceae family) is a plant native to Turkey and Iran. It has been used for centuries to treat inflammation and infectious diseases. This plant has been described as an antimicrobial, antifungal, antioxidant, anti-inflammatory and antidiabetic agent. It can be also potentially used in the prophylaxis and treatment of Alzheimer's and Parkinson's diseases. The multidirectional biological activity of *S. viridis* is related to the presence of polyphenolic acids, phenylethanoids, flavonoids and diterpenes.

**Aim of the study:** The aim of study was optimization of growth conditions for efficient secondary metabolites production in *Salvia viridis* L. shoots cultivated in the Plantform bioreactor. This would enable the supply of a significant quantity of raw material rich in valuable compounds in a short time.

**Materials and methods:** The material for the study were shoot tips of *S. viridis* L., which were cultivated on MS medium (Murashige and Skoog) supplemented with 0.1 mg/l IAA (indolylacetic acid) and 1 mg/l m-Top (meta-topolin), in a temporary immersion system Plantform. Bioreactors were kept at  $26 \pm 2^\circ\text{C}$ , 80-90% humidity, under a 16 h photoperiod provided by fluorescent lamps. The content of the bioactive compounds produced was determined by HPLC method.

Initially, the culture was immersed with medium every 80 min for a 10 min. Shoot growth parameters and bioactive compound production were determined after 2 and 3 weeks. Then, the semi-continuous culture technique was applied and after 2 weeks the used medium was partially replenished. In this case, the shoots were grown for another week or two. In the last stage of the research the number of daily immersion periods was reduced by half.

**Results:** The most efficient growth was achieved for shoots grown for 4 weeks in a semi-continuous system immersed every 80 min, followed by shoots from 3 weeks of continuous culture, which made it possible to obtain a large amount of plant material in short time. The highest amount of bioactive compounds in hydromethanolic extracts was reported in the case of 3 weeks of continuous culture, with the frequency of immersion every 80 min; 29 mg/g DW. In all tested samples rosmarinic acid was the predominant polyphenolic acid, while verbascoside was the predominant phenylethanoid. The maximum obtained rosmarinic acid level, 16.6 mg/g DW, was 13 times higher than in the shoots of six-month-old plants growing in the soil.

**Conclusions:** Our finding demonstrated that effective large-scale cultivation of *S. viridis* shoots in the Plantform bioreactor is possible. However, in order to obtain optimal results, it is necessary to match the appropriate cultivation parameters such as its duration, the immersion frequency or the application of the semi-continuous culture technique. The obtained in the study plant material is a rich source of valuable compounds, among which rosmarinic acid and verbascoside are the predominant ones.

**Determination And Evaluation Of Crude Extracts Of Batuan (Garcinia Binucao Linn. Family: Clusiaceae) Fruits As Anti-hyperlipidemic On High Cholesterol Diet - Induced Sprague Dawley Rats**

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**Abstract:**Hyperlipidemia is a major risk factor for heart disease, and this is the leading cause of death. Many people are suffering from hyperlipidemia and this ailment is one of the most common diseases in the Philippines. Herbal medicine is widely used throughout the world, especially in the Philippines, because it is cheap and readily available. Because of this, the researchers studied the anti-hyperlipidemic effect of Batuan (*Garcinia binucao* Linn.) to find a new source that can help treating hyperlipidemia. This study aims to determine and evaluate the antihyperlipidemic effect of Batuan fruits in Sprague Dawley rats. Extraction of Batuan was conducted by Maceration method using 95% Ethanol as solvent. A sample of 5 rats per group was employed in the study. Distilled water served as negative group, atorvastatin served as positive group and 50 mg/kg ad 100 mg/kg of Batuan extract served as treatment group. The test results for the significant difference of between post- inducement and post-treatment within group showed that Distilled water is not significant for HDL, LDL, TG, VLDL, and TC. For Atorvastatin, it significantly decreases the count of LDL, TG, VLDL, and TC, and significantly increase the HDL count. For 50 mg/kg Batuan extract, it significantly decreases the LDL, TG, and, TC and significantly increase the HDL count. For 100 mg/kg Batuan extract, it significantly decreases the LDL, TG, and TC and significantly increase the HDL count during post treatment.

**Potential Hypoglycemic Effect of Binayuyo (*Antidesma ghaesembilla*, Family: Phyllanthaceae) Leaves Crude Extract – Alloxan Induced Hyperglycemic Institute of Cancer Research (ICR) Mice**

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**Abstract:** Plants have been one of the most used natural resources for medical purposes especially in Asia. The world's population (75-80%) relies on plants for their primary health care according to the World Health Organization (WHO). Perceiving the enormous potential, they offer, therapeutic plants have been continually utilized in defining new medications. This study aimed to determine the potential hypoglycemic effect of Binayuyo leaves crude extract (*Antidesma ghaesembilla*, Family: Phyllanthaceae) using Alloxan induced hyperglycemic Institute of Cancer Research (ICR) mice. Binayuyo tree grows with a thick crown that could be measured up to 20 meters tall. Its fruit has a touch of purple. Other parts of the tree were accounted to be used for food and medication. The researchers used the ethanolic crude extract of Binayuyo leaves to be tested for the potential hyperglycemic effect. The crude extract was put to rotary evaporator to discard excess alcohol. After the process, the product was used to mice. The study employed a total of 36 ICR mice wherein 6 mice were allocated per group. There were five groups in the study; Distilled water as the negative control, insulin as the positive control, 500 mg Binayuyo extract, 750 mg Binayuyo extract, and 1000 mg Binayuyo extract. Observations were done in a four-hour period. Results showed that distilled water does not significantly lower the glucose level in 4 hours of observation. Binayuyo shows a potential hypoglycemic effect on the fourth hour of observation compared with the glucose level of post-alloxan. Binayuyo at 750 mg and 1000 mg of concentration has no significant difference with insulin in lowering glucose level.

## Short chain fatty acids and long chain fatty acids exhibit opposite effect on colorectal cancer cells viability

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**Tutor:** MSc Agata Binienda, Prof. Jakub Fichna

**Introduction:** Colorectal cancer (CRC) is the third most common cancer worldwide with estimated number of nearly 2 million new cases diagnosed last year. Even though in many highly-developed countries a 5-year survival rate has reached over 60%, CRC still remains the second most frequent cause of cancer-related death. Besides standard treatment of CRC, consisting of surgical intervention and chemotherapy, dietary interventions are postulated as a supplementary therapy. Recent literature data suggest involvement of free fatty acids (FFAs) and FFA receptors (FFARs) in the pathophysiology of CRC. There are 4 major types of FFARs: FFAR1 and FFAR4, activated by long chain fatty acids (LCFAs), along with FFAR2 and FFAR3, stimulated by short chain fatty acids (SCFAs). Both in vivo and ex vivo studies evidenced increased expression of FFAR4 in CRC cell lines and tissues. Additionally, FFAR4 synthetic ligands were found to contribute to cancer development by affecting metastasis and migration of CRC cells. On the other hand, expression of FFAR2 is significantly reduced in colon tissue of patients with CRC compared to healthy controls.

**Aim & Methods:** The purpose of the study was to evaluate the effect of SCFAs (acetate and butyrate) and LCFAs (stearate and palmitate) on viability of human adenocarcinoma (HT-29 and SW-480) and colonic epithelial (CCD-841 CoN) cell lines using MTT test.

**Results:** Acetate (50 and 100 mM) significantly decreased viability of HT-29 and SW-480 cell lines compared to control ( $p < 0.005$ ). At both concentrations the cytotoxic effect of acetate was more potent in the SW-480 cell line. In case of butyrate, a significant decrease in CRC cells viability was observed at the concentration of 2.5 and 5 mM ( $p < 0.005$ ). In contrast to acetate, butyrate exerted a more potent cytotoxic effect on the HT-29 cell line. Combination of LCFAs (mixture of stearate and palmitate at the ratio 1:1; 50 - 200  $\mu$ M) reduced viability of both CRC cell lines: HT-29 and SW-480, but also CDD-841 CoN cells.

**Conclusion:** This study confirmed the anti-tumor activity of natural FFAR2 agonists. Acetate (50 mM) and butyrate (2.5 mM) decreased viability of CRC cell lines but did not significantly affect the viability of normal colonic epithelial cells. Surprisingly, LCFAs (stearate and palmitate) also reduced viability of cancer cells, however a stronger effect was seen on non-cancer cells. These results demonstrated the influence of FFARs on cancer cells growth and form a strong basis for further in vivo and - in the long-term - clinical investigations.

## Evaluation of radiolabeled tetrahydroacridine derivatives for preclinical neurodegenerative imaging.

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**Tutor:** MD PhD Kamila Czarnecka

**Introduction:** Alzheimer's Disease (AD) is the most common and complex neurodegenerative disorder and the main reason of dementia among people over the age of 65. The most important factors of presence of AD are low level of acetylcholine, aggregation of  $\beta$ -amyloid, disorders of metal homeostasis and oxidative stress. Unfortunately, despite the fact that Alzheimer's disease has been known for more than 100 years, still there is no effective diagnostic method of this disease. Scintigraphy is one of the most promising method. Properly selected isotopic tracers enable detection of pathological changes in the early stage of disease.

**Aim of the study:** The aim of the study was to check in vitro properties of new compounds which can be potentially used for the diagnosis of Alzheimer's disease. To assess the properties research on inhibition of acetylcholinesterase and butyrylcholinesterase was conducted

**Material and methods:** Modified Ellman's method was used to assess the capacity of the novel cyclopentaquinoline hybrids to inhibit AChE (from the electric eel) and BuChE (from equine serum. AChE, BuChE, acetylthiocholine iodide (ATCI), DTNB (Ellman's reagent) were supplied by Sigma Aldrich. 96-well plates were used. To each well 14  $\mu$ l of tested compound in different concentration, 40  $\mu$ l of acetylthiocholine iodide, 76  $\mu$ l of DTNB 10  $\mu$ l of acetylcholinesterase or butyrylcholinesterase were disposed. The absorbance was measured at a wavelength of 412 nm after 10 minutes (AChE) or eight minutes (BuChE) incubation at room temperature. Each experiment was carried out in triplicates. IC50 (the concentration of the test compounds causing 50% inhibition) was calculated to assess inhibitory activity.

**Results:** As a result of executed analyses radiopharmaceutics with the most remarkable potential were selected and passed to preclinical studies in rats. Obtained results allows to conclude that new substances can become new markers for CNS.

**Conclusions:** Obtained results allowed to assess affinity of potential radiopharmaceutics in selected CNS structures. On that basis structure of imaging examinations were selected .

## **The evaluation of curcumin-nanosilver(I) and nanocurcumin-nanosilver(I) complexes as a new therapeutic option to treat inflammatory bowel diseases.**

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**Tutors:** Julia Krajewska, Prof. Jakub Fichna, BEng Marcin Banach

**Introduction:** Inflammatory bowel disease (IBD) is a condition characterized by chronic inflammation of the gastrointestinal tract with detrimental impact on quality of patients' life by causing persistent symptoms and forcing frequent hospitalizations. Current treatment strategies are insufficient, expensive and connected with high toxicity. Curcumin is a natural compound with anti-inflammatory and antioxidant properties. Research conducted on animals revealed promising results on curcumin as alternative in IBD treatment. The combination of curcumin with silver(I) ions using nanotechnology may synergistically enhance its activity, provide targeted drug delivery and improved bioavailability.

**Aim of the study:** The aim of this project was to assess the effectiveness of curcumin-nanosilver(I) and nanocurcumin-nanosilver(I) complexes (nAg+curcumin, nAg+ncurcumin) in treatment of IBD and to investigate if nAg improves curcumin's anti-inflammatory effectiveness.

**Material and methods:** The experiment was conducted in two phases. In vitro studies were performed with the use of RAW264.7 cell line and the following formulations were investigated: curcumin, nAg stabilized by gallic acid, nAg+curcumin, and nAg+ncurcumin. The cytotoxicity of the compounds was evaluated by Neutral Red Uptake (NRU) test. Subsequently, the production of nitric oxide, used as a marker of inflammation, was determined using Griess reagent.

In in vivo phase 34 Balb/C mice were divided into four groups- 1) control group and three other groups that underwent dextran sulfate sodium (DSS) induced murine model of IBD: 2) DSS treated; 3) DSS+ nAg + ncurcumin; 4) DSS+nAg + curcumin. DSS-treated groups received 3% DSS drinking solution from day 0 to day 4 with subsequent change to water from day 5. The examined complexes were administered orally from day 3 to day 6. Mice were sacrificed by cervical dislocation on day 7 and colonic damage was evaluated macroscopically. Total macroscopic score was calculated taking into consideration the following parameters: colon length and weight, ulcer score, fecal blood and diarrhea.

**Results:** In vitro studies show that combination of curcumin with nAg improved anti-inflammatory properties comparing to curcumin alone. Moreover, preparation of curcumin with nanotechnology further enhanced this activity. In in vivo studies DSS treatment resulted in higher macroscopic inflammation score than control. Treatment with both nAg+curcumin and nAg+ncurcumin lowered inflammation score.

**Conclusions:** The combination of curcumin with nAg had positive impact on curcumin's anti-inflammatory activity. Moreover, nanotechnology techniques turned out to further increase treatment efficiency. These results suggest curcumin as a promising therapeutic option and nanotechnology as valuable technique in potentialization of treatment strategies in future IBD therapy.

## **Diallyl sulfide, a selective inhibitor of CYP2E1, maintains epithelial barrier integrity and protects against inflammation in vitro.**

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**Introduction:** Diallyl sulfide (DAS) is one of the main organosulfur phytochemicals isolated from garlic, which is widely used in traditional medicine. The compound displays many beneficial properties, including antioxidant, anticancer, and anti-inflammatory activities. DAS is also a selective inhibitor of CYP2E1, which is one of the most active isoforms of cytochrome P450. CYP2E1 is expressed in human colorectal adenocarcinoma Caco-2 cells, whereas it is not detectable in RAW264.7 macrophages. Current literature suggests that overactivity of intestinal CYP2E1 leads to the loss of intestinal wall integrity and may be responsible for intestinal barrier impairment caused by fructose.

**Aim of the study:** The aim of the study was to test the hypothesis, that DAS improves epithelial barrier integrity and reduces inflammation. The additional purpose was the analysis of CYP2E1 expression in the colon of control and Inflammatory Bowel Disease (IBD) patients.

**Materials and methods:** To obtain confluent monolayer and monitor its permeability, Caco-2 cells were grown on transwell inserts. Then cells were exposed to 2.5 mM fructose alone or after pretreatment with 100µM DAS for 1h. The measurement of permeability was performed using the transepithelial electrical resistance (TEER) technique. To evaluate the influence of DAS on the inflammatory response in Caco-2 cells, the cocktail of IFN $\gamma$ , TNF $\alpha$ , IL-1 $\beta$ , and LPS was used to stimulate interleukin 6 (IL-6) secretion in the absence or presence of DAS at various concentrations (100, 300, 500µM). To control the toxicity of DAS, cell viability was analyzed by the MTT test.

In addition, we evaluated the anti-inflammatory activity of DAS (100, 300, 500, 1000µM) by measurement of NO production by LPS-stimulated RAW264.7 macrophages. The analysis of relative CYP2E1 mRNA expression in human surgical colon specimens was done using qPCR.

**Results:** The permeability of Caco-2 monolayer increased after exposure to fructose. Caco-2 pretreated with DAS were resistant to those changes. Moreover, DAS decreased the level of IL-6 in the culture medium after stimulation of Caco-2 cells with inflammatory cytokines. The results were statistically significant only for DAS at the concentration of 100µM. Furthermore, we observed that treatment with DAS resulted in significant and dose-dependent inhibition of the inflammatory response in LPS-stimulated RAW264.7.

We did not observe any differences in the expression of CYP2E1 between control and IBD samples.

**Conclusions:** Our observations on the Caco-2 monolayer suggest that CYP2E1 may contribute to fructose-induced increase in the permeability of intestinal wall. The selective inhibitor of CYP2E1, DAS, strengthened the cellular barrier integrity and alleviated inflammation in the in vitro models. On the other hand, the beneficial properties of DAS are in part independent from CYP2E1 inhibition, since reduced inflammation was present in RAW264.7 cells, in which CYP2E1 is not expressed.

## Determination of antibacterial activity of *Calluna vulgaris* stem extracts

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**Introduction:** The increasing number of drug resistant and multi-drug resistant bacterial strains is one of the key issues of present day infectious disease medicine. The research for new antimicrobial substances to counteract this problem is a priority for health organisations globally and in individual countries. A lot of new studies are devoted to exploring new antibacterial substances from medical plants that could serve as alternative against bacterial diseases.

*Calluna vulgaris* is dwarf bush with wide growth area. It is recognised as medical plant widely used in folk traditional medicine and phytotherapy, also with potential antibacterial properties.

**Aim of the study:** Aim of the study is to determine optimal concentration for *Calluna vulgaris* stem extract antibacterial activity with different solvents.

**Materials and methods:** Extracts of *Calluna vulgaris* were diluted with acetone and ethanol solutions in varying concentrations – 30%, 50% and 70%. Diluted extracts were tested for their antibacterial activities against *Staphylococcus aureus* (V256), *Escherichia coli* (V252), *Escherichia coli* (V4), *Staphylococcus aureus* (ATCC), *Escherichia coli* (ATCC), *Streptococcus agalactiae* (V171), *Serratia liquefaciens* (V251), *Streptococcus uberis* (V243).

The antibacterial activity of the plant extracts was evaluated using a disk diffusion assay. Inhibition zones for each bacteria were measured.

The obtained data were statistically processed employing the IBM SPSS and Microsoft Excel 2016 software using descriptive statistics and correlation analysis.

**Results:** Results showed that the highest antibacterial activity was for 30% ethanol and acetone solutions. The higher concentration was used to determine it, the smaller inhibition zone was observed.

Highest antibacterial activity amongst all bacteria showed *Staphylococcus aureus* (V256), exposed to extract diluted with 30% ethanol solution, where an inhibition zone with a large diameter ranged between 23 to 28 mm (arithmetic mean=25,3 mm;  $s=2,22$ ; CV 8,78%). Highest antibacterial activity looking at all bacterial cultures together showed *Calluna vulgaris* extract diluted with 30% ethanol solution where the arithmetic mean for inhibition zone was 14 mm ( $s=5,34$ ; CV 38,16%).

Strong negative correlations were noted between both solution concentrations and antibacterial activity. For acetone  $r=-0,469$ ,  $p=0,021$ ,  $n=24$  and for ethanol solution  $r=-0,507$ ,  $p=0,012$ ,  $n=24$ .

**Conclusion:** From the concentrations used in the experiment as most optimal was observed 30%. The higher the concentration of solutions were used, the less antibacterial activity was observed.

*Calluna vulgaris* stem extract diluted in both solutions showed promising potential of antibacterial activities against all tested bacterial cultures. *Calluna vulgaris* antibacterial properties could be used in infectious disease treatment in future.



## **Knowledge, Attitude and Practice of Antibiotic Use: A Cross-Sectional Survey amongst the population of the Gaza Strip**

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**Introduction:** Antibiotics are effective treatment for bacterial infections, but excessive use leads to bacterial resistance, which is a growing problem worldwide presenting a significant threat to public health globally. Public awareness, attitudes and practice towards antibiotics play a vital role to achieve effective treatment. In the Gaza Strip, antibiotics are easily obtainable over the counter, which increases the probability of antibiotic overuse.

**Aim of the study:** This study aims to assess the attitudes, awareness and practice in antibiotic use among the general population.

**Materials and methods:** This cross-sectional survey was performed using pretested self-administered questionnaires, which were distributed and collected among members of the public in public places around the Gaza Strip such as hospitals, gardens and universities during August and September 2018. Inclusion criteria for participants were to be adults (18 years and older) and not from the medical field. The questionnaires had four domains, sociodemographic data, assessment of basic knowledge about antibiotics, awareness of antibiotic use and practice of antibiotic use. To test for significant differences in the participants' awareness, independent t-test and ANOVA were done

**Results:** A total of 1650 were approached, the response rate was 90.9% and six cases were excluded due to incomplete sheets, yielding 1494 participants. From these, 54.6% (n=815) were males and the mean age was 38.8+13.1 years. The sample contained a variety of educational levels as 38.4% (n=574) had completed baccalaureus and 16.7% (n=250) had completed less than 10 years of education. Assessment of knowledge about basic information of antibiotics revealed poor knowledge (six or less points of the total 18) in 19.7% (n=295) of participants. On the other hand, 12.3% (n=184) demonstrated good knowledge (twelve or more points of 18). Accordingly, 38.6% (n=576) of participants showed poor attitudes (three or less points of the total of 10), while 13.5% (n=201) demonstrated good attitudes in using antibiotics (seven or more points 10). Interestingly, 43.3% (n=648) of participants reported poor antibiotic practices (six or less points of 18), while only 7% (n=102) showed good practices (twelve or more points of 18). The total antibiotic awareness score which combines basic knowledge, attitudes and practice of participants towards antibiotics showed that 22% had poor, 73% moderate, and only 5% good overall antibiotic awareness. Male gender and lower age group had significant statistical correlations with higher awareness levels toward antibiotics (p value ≤ ,05)

**Conclusions:** This study identified some crucial gaps in participants' basic knowledge and use of antibiotics, which could contribute to increasing antibiotic resistance.

## PHD

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## Sexual activity among women with the principal types of inflammatory bowel disease

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**Introduction:** Sexual functioning varies due to women's capabilities and restrictions and it is determined by emotional, psychological, hormonal and anatomical factors. When it comes to inflammatory bowel disease, we can relate to all of them. According to British data, the number of cases of inflammatory bowel diseases doubles every 10 years. Crohn's disease and ulcerative colitis are the principal types of inflammatory bowel disease and this study is based on these two diseases.

**Aim of the study:** The aim of this study was to establish sexual functioning among women with the most common types of inflammatory bowel disease.

**Materials and methods:** Our study sample was derived from and in cooperation with the Department of Gynaecology, Obstetrics and Oncological Gynaecology WNOZ in Katowice and Gastroenterology Ward at Clinical University Centre in Katowice. The survey consisted of 3 parts (47 questions in total). The first one included questions about socio-demographic characteristics. The second part was the Polish version of the standardized questionnaire- the Female Sexual Function Index (FSFI) questionnaire. It contains 19 questions. The result <26 points may indicate some dysfunctions in sexual functioning. The third and the last section contained questions related to the disease of the digestive system, including ones based on the Crohn's Disease Activity Index (CDAI) for Crohn's disease and the Clinical Activity Index (CAI) for ulcerative colitis to evaluate the disease severity. All data analyses were conducted using StatSoft Statistica 13.

**Results:** The study covered 230 women (the average age= 30 the standard deviation  $\pm 7,2$ ) with Crohn's disease and 179 women (the average age= 29,5 the standard deviation  $\pm 6,9$ ) with ulcerative colitis. The mean total score of FSFI women with Crohn's disease was  $25,5 \pm 6,5$ , in which 45,7% (n=105) had clinically significant sexual dysfunctions and 54,3% (n=125) had no major disorders. In women with ulcerative disease, the mean total score of FSFI was  $27,1 \pm 5,6$ , in which 33,5% (n=60) had clinically significant sexual dysfunctions and 66,5% (n=119) had no major disorders. The FSFI score of patients without inflammatory bowel disease was 30,1. The results showed a significant effect of remission on higher FSFI scores compared to patients with increased disease severity.

**Conclusion:** Based on the results, the odds of decreased women's sexual activity satisfaction is high in patients with the principal types of inflammatory bowel disease when symptoms flare up. This may be due to the reduction of their self-esteem, caused by the disease or the general sense of insecurity and discomfort during everyday life and any kind of activities. Patients should be thoroughly informed about all the possible options and methods that modern medicine offers. Moreover, as inflammatory bowel diseases are still considered to be a pretty shameful ailments, it occurs that it is a quite common problem, so the general society's awareness should be increased.

## **Analysis of preventable risk factors for *Toxoplasma gondii* infection in Polish pregnant women - preliminary results**

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**Presenting author:** Carlo Bieńkowski

**Tutors:** Prof. Maria Pokorska-Śpiewak

**Introduction:** *Toxoplasma gondii* (TG) is a parasitic protozoa. The two major routes of infection in humans include oral (by contaminated meat, dirty hands, soil, cat feces) and congenital transmission. The infection in adults is usually asymptomatic or mild. However, it may cause miscarriages or birth defects if the infection occurs during pregnancy. The incidence of congenital toxoplasmosis is estimated at 1-4/1,000 newborns. The presence of chorioretinitis, intracranial calcifications, and hydrocephalus is considered the classic triad of congenital toxoplasmosis.

**Aim of the study:** The aim of the study was to evaluate the risk factors for TG in pregnant women. The implementation of recommended screening tests towards other congenital infections was also analyzed.

**Material and methods:** Medical charts of all pregnant women with suspected TG infection admitted to the Department of Children's Infectious Diseases between 1st December 2019 till 14th March 2020 were retrospectively analyzed. The analysis included anamnesis data on risk factors of TG infection. Implementation of screening tests towards other vertical infections was also checked. The presumptive TG diagnosis was verified using serologic assessment of IgM, IgG titers and IgG affinity tests.

**Results:** The study group consisted of 88 pregnant women with suspected TG infection. Median age was 30 years (range: 16-41 years). The diagnosis of primary TG infection was confirmed in 31/88 (35.2%) women. In 34/88 (38.6%) the infection occurred in the past. In 18/88 (20.5%) women the diagnosis was excluded. The remaining women (5/88, 5.7%) had inconclusive results. In 55/88 (62.5%) women the recommended testing towards other infectious diseases dangerous for the fetus development was carried out correctly. History of miscarriage was more frequent in patients with TG compared to patients without any infection or with a history of infection in the past (9/31, 29% vs. 1/18, 5.6% vs. 2/34, 5.9%,  $p=0.01$ ). Moreover, women with toxoplasmosis were more likely to live in a rural area and more often had the recommended testing scheme carried out correctly compared to patients who had never had toxoplasmosis, respectively (18/31, 58.1% vs. 1/18, 5.6%,  $p=0.04$ ; 20/31, 64.5% vs. 10/18, 55.6%,  $p=0.03$ ). Women infected with TG more often had taken care of wild cats in the past compared to women that had never been infected (15/31, 48.4% vs 3/18, 16.7%,  $p=0.03$ ).

**Conclusions:** Risk factors that significantly affect the risk of TG infection in pregnancy are: living in rural area, history of miscarriage and taking care of wild cats in the past. Twenty percent of women with suspected toxoplasmosis had never had the infection. Whereas only in 62.5% of women the recommended testing scheme was carried out correctly. Educational role of a physician in these matters is crucial for efficient prevention of congenital toxoplasmosis.

## Assessment of vitamin K level in the women with intrahepatic cholestasis of pregnancy

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**Introduction.** Intrahepatic cholestasis of pregnancy (ICP) is a pregnancy-related condition, which is characterized by pruritus and an increase levels of bile acids (BA) and liver function tests. It is well known that vitamin (vit.) K acts as a co-enzyme which is necessary for the synthesis of proteins involved in hemostasis. In ICP, it can be mentioned a possible malabsorption of lipids leading to steatorrhea, which entails insufficient absorption of fat-soluble vitamins, particularly vit. K.

**Aim of the study.** To assess vit. K level in the women, who's pregnancy has complicated by ICP.

**Material and methods.** The prospective study was performed by assessing of 33 cases of ICP. There were assessed vit. K level (fractions assessed: vit. K1, vit. K2 MK4, vit. K2 MK7), coagulogram indices and blood loss during delivery.

**Results.** In the current study the level of bile acids varied widely, from 10 up to 127  $\mu\text{mol/l}$ . Therefore, mild ICP (BA values 10 – 40  $\mu\text{mol/l}$ ) was found in 25/33 (75.7%) cases, severe ICP (BA values <40  $\mu\text{mol/l}$ ) was found in 8/33 (24.3%) women.

In the present study there were assessed levels of vit. K fractions. Therefore, vit. K1 deficiency was found in 19/33 (57.5%) cases (reference values 0,13-1,19  $\mu\text{g/l}$ ). Vit. K2 MK4 deficiency was found in 2/33 (6.0%) female (reference values 0,10-0,82  $\mu\text{g/l}$ ), vit. K2 MK7 deficiency was found in 9/33 (27.2%) pregnant women (reference values 0,13-1,19  $\mu\text{g/l}$ ). Only in 9/33 (27.2%) cases there were found normal values of all the assessed vit. K fractions. At the same time, we were interested in complaints of the female included in the study, in aim to assess constitutional signs, such as lack of appetite and vomiting, which may cause nutrient malabsorption. According to our data lack of appetite had mentioned 6/33 (18.2%) women, vomiting – 4/33 (12.1%). However, there were no cases of steatorrhea in our study.

The majority of the female included in the study had normal coagulogram indices, there was 1/33 (3%) case of coagulogram abnormalities, with the next values: prothrombin by Quick 65%, fibrinogen 3.3 g/l, INR 1.35.

Twenty-two women in our study gave birth naturally. In 11/33 (33.3%) cases there was performed a c-section, from which 3/11 (27.2%) operations were performed in an emergency way.

Mean blood loss in women included in the present study was  $440 \pm 37.8$  ml, at the same time there was 1/33 (3.0%) case of massive post-partum hemorrhage (1000 ml), which was managed conservatively.

**Conclusions.** Traditionally, vit. K level is assessed indirectly by appreciating prothrombin time, prothrombin by Quick and INR levels. However, the aforementioned markers are more likely to indicate vit. K activity, then its real level. Besides that, prolonged prothrombin time is a late marker of vitamin K deficiency. It may underestimate the actual incidence of vitamin K deficiency. Therefore, further research is needed to appreciate vit. K levels, among women with ICP, in order to be able to assesses the real incidence of vit. K deficiency in this group of women."

## **Association between range of motion, dynamic balance, functional movement patterns, explosive strength of the lower limbs and dynamic knee valgus during single leg movement tasks in young football players**

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**Introduction:** Injury prevention is a key element of cooperation with young athletes. Dynamic knee valgus is considered as a risk factor for the occurrence of non-contact ACL injury in athletes. To better understand the cause and factors that predispose to knee valgus, it is important to know the relationship with other physical abilities.

**Aim of the study:** Therefore, the aim of our study was to assess the relationship between the range of joint mobility, dynamic balance, functional movement patterns, explosive strength of the lower limbs and dynamic valgus knee in young football players.

**Material and methods:** Twenty-eight young male athletes (age:  $13.8 \pm 0.8$  years, height:  $166.4 \pm 9.4$  cm, body mass:  $48.9 \pm 8.8$  kg) participated in the study. The data was collected using the Star Excursion Balance Test (SEBT), Functional Movement Screen (FMS), Single Leg Hop for Distance (SLHD) as well as a goniometer and a tailor's measure. Dynamic knee valgus was measured as a frontal plane projection angle in the Single-leg squat (SLS) and Single-Leg Landing (SLL) tests using 2D video analysis.

**Results:** Participants showed significant ( $p > 0.05$ ) higher values of the dynamic knee valgus for the left lower limbs ( $16.2^\circ \pm 7.7^\circ$ ) and right lower limbs ( $15.6^\circ \pm 9.1^\circ$ ) in the SLS test compared to the SLL test for the left ( $8.6^\circ \pm 6.2^\circ$ ) and right ( $9.4^\circ \pm 5.8^\circ$ ) lower limbs. Significant strong and moderate negative correlations were found between passive external hip rotation and knee valgus in the SLL ( $r = -0.47$ ,  $p = 0.012$ ) and between FMS and knee valgus in the SLL ( $r = -0.58$ ,  $p = 0.001$ ). A relationship was also observed between the SLHD and knee valgus in the SLS ( $r = -0.39$ ,  $p = 0.04$ ).

**Conclusions:** The range of motion of the hip external rotation, explosive strength of the lower limbs, and functional movement patterns are important factors for dynamic knee valgus and thus evaluating these variables will help prevent knee valgus.

## Poland Changes in the complete blood count-derived parameters in patients with Graves' orbitopathy according to smoking status

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**Introduction:** Graves' orbitopathy (GO) is the major extra thyroidal manifestation of Graves' disease (GD) with an autoimmune and inflammatory background. Smoking is considered as the main environmental factor responsible for the progression of subclinical eye disease into overt form. Several studies have proved that tobacco use affects both the innate and adaptive immune system, however the exact mechanisms by which it may contribute to GO development in GD patients remains unclear. Complete blood count (CBC)-derived parameters are suggested to be novel, non-invasive, and widely accessible markers of chronic subclinical inflammation.

**Aim of the study:** The aim of the study was to investigate the association between neutrophil-to-lymphocyte (NLR), monocyte-to-lymphocyte (MLR), and platelet-to-lymphocyte (PLR) ratios with smoking status in GD patients with and without GO.

**Material and methods:** Medical history of 406 GD patients with (n=168; female 82%) and without GO (n=238; female 81%), hospitalized in the Department of Endocrinology, Diabetology and Metabolic Diseases (Lublin) in the period from January 2008 to December 2019 were retrospectively analyzed. The control group consisted of 100 healthy volunteers. All patients were divided according to smoking status as never smokers (NS, n=306), current smokers (CS, n=148) and former smokers (FS, n=52). The exclusion criteria from both study and control groups were acute and chronic infections, autoimmune and inflammatory diseases, malignancy or hematological disorders, ocular surgery/trauma in the history, pregnancy, using drugs with the proven effects on morphology parameters in the past 6 months, radioiodine treatment and thyroidectomy. The CBC-derived ratios: NLR, MLR, PLR were assessed in all patients. The Statistica 13.0 software package was used for statistical analysis. P-value <0.05 was considered as statistically significant.

**Results:** The current tobacco use was observed more frequently in GO patients (37.5%) than in GD patients without GO (26.9%) or healthy individuals (21.0%). The average time of smoking and the number of cigarettes smoked per day were significantly higher in GD patients with GO as compared to those without thyroid eye disease (9.4±12.6 vs. 6.1±10.7 cigarettes/day, p=0.003 and 8.1±11.2 vs. 4.4±7.0 years, p<0.001). Smoking was associated with higher WBC (p=0.040) and neutrophil (p=0.049) values. Univariate analysis revealed that WBC (OR, 1.232; 95% CI, 1.101–1.380; p<0.001), neutrophil counts (OR, 1.421; 95% CI, 1.203–1.680; p<0.001), NLR (OR, 1.468; 95% CI, 1.093–1.970; p=0.011), and smoking (OR, 1.656; 95% CI, 1.084–2.531; p=0.020) showed a significant relationship with GO. Multivariate analysis demonstrated that WBC (OR, 1.209; p=0.001), NLR (OR, 1.348; p=0.048) may be risk factors for GO development.

**Conclusions:** The results of our study indicated that tobacco use is associated with increased activity of inflammatory process in the course of GD. Assessment of WBC and NLR may help identify GD individuals with high risk of GO development.

## Differences in physical activity levels by the degree of intellectual disability

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**Introduction:** Disability is a broad concept, used not only in the medical world, but permeates many spheres of life. One type of disability is intellectual disability defined as developmental conditions which are characterised for example by reduced cognitive functions. People with intellectual disabilities may be characterized by limited psychomotor development and they also have sensory-motor disturbances.

**Aim of the study:** The aim of the study is to assess physical fitness of people with intellectual disabilities.

**Methods:** The study was attended by 40 people, including 23 people with a disability to a light degree and 17 people with a moderate disability. The subjects were aged from 14 to 24 years. The test tool in the study was the Eurofit Special Fitness Test.

**Results:** Analyses of Student's t tests for independent samples showed that there were statistically significant differences between people with various degrees of disability in the gym bench passage  $t(37) = 7.54$ ;  $p < 0.001$ , long jump from place  $t(36) = 5.28$ ;  $p < 0.001$ , medical ball thrust  $t(36) = 3.30$ ;  $p < 0.01$ , run at 25m  $t(20) = -7.75$ ;  $p < 0.001$  and torso inclination from the lying down with legs bent  $t(36) = 7.93$ ;  $p < 0.001$ . There were no differences between persons with varying degrees of disability in terms of the forward-forward score in the flat sex  $t(37) = -1.66$ ;  $p = 0.105$ .

**Conclusions:** Eurofit Special Fitness Test is a very popular research tool for assessing physical fitness among people with intellectual disabilities. In this study people with moderate disabilities have shown less physical fitness than those with a mild disability. Intellectual disability is a condition that is becoming increasingly common in society. More attention should be paid to the physical fitness of people with intellectual disabilities by continuing research in this subject.



## Expansion of *Demodex folliculorum* in the group of patients taking anti-glaucoma preparations

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**Introduction:** The syndrome of symptoms accompanying the expansion of *Demodex folliculorum* has been identified as a disease called demodicosis. Literature data indicate a significant influence of the parasite on the development of human skin and eye diseases. Ocular demodicosis manifests mainly on the surface of the eye causing blepharitis, Meibomian gland dysfunction, dry eye syndrome, keratoconjunctivitis, and chalazions. Glaucoma is a group of diseases manifested by progressive atrophy of the optic nerve leading to defects in the visual field. The World Health Organization placed it on the list of civilization diseases. The available literature data confirm the occurrence of ocular demodicosis in patients suffering from glaucoma.

**Aim of the study:** The aim of the study has been to assess correlation between ocular demodicosis and developing glaucoma neuropathy. The analysis concerned the effect of anti-glaucoma treatment to the expansion of the *Demodex folliculorum*.

**Material and Methods:** The group of 50 patients treated at the Glaucoma Department of The Ophthalmology Clinic in Lublin completed the qualification questionnaire and voluntarily submitted diagnostic material in the form of 4 eyelashes from both eyes. The survey has been indicated into two parts. First of them was agreement to the diagnostic procedure. Second part contained informations about glaucoma treatment and subjective eye syndromes. The material was placed in saline and observed under a microscope. The preparation was assessed in terms of the presence, number and viability of the parasite.

**Results:** 27 men and 23 women participated in the study. Diagnostic examination revealed the presence of the parasite in 29 people, 16 men (55%) and 13 women (45%) which consists 58% of the whole studied group. 16 of 27 (59%) men and 13 of 23 (57%) women obtained positive results of the diagnostic test. Mean age of qualified group was 71,52. Participants with ocular demodicosis complained about subjective symptoms like burning eyelids (17/29), itchy eyelids (21/29), conjunctival redness (17/29), foreign body sensation in the eye (21/29) and blurred vision (23/29). Glaucoma treatment was used by 40 out of 50 patients. 7/50 weren't taking medicines and 3/50 didn't know the answer. In a group of 40 people receiving anti-glaucoma treatment 24 of them had ocular demodicosis which consist 60% of treated group. In a group of 7 people who didn't take medicines 5 patients had *Demodex folliculorum* which consists 71% of not treated group.

**Conclusions:** According to literature data, about 80% people over 60 years of age suffer from demodicosis. The obtained results indicate that anti-glaucoma treatment may have a limiting effect on the expansion of the parasite. Greater invasiveness was observed in men than in women. All patients diagnosed with the presence of the parasite had symptoms typical of ocular demodicosis.

## Features of carbohydrate metabolism indices in patients with non-alcoholic fatty disease and hypertension

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**Introduction.** Non-alcoholic fatty liver disease (NAFLD) affects about 25% of the adult population. Considerable attention is paid to the comorbid course of NAFLD with the hypertension (HT) due to common pathogenetic links and significant mutual negative impact of the pathologies. Indicators of carbohydrate metabolism in patients with NAFLD allow to assess the negative effects of the comorbid course of NAFLD and HT.

**Aim of the study.** To study the features of carbohydrate metabolism in patients with NAFLD and HT.

**Material and methods.** The study included patients with NAFLD (n = 115): group 1 consisted of patients with NAFLD and HT (n = 63), group 2 was created from patients with isolated NAFLD (n = 52). A group of 20 relatively healthy volunteers was formed to evaluate the control results. Biochemical parameters were obtained according to standard methods, the Homeostasis Model Assessment of Insulin Resistance was determined according to the generally accepted formula: HOMA-IR = fasting insulin ( $\mu\text{IU/ml}$ ) \* fasting glucose (mmol/l) / 22.5. Statistical analysis was performed using standard methods.

**Results.** We observed a significant increases in glucose (5.87 mmol/l (95% CI 5.76; 5.98)) and insulin (17.03  $\mu\text{IU/ml}$  (95% CI 16.03; 17, 25)) levels in patients with NAFLD and HT in comparison with similar indicators of carbohydrate metabolism in the isolated NAFLD group (5.62 mmol/l (95% CI = 5.43; 5.60); 13.84  $\mu\text{IU/ml}$  (95% CI 13.42; 14.49), respectively,  $p < 0.001$ ) and the control group (4.52 mmol/l (95% CI 4.48; 4.61); 11.40  $\mu\text{IU/ml}$  (95% CI 11, 27; 12.44), respectively,  $p < 0.001$ ). Hyperglycemia was detected in 32 patients with NAFLD and HT (50.8%), which was significantly higher ( $df = 1$ ,  $\chi^2 = 27,276$ ,  $p < 0.001$ ) than in the isolated NAFLD group, where only 3 patients (5.8%) had hyperglycemia. The HOMA-IR index in the group of patients with comorbid NAFLD and HT was 4.67 (95% CI 4.17; 4.50), and in the group with isolated NAFLD averaged 3.40 (95% CI 3.29; 3, 55), which was 2.1 and 1.5 times more than in the control group (2.28 (95% CI 2.27; 2.52)), respectively ( $p < 0.001$ ). It was found that glucose levels increased slightly with increasing systolic ( $r = 0.32$ ,  $p < 0.05$ ) and diastolic ( $r = 0.26$ ,  $p < 0.05$ ) blood pressure in the group of patients with NAFLD on the background of HT. In the meantime, the risk of insulin resistance increased significantly with increasing body mass index and waist circumference as a marker of abdominal obesity in patients with NAFLD and HT ( $r = 0.69$ ;  $r = 0.51$ , respectively), as well as in patients with isolated NAFLD ( $r = 0.52$ ;  $r = 0.46$ , respectively).

**Conclusions.** It was found that patients with NAFLD are characterized by hyperglycemia and insulin resistance. These changes are significantly exacerbated by the accession of concomitant HT and have a correlation with body weight, the presence of abdominal obesity and the BP grade. This allows us to draw conclusions about the significant negative impact of concomitant hypertension on carbohydrate metabolism in patients with NAFLD.

## Features of the expression of thymic CK14+ epithelial cells in rats in normal conditions and after prenatal administration of dexamethasone

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**Aim of the study:** The thymus morphofunctional state in newborns depends on the duration of antenatal activation of the pituitary-adrenal system, leading to increase in the content of corticosteroids in the blood. Mechanisms of thymic dysfunction are accompanied not only by the death of the lymphoid component in thymus, but also by a violation of the epithelial stroma architectonics due to changes in the expression of cytokeratins. This is key for the formation of the necessary cellular and humoral microenvironment in thymus.

**Materials and methods:** The studies were carried out on 144 white rats on the 1st, 2nd, 3rd, 5th, 9th, 14th, 21st, 30th days after birth. Three groups of 48 rats each were identified: group 1 - intact animals, group 2 - experimental group, which were injected intrauterinely with 0.05 ml of 0.4% dexamethasone solution at a dilution of 1:40; group 3 - control group, which was injected with 0,05 ml of 0.9% NaCl. The expression of receptors for cytokeratin 14 in the epithelial cells cytoplasm was assessed by a semi-quantitative method (from + to +++).

**Results:** There were no significant differences between the intact and control groups. On the 1st -3rd day after birth, in the intact group, moderate (++) expression of CK14 was detected, while in the experimental group it was determined at a low level (+). On the 5th day of postnatal period, an insignificant decrease in the level of CK14 expression was revealed in the thymus of the intact group of rats, while in the experimental group the indicator remained at the same level as compared with the previous days. On the 9th -14th days after birth, low (++) degree of expression of CK14 was revealed in the intact group, while in experimental groups of rats low (+) degree of expression of CK14. On the 21st-30th day of the postnatal period, a low degree of CK14 expression was revealed in all groups. In the subcapsular zone of the thymus, after the dexamethasone injection, epithelial cells lost contact with each other, not forming a full-fledged and differentiated network.

**Conclusions:** Thus, the introduction of dexamethasone leads to marked disturbances in the formation of an adequate microenvironment for lymphocytes, confirming that thymic epithelioreticulocytes are also target cells for dexamethasone, and can mediate the long-term effects of the glucocorticoid hormones on the fetal immune system.

## **In vitro investigation of the contractility and Ca<sup>2+</sup> transients of isolated canine left ventricular cardiomyocytes after treatment with inotropic agents**

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**Introduction:** Advanced stage systolic heart failure is a disease with high mortality and high morbidity rates. Agents that improve the contractile function of the heart play significant role in heart failure's therapy, since there are only a few drugs that meet the required level of efficiency along with safety. Direct modulation of the cross-bridge cycling is in the focus of recent studies, as well as acquiring a positive inotropic effect through this mechanism of action. Beyond the most present drug candidate, omecamtive mecarbil (OM), a previous candidate, EMD also acts via its miosin motor activating effect to achieve positive inotropy.

**Aim of the study:** Comparative investigation of positive inotropic agents' effect with different mechanism of action on isolated canine left ventricular cardiomyocytes' contractility and Ca<sup>2+</sup> transient.

**Material and methods:** Different positive inotropic drugs' ((EMD, levosimendan (Levo) and OM)) effect was investigated on freshly isolated left ventricular cardiomyocytes. Cells were loaded with Fura-2 AM calcium sensitive fluorescent dye before the experiments. We used a device that could record the changes in sarcomere shortening and intracellular calcium concentration simultaneously.

**Results:** EMD and OM significantly decreased the cardiomyocytes' resting sarcomere length, while Levo had no effect on that. As a result of administering EMD and Levo, the cardiomyocytes' contractility significantly increased, but that could not be observed in case of OM treatment. On analysis of the contractions' duration time significant prolongation was only found in case of OM. As for the kinetic parameters it was observed that Levo and EMD both accelerated contraction as well as relaxation. OM on the other hand, decelerated the cardiomyocytes's kinetic parameters when administered in high concentrations. OM has no effect on calcium transient, but EMD, and Levo resulted in higher amplitude of transients.

**Conclusion:** OM and EMD treatments significantly elevated the cells' resting tone, which implies that worsening of the diastolic function could be an adverse effect of these agents. Administering Levo did not result in such effects concerning the diastolic dysfunction.

## Predictors of self-reported physical abuse among hospitalized older adults

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**Introduction:** Elder abuse and neglect are significant and growing problems worldwide. They are global social problems that negatively affect all dimensions of the health of older adults and violate their rights.

**Aim of the study:** This study examined the 12-month prevalence of physical abuse, pertinent risk factors, and abuser characteristics among hospitalized older adults.

**Material and Methods:** In this cross-sectional study, 250 older adults (age  $\geq$  60 years) completed a researcher-designed questionnaire with a high Cronbach alpha coefficient. Chi-squared analysis and uni- and multivariate logistic regression models were used.

**Results:** Physical abuse was reported by 21.6% of the participants. The following variables emerged as independent predictors (adjusted odds ratio, 95% confidence interval) of physical abuse: age  $\geq$  70 years (4.28, 1.87–9.77), primary education (1.61, 0.44–5.93), female sex (2.50, 1.16–5.40), a low socioeconomic status (6.02, 2.38–15.26), city residence (4.18, 1.66–10.49), and the presence of a chronic disease (2.50, 1.08–5.78). The most commonly reported perpetrators of older adult physical abuse were as follows: sons (42.6%), spouses (33.3%), and cohabitants (29.6%). Furthermore, across all the different forms of physical violence, sons, spouses, and cohabitants were the primary abusers.

**Conclusions:** Elder abuse is common in Poland. Living in a city, an older age (>70 years), and the presence of chronic diseases are risk factors for most forms of physical abuse.

## **Risk and Benefit for Targeted Therapy Agents in Pediatric Phase II Trials in Oncology**

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**Introduction:** To be ethical, risk of research with human participants must be in favorable balance with potential benefits. Little is known about the risk/benefit ratio for pediatric cancer Phase II trials testing targeted therapies.

**Aim of the study:** Our aim was to conduct a systematic review with meta-analysis of efficacy and safety profiles of Phase II targeted therapy clinical trials in pediatric oncology.

**Material and methods:** Our protocol was prospectively registered in PROSPERO (CRD42020146491). We searched Embase and PubMed for cancer Phase II pediatric trials testing targeted agents. We included solid and hematological malignancy studies published between 1 January 2015 and 27 February 2020. We measured risk using drug-related grade 3 adverse events (AEs) or higher, and benefit by response rates. When possible, data were meta-analyzed.

**Results:** We identified 34 clinical trials (1,202 patients) that met our eligibility criteria. The pooled overall response rate was 24.35% (95% CI 14.50% to 34.19%) and was lower in solid tumors, 6.41% (95% CI 3.20% to 9.62%), compared with hematological malignancies, 55.09% (95% CI 35.94% to 74.25%);  $p < 0.001$ . The overall fatal (grade 5) AE rate was 1.58% (95% CI 0.63% to 2.54%), and the average grade 3/4 AE rate per person was 0.66 (95% CI 0.55 to 0.78). The major limitation of our study was a large heterogeneity of included trials. To minimize it, we separated and analyzed data by cancer type.

**Conclusions:** Despite the growing role of targeted therapy, continuous innovation and recent emphasis on precision oncology, we found that the overall response rate in Phase II targeted therapy trials (24.35%) is not much higher than the overall response rate in pediatric Phase II cancer chemotherapy trials (19.6%), and the overall fatal AE rate is slightly higher in targeted therapy trials (1.58%) compared with chemotherapy trials (1.4%). Our findings provide an empirical basis for the refinement, review of, and communication about risk and benefit in pediatric Phase II trials.

## The effects of controlled reperfusion on oxidative damage of lipids in experimental ovarian torsion

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**Introduction.** Being a medical emergency, ovarian torsion requires a prompt intervention in order to restore the blood flow and to reduce the ischemic lesions that could affect the ovarian structure and/or function. However, the detorsion maneuver is known to be associated with an increase of reactive oxygen species (ROS) production, that are responsible for molecular changes with worsening of the initial ischemic lesions. One well-known mechanism for reperfusion injury is related to lipid peroxidation. Controlled reperfusion (the on-off model) could be an option to take into consideration as there are data describing its implication in the reduction of oxidative damage and a better protection of ischemic tissue exposed to reperfusion compared with simple restoration of the blood flow.

**Aim of the study:** The aim of the study was to determine the effects of the controlled reperfusion in ovarian torsion in order to evaluate its effectiveness in the early and late stage of reperfusion assessing the intensity of lipid peroxidation process. The experimental protocol was authorized by the Research Ethics Committee of the Nicolae Testemițanu State University of Medicine and Pharmacy.

**Material and methods.** We conducted a preclinical, experimental research, which involved 70 females rats (*Rattus albicans*) that were randomly allocated into seven study groups. Each group was composed by 10 rats. 1st group: no intervention; 2nd group: only laparotomy; 3rd group: only 3 hours ovarian torsion; 4th group: 3 hours ovarian torsion and 1 hour simple reperfusion; 5th group: 3 hours ovarian torsion and 1 hour controlled reperfusion (performed the first 2 minutes from the reperfusion period, by opening and closing in 10 seconds intervals the vascular clips on the ovarian pedicle); 6th group: 3 hours ovarian torsion and 24 hours simple reperfusion; 7th group: 3 hours ovarian torsion and 24 hours controlled reperfusion. Ovarian torsion was performed by twisting the ovarian pedicle three time clockwise fixing the adnexa to the abdominal wall. Galactionova L. P., et al. method (1998), modified by Gudumac V., et al. (2012) was used to appreciate the malondialdehyde (MDA) levels in ovarian homogenates. The obtained results were analyzed using One-Way ANOVA with Tukey post-hoc test.

**Results.** The torsion induced an increase in MDA levels in ovarian homogenates by about 23% ( $p < 0,001$ ) compared to no intervention group. Simple reperfusion determined an augmentation of MDA by about 15% ( $p < 0,001$ ) after 1 hour and by about 17% ( $p < 0,001$ ) after 24 hours compared to group of rats exposed only to ovarian torsion. No statistically significant difference was observed between controlled reperfusion groups MDA levels and ovarian torsion group ( $p > 0,05$ ).

**Conclusions.** Our results show that ovarian torsion is a disease where molecules are modified due to an exacerbated oxidative stress and controlled reperfusion prevent the increase of lipid peroxidation process after detorsion procedure being helpful to minimize the reperfusion injuries due to a high level of ROS.

## **The impact of the COVID-19 pandemic on the level of physical activity and quality of life in women in the early postpartum period.**

Sabina Tim, Daria Kołomańska-Bogucka

Jagiellonian University Medical College

**Presenting author:** Sabina Tim

**Tutors:** Prof. Agnieszka Mazur-Biały

**Introduction:** Pregnancy and puerperium are a special period in the life of every woman. Depending on the trimester of pregnancy and the puerperium period, the level of quality of life and physical activity in women may change.

**Aim of the study:** The aim of the study was to analyse the level of physical activity and individual components of the quality of life in women in early childbirth in the period before and during the COVID-19 pandemic.

**Material and methods:** The 1st stage of the study was conducted from December to March 2020, while the 2nd stage was held from May to September 2020. In 1st stage participated 252 women in the 1-8th day of postpartum (Gr.Con.), in stage 2nd 262 women also in the 1-8th day of childbirth (Gr.Cov19). Average age of women from Gr.Con. was  $30.7 \pm 4.58$  years, while in the Gr.Cov19 it was  $31.4 \pm 4.36$  years. The research tools were the author's survey questionnaire, the Pregnancy Physical Activity Questionnaire (PPAQ) and The World Health Organization Quality of Life – Test Bref (WHOQOL-Bref).

**Results:** There were no statistically significant differences in the quality of life components between obstetricians giving birth before the pandemic and during pandemic ( $p > 0.05$ ). No differences were also noted in the total level of physical activity. Nevertheless, it has been observed that obstetricians from Gr.Cov19. significantly less energy compared to women from Gr.Con. spent on passive rest ( $p = 0.038$ ) and transport ( $p < 0.001$ ). In patients from Gr.Cov19. it was shown that the higher level of energy spent on sports activities and physical exercise resulted in a higher degree of somatic ( $p = 0.023$ ), psychological ( $p = 0.022$ ) and environmental ( $p = 0.025$ ) quality of life. In contrast, in women from Gr.Con. similar relationships were noted only between sports and somatic ( $p = 0.008$ ), and psychological domain of quality of life ( $p = 0.024$ ). Obstetricians from Gr.Cov19., who spent more energy on movement, had a higher level of somatic quality of life ( $p = 0.033$ ). However, it was not observed in patients from Gr.Cov19. correlations between particular domains of quality of life and the level of total physical activity. It was noticed that the energy expenditure on total physical activity, home activity and movement was significantly lower in primiparous women from Gr.Cov19. than from Gr.Con. ( $p < 0.001$ ,  $p < 0.001$  and  $p = 0.003$ , respectively). In turn, multiparous women from the Gr.Cov19 devoted significantly more energy to sports activities and exercise compared to obstetricians from Gr.Con. ( $p = 0.049$ ), while less on aspects related to transport ( $p = 0.021$ ). Moreover, in multiparous women from Gr.Cov19. a significantly lower level of social quality of life was found in comparison to multiparous women giving birth before the pandemic period ( $p = 0.019$ ). Similar relationships were not found in primiparous women.

**Conclusions:** The level of physical activity affects the quality of life of obstetricians giving birth during and during the COVID-19 pandemic.



## **The role of education and professional wound care in patients with leg ulcers**

Magdalena Antoszevska, Dorota Mehrholz, MD PhD Marcela Nowak,

Medical University of Gdansk

**Presenting author:** Magdalena Antoszevska

**Tutors:** Prof. Wioletta Barańska-Rybak

**Introduction:** Chronic wounds affect mostly elderly population and 1-2% of western population suffer from it. Leg ulcers are painful, costly and can be slow to heal what may severely compromise the quality of life.

**Aim of the study:** Purpose of our study was to evaluate health-related quality of life (HRQoL) among the patients suffering from chronic leg ulcers.

**Material and Methods:** 18 patients with leg ulcers took part in our study. Patients received a questionnaire created by authors twice. The questionnaire consisted of questions about symptoms, embarrassment, walking, use of public transport, social life, work and close relationships. Each patient filled out the questionnaire before the treatment and a month after. Patients were provided with education and professional treatment (debridement, compression therapy).

**Results:** Almost 65% of patients noticed reduction in pain. The improvement of intensity of smell was noticed in 33% of subjects. Patients reported improvement in walking. Almost 40% of patients reported less embarrassment after professional treatment. Fifty percent of patients noticed improvement in social life.

**Conclusions:** Our study shows impact of professional wound care on reduction of pain, odor, feeling of embarrassment, improvement in social life and mobility. Use of questionnaires in everyday practice may provide professionals with better insight into the health-related quality of patients' life, what can help monitor progress of the treatment.

## **Topographical peculiarities of anatomical variations in the anterior neck region during prenatal period of human ontogenesis**

Iryna Popova, Pavlo Perebyinis

Bukovinian State Medical University

**Presenting author:** Iryna Popova

**Tutors:** Prof. Tsyhykalo Olexandr

**Introduction.** Prenatal human morphology allows to complement existing data on human intrauterine development (IUD) as well as study peculiarities of various congenital malformations and anatomical variations that decrease quality of life for patients. Anterior triangle of neck is merged by inferior border of mandible, right and left sternocleidomastoid muscles (SCM) and can be subdivided into smaller regions of triangular shape above and below hyoid bone - which was the region of our scientific interest. Anatomic variations of SCM, omohyoid (OH), sternohyoid (SH) muscles as well as topographic variabilities of vascular and nervous structures are clinically valuable for surgical management of cysts, tumors and reconstructive surgeries in this area.

**Aim of the study.** The aim of our study was to investigate anatomical features of possible variants that cause congenital malformations of the neck within anterior neck region in human prefetuses and fetuses during IUD.

**Materials and Methods.** We have used a complexity of morphological methods (macro- and microscopy, dissection, morphometry and three-dimensional reconstruction) on 17 specimens of human prefetuses (3rd month of IUD) and fetuses (4-8 months of IUD). Gradation of IUD age was estimated by parieto-coccygeal length (PCL). Material was obtained in accordance with ICH GCP (1996 p.) and The Declaration of Helsinki (1964-2008).

**Results.** We have observed an asymmetry of right and left SH muscles in the 3rd month prefetus (70,0 mm PCL), accompanied by shortened width of the left SH within the omotracheal triangle. In another 3-month-old human prefetus (80,0 mm PCL) SCM, besides two heads of attachment (anterior - towards posterior-superficial surface of sternum and posterior - towards posterior surface anterior 1/3 of clavicle) had additional belly, that was attached towards middle 1/3 of the clavicle, consisting predominantly of fibrous connective tissue (comparing to the «classical» bellies). In one specimen of fetal period of the IUD (200,0 mm PCL fetus, 6th month of IUD) OH didn't show any present of the intermediate tendon between the superior and inferior belly, which is why OH course was straight in the middle portion. Such findings may be relevant to the reconstructive surgeries of the mouth floor of the larynx, as OH is usual substrate of such. Moreover, absence of the connective intermediate portion within OH influences morphometric and topographic indexes for both carotid and omotracheal triangles in the anterior region of the neck.

**Conclusions.** 1. We may conclude that the most common anatomical variations that may be observed within the anterior portion of neck during late IUD are connected with morphological dysmorphism of neck muscles which may occur due to deficient separation processes during early embryological phases. 2. We suggest our findings as valuable complementation for improvement of surgical tactics in anterior neck region.

## Effect-site concentration of propofol and remifentanil during Bispectral index - guided general anesthesia - a pilot study

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**Presenting author:** Róża Krycińska

**Tutors:** Prof. Jerzy Wordliczek

**Introduction:** Direct and continuous monitoring of the brain activity, as well as meticulous drug titration, significantly refines safety and proper delivery of patient care during general anesthesia. The bispectral index (BIS) monitors record the EEG signal over the forehead, which is processed in near real-time and presented as an index value ranging between 0 and 100, indicating the patient's depth of anesthesia. Target Controlled Infusion (TCI) systems are automated tools to optimize the administration of hypnotic and analgesic intravenous agents using pharmacokinetic and pharmacodynamic models of data on drug-concentrations and drug-effects in a standardized population of patients. TCI models enable adjustments of the infusion speed to reach and maintain the requested concentration of the drug in the blood or at the effect-site.

**Aim:** This study aimed to determine the value of predicted effect-site propofol concentration according to Schnider model and the value of Bispectral Index (BIS) at a loss of consciousness (LOC) and a return of consciousness (ROC) in patients undergoing combined remifentanil-propofol general anesthesia.

**Material and methods:** Fifteen consecutive patients, female/male 10/5, ASA physical status I - III, aged 25-69 years, scheduled for an elective surgical procedure under general anesthesia, were enrolled to receive a propofol-remifentanil total intravenous anesthesia using effect-site targeting with Schnider and Minto models. Patients received a "stair-case" computer-controlled infusion of propofol with the initial effect-site concentration of 1.0 µg/ml and an increase of 1.0 µg/ml every 4 min. Propofol effect-site concentrations and BIS values were recorded at the loss of consciousness (LOC) and the return of consciousness (ROC) with the remifentanil effect-site concentration of 2 ng/ml.

**Results:** For LOC and ROC, the median (IQR) effect-site concentration of propofol was 1.8 (1.4–2.1) µg/ml and 1.2 (0.9–1.65) µg/ml respectively. LOC occurred at the median (IQR) BIS value of 71.2 (71–73.4) and ROC at the median (IQR) BIS value of 68.2 (62.2–70.4).

**Conclusion:** Both propofol effect-site concentration and BIS value at LOC and ROC were influenced by the administration of remifentanil. Still, LOC and ROC occurred within a defined range of effect-site concentrations predicted with Schnider model.

**Neurophysiological parameters of the premotor cortex inhibition processes after transcranial magnetic stimulation treatment in patients with Parkinson's disease stage II living in the Zaporizhzhya region**

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**Presenting author:** Alina Viktorivna Demchenko

**Tutors:** Prof. Iina Viktorivna Demchenko

**Introduction:** Parkinson's disease (PD) is a neurodegenerative disease that clinically manifests by a combination of motor and non-motor symptoms, which are caused by a complex neurotransmitter dysfunction. Modern principles of PD treatment include not only pharmacotherapy, but also non-drug methods. Particularly, transcranial magnetic stimulation (TMS) is actively used in the treatment of PD. Motor symptoms affect the social and domestic activity of patients with Parkinson's disease, and therefore require monitoring of the dynamics of symptoms changes after prescribed therapy. Neurophysiological parameters of the motor evoked potential silence period are sensitive markers of the cerebral cortex inhibition processes, which are of particular importance in terms of the severity of motor symptoms clinical manifestations.

**Aim of the study:** to determine changes of the premotor cortex inhibition parameters in patients with PD stage II after a course of TMS treatment.

**Materials and methods:** 45 patients with PD stage II according to Hoehn-Yahr were examined. Additionally to basic PD therapy, all patients were prescribed a course of therapeutic TMS sessions in C3, C4 and Cz zones of the brain with a pulse rate in the series of 5 Hz for 8 minutes, 10 sessions per course. To study the parameters of cortical inhibition the neuromyograph with registration of the muscular response in m. abductor pollicis brevis bilaterally with mild muscle contraction was used. The motor control index (MCI) was also investigated, which characterizes the degree of increase in the latency of the silence period against the background of increasing the power of the magnetic stimulus and reflects the efficiency of inhibition processes in the motor control system. Patients were examined twice (at the beginning and in the end of TMS treatment) using neurophysiological study: determining the latency of the silence period of motor evoked potential (MEP) and calculating the MCI.

**Results:** before TMS treatment, the latency of the silence period of the MEP of the premotor cortex was  $141.6 \pm 3.23$  ms on the left and  $156.7 \pm 3.72$  ms on the right with the MEP threshold of 50%. When the MEP threshold was raised to 80%, the duration of the silence period increased to  $227.3 \pm 3.87$  ms on the left and  $241.1 \pm 4.07$  ms on the right. In addition, the MCI was additionally calculated, which was 0.62 on the left and 0.64 on the right. After the course of TMS there was a significant ( $p < 0.05$ ) increase in the latency of the silence period with the threshold of MEP 50% to  $157.6 \pm 3.61$  ms on the left and  $163.1 \pm 3.43$  ms on the right. There was also a tendency to insignificant increase in MCI, which was 0.64 on the left and 0.67 on the right after a course of therapeutic TMS.

**Conclusions:** after a course of therapeutic TMS in the examined patients with Parkinson's disease stage II, there was an activation of the premotor cortex inhibition processes bilaterally, which manifested by a significant increase in the duration of the silence period of MEP

## **Project of improved posthospital patient care system using telemedicine technologies for patients after total hip arthroplasty**

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**Presenting author:** Karolina Kamecka

**Tutors:** Prof. Remigiusz Kozlowski, PhD Anna Rybarczyk – Sz wajkowska

**Introduction:** The importance of telematics technologies use in medicine around the world is in unique rapid growth phase due to the SARS-CoV-2 pandemic. How can high technologies improve posthospital patient care process after total hip arthroplasty? In the case raised in the study, the knowledge in areas such as medicine, management, IT, electronics and telecommunications is needed. In practice, it is necessary to create interdisciplinary teams to design and implement improved procedures using telemedicine tools.

**Aim of the study:** The aim of the study is to create improved posthospital care system after total hip arthroplasty (THA) as a result of the use of telemedicine technologies by the patient at home, both visual and wearable technologies. An interdisciplinary team within InterDoktorMen project dealt with the creation of a posthospital care process by patient care at home after THA as a result of the use of telemedicine technologies and identified possible improvements in the posthospital care process.

**Material and methods:** In the research critical analysis of: the literature, of the current posthospital care process and complexed care model of Agency of Health Technology Assessment and Tariffs, as well as analysis of the available technologies and participant observation were conducted. Due to the specificity of the studied process, two types of benchmarking solutions have been distinguished and described, which are used in orthopedics, but also in other fields of medicine.

**Results:** Project of improved, original posthospital patient care system using telemedicine technologies for patients after THA was designed. The process complies hybrid approach to patient care process, taking into account both stationary patient care procedures and remote monitoring of parameters, i.e. activity level or collapse detection and home-based telerehabilitation, as well as remote visual patient-specialist contact.

**Conclusions:** Modern technologies offer a wide range of possibilities to improve patient care after surgical operations. The current posthospital patient care process after THA does not respond on SARS-CoV-2 pandemic, revealing strong needs on remote contact and patient monitoring. Application of an improved project of the posthospital care process after THA, will have a positive impact on effects of recovery and home-based rehabilitation process, increase of patient's safety and reduction of the risk associated with postoperative complications. Telemedicine technologies implemented to patient care process stand as useful monitoring and therapeutic tools. Our analysis should be treated as an introduction to wider research with participation of medical staff, patients after THA and patient caregivers.

## **Synonymous mutations in the peptidylarginine deiminase gene from *P. gingivalis* and their potential impact on bacterial virulence**

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**Introduction:** A major etiologic factor of periodontitis (PD) is an anaerobic bacterium, *Porphyromonas gingivalis* (Pg). Recently, considerable interest has been focused on peptidylarginine deiminase (PPAD) from Pg, an enzyme which catalyzes conversion of arginine to citrulline. Our recent results imply PPAD activity as a critical factor in gingival cell infection and prostaglandin E2 induction. Synonymous mutations may affect the translation process, however their presence in PPAD gene and potential impact on Pg virulence has not been studied.

**Aim of the study:** Identification and analysis of the synonymous mutations in the PPAD gene from Pg clinical isolates obtained from PD donors.

**Material and methods:** Gingival crevicular fluid samples were collected from 20 PD patients and 10 healthy controls (Ctrl) and grown under anaerobic conditions until Pg subcultures were obtained for genomic DNA isolation. Presence of Pg was confirmed by 16S rRNA and PPAD PCR. PPAD coding sequences were amplified, cloned into pTZ57R vector, amplified and sequenced using Sanger method. The sequences obtained were aligned with PPAD sequences of strains deposited in GenBank database. The bioinformatics analysis was performed using the National Center for Biotechnology database, the BLAST nucleotide program and the Microsoft Office.

**Results:** Thirty five synonymous mutations were identified in the PPAD gene encoded by Pg strains from PD and 22 from Ctrl. Substitution of cytosine to thymine (C->T) at positions g.378, g.405, g.741, coding amino acids present close to the active center of PPAD was detected exclusively in the PD group. The A->G, G->A, A->C and C->T substitutions at positions g.735, g.912, g.1035, and g.1080, respectively were identified in the proximity of the active site of PPAD in the Pg strains from Ctrl. The most frequent substitution in both groups was the replacement of cytosine by thymine (g.948), while the least frequent one was substitution of thymine by adenine (g.1422).

**Conclusion:** Our study revealed significant heterogeneity of synonymous substitutions in the PPAD gene from Pg strains in the Ctrl group, that was in contrast to PD group, where exclusively the substitutions of cytosine by thymine were detected, all coding amino acids present close to the active center of PPAD. The presence of specific synonymous mutation alone or in combination with any missense mutation or polymorphic variant of PPAD, in particular located close to the catalytic triad may affect PPAD function and thus have an impact on bacterial virulence.

## **PHYSIOTHERAPY**

### **COORDINATORS:**

Julia Michalak

Bartłomiej Rzepecki

### **JURY:**

Prof. Elżbieta Miller MD PhD

Anita Sikora-Szubert MD PhD

Prof. uczelni Joanna Kostka MD PhD

## Balance assessment in stroke patients using a stabilometric platform CQ-Stab and a Timed Up and Go Test

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Medical University of Lodz  
**Presenting author:** Klaudia Marek  
**Tutor:** Prof. Elżbieta Miller

**Introduction:** Stroke is the most common disease of the central nervous system. The consequences of vascular disease are balance disorders and an increased risk of falling while walking.

**Aim of the study:** The main goal of the research work was to assess the balance after stroke using the CQ-Stab stabilometric platform and the Timed Up and Go test. A sub-objective was the assessment of the quality of life

**Materials and methods:** The research was carried out on 28 stroke patients (hemorrhagic and ischemic). Patients were divided according to age. The first group consisted of 9 people (4 women and 5 men) aged 55-64, while the second group consisted of 19 people (12 women, 7 men) aged 65+. The research was carried out at the III Miejskie Centrum Medyczne im. dr. Karola Jonschera in Lodz. The balance test was carried out on the CQ-Stab stabilometric platform. The activities were performed with eyes open and closed. Additionally, the Timed Up and Go test was carried out. The research used a personal questionnaire for patients after a stroke. In addition, the body mass index was examined and the scales to assess the quality of life - ADL and IADL were used.

**Results:** In group I, stroke was more common in men than in women as opposed to group II, where stroke was more common in women than in men. A stroke occurred twice as likely in people aged 65+ than those aged 55-64. In both groups I and II, the greatest number of patients had a stroke less than a month ago. In both groups, patients most often had only one stroke at a lifetime. The left side was a more common side affected by stroke, while in group II, the right side. Both in group I and II, the most frequent accompanying diseases were - arterial hypertension and diabetes. In group I as many as 89% of patients used to smoke cigarettes in the past, while in group II smoking was equivalent to the history of never smoking cigarettes by the respondents. Most of the respondents in groups I and II considered their level of physical activity low. As many as 78% of respondents in group I didn't use orthopedic equipment, while in group II, the use of crutches with no orthopedic equipment was equivalent. BMI Summary-Both groups I and II were overweight, Scales-Both the ADL and IADL scales were dominated by the highest scores, Timed Up and Go test: In group I, the most common result was 1-10s, then 11-15s, while in group II, on the contrary, the dominant result was 11-15s, and then 1-10s, and 16-20s and 20s +, the balance tests performed on the CQ-STAB stabilometric platform: Research for group I with eyes open for left and right side (EOL/EOP)  $p = 0.58$ , with eyes closed  $p=0.21$ , for group II with eyes open for left and right side (ECL/ECP)  $p=0.0005$ , with eyes closed,  $p=0.01$ .

**Conclusions:** Balance after a stroke aged 65+ deteriorates, After stroke the quality of life deteriorates, The risk of falling while walking after stroke is low according to the Timed Up and Go Test, Overweight, age 65+, hypertension, diabetes, low physical activity, smoking are factors that predispose to the appear of a stroke.



## **The relationship between body posture and Functional Movement Screen scores among children aged 7-15 years during Pandemic Covid-19 - a pilot study**

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**Presenting author:** Stanisław Budecki

**Tutor:** M.Sc. PhD Katarzyna Glibov

**Introduction:** The available literature indicates that the problem of postural defects affects 30-69% of the studies population. According to Zeyland-Malawka correct posture is a body alignment that results from the anatomical structure and habitual arrangement of its elements, favoring the basic functioning of the body. Functional Movement Screen test (FMS) is used to evaluate the movement pattern, body symmetry and allows us to find the weakest link in the kinematic chain. The FMS consists of 7 tests that assess mobility, neuromuscular control, balance and stability using movement patterns. With the Covid-19 pandemic in Poland, the percentage of physical activity in children has dramatically decreased. This is due to remote learning, online physical education classes as well as limited access to after-school sports activities and recreation.

**Aim of the study:** The aim of the study was to evaluate the relationship between children's body posture and physical performance during the Covid-19 pandemic.

**Material and Methods:** The study was conducted between November and December 2020 and included 93 children from all over Poland (59 boys and 34 girls), mean age 10. Body posture was assessed according to Kasperczyk's point scale and physical performance was evaluated with the use of Functional Movement Score. Statistical analysis was performed using Microsoft Excel 2010 program.

**Results:** The average score obtained in posture evaluation according to Kasperczyk method was 8.52. Only in 11 out of 92 examined children the score was lower than 5. The greatest deviations from the correct alignment concerned shoulders (89.25%) and shoulder blades position (85.87%). Equally frequent deviation from normal was observed in abdominal alignment (76.09%), foot arches (73,12%) and heel and shank alignment (65,59%). Rotational stability was the biggest problem in FMS tests for examined group – 86% of them scored less than 3 points. In the FMS test, the lowest scores were recorded in the left limb rotational stability test (mean score 1,95) and the right limb rotational stability test (mean score 1,99), and in the ASLR test (mean score 2,10).

**Conclusions:** The frequency of abnormalities in the posture among children aged 7-15 years during pandemic Covid-19 is high. Abnormalities of posture most often concern shoulder and shoulder blades. The highest frequency of abnormalities in FMS testing relates to rotational stability. Further research is needed for early detection of postural defects and implementation of therapeutic interventions.

**Women's knowledge and compliance with preventative measures dedicated for women during the postpartum period, which facilitate a more rapid return to the condition before pregnancy.**

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**Tutor:** Prof. Agnieszka Mazur-Biały

**Introduction:** Many changes occur in a woman's body during pregnancy. Despite the positive emotions associated with anticipation of childbirth, it can also be a stress-inducing factor. Stress can cause a number of complications, both during pregnancy and postpartum period. It is possible to counteract these complications by introducing appropriate physical therapy within the first days after labour. Preventative measures include activities which facilitate a more rapid return to the condition before pregnancy.

**Aim of the study:** Assessment of women's knowledge and compliance with preventative measures dedicated for women during the postpartum period, which facilitate a more rapid return to the condition before pregnancy.

**Material and methods:** The study was conducted in two parts in a gynaecological ward. The first part of the study took place between June and July of 2019, the second part was conducted in January and February of 2020. 80 women in the first and second day of the postpartum period took part in this study. Participation was voluntary and anonymous. An authorial questionnaire was used to assess the patients' knowledge. The questionnaire included questions regarding pregnancy, current complaints and behaviours in the postpartum period. After providing answers to these questions, patients were also instructed by a physiotherapist about recommended preventative measures.

**Results:** Women's knowledge regarding behaviours recommended by physiotherapists during the postpartum period is low. Over 90% of puerperas have never heard about exercises stimulating lactation. 30% of patients claimed that they have heard about the prophylaxis of linea alba, however only 10% declared applying it. Similar results were obtained regarding antithrombotic exercises – over 70% of patients were not familiar with this type of exercises and only 15% confirmed performing them. Over 80% of puerperas declared that they knew about pelvic floor muscles and in 10% of cases their knowledge came from medical staff. It was observed that women during pregnancy perform pelvic floor exercises two times more often than non-pregnant women. Over 40% of puerperas apply this preventative measure.

**Conclusions:** Women's knowledge regarding advised behaviours in the first days of postpartum period is very little. It is necessary to educate women in procreational age and to conduct further studies with a larger experimental group.

## Foot posture among children from 7 to 14 years old during Covid-19 pandemic.

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**Presenting author:** Adrianna Franczyk

**Tutors:** M.Sc. PhD Katarzyna Glibov, M.Sc. Adam Konstanty Markiewicz

**Introduction:** The proper posture of the foot determines correct body posture. Any deviation within the foot can affect other parts of the lower limb and, thus, the rest of the body. Observation and early correction of the potential defects are very important, especially during childhood and adolescence. The Covid-19 Pandemic and associated hypokinesia among school aged children might have an impact on proper foot alignment.

**Aim of the study:** The aim of the study was to analyze the posture of the foot among children during Covid-19 Pandemic.

**Material and methods:** The study involved 93 children aged 7 to 14 years old, including 63 boys (68%) and 30 girls (32%). The height and weight of each child was measured and the BMI was calculated. Plantographic analysis was used to described foot posture. Length, width, Clarke's angle and hallux valgus alfa angle of each foot was measured. "W" Wejsflog index was calculated.

**Results:** The average BMI was 18,2 for girls and 17,5 for boys. The average value of Clarke's angle was 48,2 degrees for right feet and 49,3 degrees for left feet in the group of girls. For boys the average value of Clarke's angle was 45,3 degrees for right feet and 44,7 degrees for left feet. The average Wejsflog index was 2,7 for girls and 2,8 for boys. The average value of hallux valgus alfa angle was 0 degrees for both boys and girls.

**Conclusions:** The study did not reveal any significant deviations from the norms of tested parameters.

**The assessment of selected parameters of children's aged 7 to 14 body posture during the COVID-19 pandemic depending on the time spent in front of the computer screen and children's additional physical activities.**

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**Introduction:** Online teaching introduced during the COVID-19 pandemic extended the time spent in front of the screen by students. According to the data collected in interviews with parents, it turned out that children spend their teaching-learning time sitting, without any additional physical activities. Importantly enough, it was decided to verify whether children's aged 7 to 14 current lifestyle causes abnormalities in their body posture.

**Aim of the study:** To determine how much time children spent on remote learning during the COVID-19 pandemic. To investigate whether the time spent in the sitting position contributed to the occurrence of postural abnormalities. To determine whether there was a relationship between the occurrence of posture abnormalities and reduced children's physical activity.

**Material and methods:** The study included 69 children without comorbidities (23 girls and 46 boys) aged 7 to 14 within the "SOS for the spine" project. The randomly selected group of children was chosen on the basis of the submitted applications. The children's posture was assessed with the use of Kasperczyk Scale, a scoliometer and an inclinometer. The diagnostic tests, the measurement of height, weight, limb length and body circumference, podoscopic examination of feet, the ultrasound of paraspinal muscles and FMS test were performed. For the purposes of the study, the results from the Kasperczyk Scale and the data collected in the interview were used.

**Results:** In the entire group of examined children, the frequency of changes in body posture was 100%. According to the Kasperczyk Scale, each child had at least one deviation from the correct state. A significant relationship between the lack of performed physical activities and the occurrence of posture abnormalities was found. The protraction of shoulder position occurred in case of 94% of patients, asymmetries within the position of the shoulder blades were observed among 86% of the examined patients. The lordosis deepening was noticed among 65% of patients and the lateral curvature of the spine among 58%. There was a significant correlation between the lack of additional activity and the aggravation of lumbar lordosis and the asymmetry of the waist angles. There was also a link between the time spent in a sitting position and improper positioning of the head and shoulders. In the group of examined children, the time spent in front of the screen ranged from 4 to 5 hours among children aged 7 to 9 and up to even 16 hours among the older children involved in the study. The average of time spent on sitting was almost 8 hours.

**Conclusions:** The examined group of children spent, on average, about 8 hours a day in front of the monitor, which is several times more than the recommended time for children of this age. As the time spent in the sitting position increased with the introduction of remote learning, the number of postural irregularities increased. As the time devoted to additional physical activity decreased, the number of postural irregularities increased.

## The assessment of diastasis recti abdominis using rehabilitative ultrasound imaging

Beata Czechowska

Medical University of Łódź

**Presenting author:** Beata Czechowska

**Tutor:** M.Sc Phd Katarzyna Gilbov

**Introduction:** One of the major problems faced by women after birth is the diastasis of recti abdominis (DRA) caused by the dysfunction of linea alba connecting two parts of the muscle. According to the literature it occurs in nearly 53% of postpartum women and in 36% of them it does not repair naturally and requires a therapeutic process. The causes of the DRA include obesity, high birth weight, large volume of fetal water, multiple pregnancies, consecutive pregnancies, excessive abdominal muscle work mainly in the third trimester. One of the consequences of DRA in women is the abnormal tension of the abdominal muscles which may contribute to the occurrence of lumbar pain, postural defects or hernia. This is a significant health problem for women and also has an aesthetic and emotional impact.

**Aim of the study:** The aim of the study was to assess the incidence of the diastasis of recti abdominis in postpartum women using rehabilitative ultrasound imaging (RUSI) and to analyze factors of its occurrence.

**Material and methods:** Twenty postpartum women, aged between 31 years and 41 years, participated in the study. Studied group included women who were after one, two or three deliveries, both natural and caesarean sections. The study consisted of 3 parts: medical interview, postural assessment and manual examination of the linea alba and the evaluation of the thickness and width of the linea alba during rest and activity in a lying and standing position with the use of ultrasound imaging.

**Results:** Twenty postpartum women participated in the study, including 9 women who had a natural childbirth, 9 women who had a caesarean section, and 2 women who had one natural childbirth and one caesarean section. In the study group there were 6 women after one birth, 10 after two births and 4 after three births. Among the participants of the study, 70% of the women declared that they have a sedentary job, the remaining 30% had a mixed job. Nearly 60% of the women were physically active and as many as 40% do not practice any physical activity. The occurrence of pain in the lumbar region of the spine was reported by as many as 60% of the surveyed women. The study showed that the average width of the linea alba in postpartum women above the umbilicus at rest was 21.5 mm and during activation - 18.67 mm. The values for the mean width below the umbilicus were as follows: at rest 11.11 mm and during activity 8.1 mm.

**Conclusions:** Rehabilitative ultrasound imaging is an effective diagnostic method for the DRA assessment in women. Rehabilitative ultrasound imaging allows assessment of the morphology and activity of the linea alba."

## **Assessment of physical activity and mental health of climbers in the era of epidemic threats in connection with the SARS-CoV-2 coronavirus**

Paulina Skucińska

Jagiellonian University Medical College Assessment of physical activity and mental health of climbers in the era of epidemic threats in connection with the SARS-CoV-2 coronavirus

**Presenting author:** Paulina Skucińska

**Tutor:** MD Phd Alicja Jurecka

**Introduction:** Physical activity is defined by the World Health Organization (WHO) as body movement related to the work of skeletal muscles and energy expenditure. Regular physical activity reduces the risk of non-communicable diseases: cardiovascular diseases, diabetes, cancer and also has a positive effect on mental health. Physical inactivity is the fourth leading risk factor for mortality worldwide, accounting for 6% of all deaths. Among healthy adults aged 18-64, WHO recommends 150 minutes/week of moderate or 75 minutes/week of intense physical activity. The types of physical activity can be represented by metabolic equivalent (MET), which is the resting metabolic rate, the amount of oxygen used by the body in a calm sitting position 1 MET for a person weighing 70 kg is on average 3.5 ml O<sub>2</sub>/kg/min, which is equal to 1.2 kcal/min at all. This makes it possible to classify the effort into three groups of activity: low, moderate and high. COVID-19 is a disease caused by the SARS-CoV-2 coronavirus. Symptoms of infection mainly affect the respiratory tract, therefore lead to respiratory failure and even death. In Poland, the state of the epidemic has been in force since March 20, 2020. Due to the increase in the number of infected people in the following months, the Polish government began to introduce restrictions related to the limitation of using public space. The restrictions concerned climbing walls, swimming pools, fitness clubs and gyms.

**Aim of the study:** The aim of the study was to assess the physical activity and mental health of climbers during the epidemic of the SARS-CoV-2 coronavirus.

**Material and methods:** The research tool was an electronic questionnaire. The questions were developed on the basis of the International Physical Activity Questionnaire (IPAQ) and the Profile of Mood States (POMS). 53 people, 20 women and 33 men participated in the study. The mean age of the respondents was 32.53 years (SD 32.53 ± 8.595). For the analysis of the results, statistical tests were used: Kolmogorow-Smirnow, t-Student and Wilcoxon. The level of statistical significance was  $\alpha = 0.05$ .

**Results:** The study showed a statistically significant result for POMS. The mean point value of the POMS scale during the epidemic was 56.83, while before it was 43.38. The result obtained in the IPAQ was not statistically significant. The median value of the IPAQ during the pandemic was 4582.5, while before it was 5295. At last, average minutes of time spent sitting during the day in the pandemic was 444.76, compared to 398.57 before.

**Conclusions:** The SARS-CoV2 coronavirus epidemic and its related exacerbations had an impact on a decrease in the value of total weekly physical activity in climbers, as well as a deterioration of the mental condition. In the era of the pandemic, the time spent in a sitting position has increased, which may be the reason for remote work.

## **Medical staff's state of knowledge on physiotherapist profession in the light of changes introduced by the Act of 25 September 2015**

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**Presenting author:** Ksenia Skrobek

**Tutors:** M.Sc Beata Czechowska, M.Sc Marta Karbowskiak, M.Sc PhD Katarzyna Glibov

**Introduction:** The profession of a physiotherapist is gaining popularity every year in Poland. The Act of 25 September 2015 introduced many changes that undoubtedly influenced current status of physiotherapists. Because of its regulations the physiotherapist profession has become an independent medical occupation. Furthermore, the rules of vocational training and postgraduate education, obtaining a right to pursue a profession and professional liability were defined.

**Aim of the study:** The purpose of this research is to analyze and evaluate the knowledge of medical workers employed in hospitals in Lodzkie Province concerning physiotherapist profession in the light of changes introduced by the Act.

**Material and Methods:** The study included 563 medical workers from district (n=188), province (n=185) and nationwide (n=190) hospital. The main participants of the study were representatives of nursing staff (355 people) as well as the doctors (116 people). The remaining part of interviewees were representatives of: paramedics, cleaners, midwives, health carers and laboratory diagnosticians. The study was conducted using self-written questionnaire.

**Results:** Nearly half of the interviewees (48%) claims that the person eligible to conduct a rehabilitation is a rehabilitator, but only 34,6% claims that person is a physiotherapist. For as many as two thirds of the respondents thinks a physical therapist and a physiotherapist are synonyms. About 20% of respondents should update their knowledge that in the light of the new Act the physiotherapist is an independent medical profession. 3/5 of respondents are aware that the education of a physiotherapist continues for 5 years. The vast majority of respondents (90%) rates the responsibilities of a physiotherapist as, primarily, kinesthetic rehabilitation and re-education of gait. A big part of respondents is not aware that the competence scope of physiotherapists includes also anti-bedsore prophylaxis (over 70% of respondents) as well as the selection of supplies (nearly 49%). 74% of interviewees admits that medical staff is ought to be educated on use of physiotherapy, and 76% admits that a physiotherapist should be a part of every therapeutic team.

**Conclusions:** Despite several years passing since enacting a law of physiotherapist profession act, the medical staff's state of knowledge regarding that matter still requires updates. It could significantly affect the atmosphere in the therapeutic team and improve the treatment of patients. Cooperating professions should be aware of their responsibilities and competence scopes to avoid misunderstandings and conflicts. It should be noted that three quarters of respondents notices a need of further education in that aspect.

## **PSYCHIATRY AND PSYCHOLOGY**

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## **Masturbation and sexual life among polish Internet users**

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**Introduction:** "In the past, it was once believed that masturbation should not be practised, as it may be a cause of neuropsychiatric disorders. In present according to World Health Organisation attitude masturbation is included as part of normal child development and it aids to discharge the sexual tension in adults. The amount of research and data in literature about importance and spread of masturbation is still insufficient.

**Aim of the study:** The aim of this pilot study was omni-directional analysis of masturbation including gender differences and influence of mentality or religion.

**Method:** The study was based on anonymous, over the Internet survey composed of 25 closed-ended question. It started in 2020 and still goes on. So far 1201 men and 1011 women get involved.

**Results:** Among masturbating men 25% (n=301) have sexual disorder during intercourse, mostly 11,5% (n=137) erectile dysfunction and 8% (n=98) excessive sex drive. Among masturbating women 36,5% (n=365) have sexual disorder during intercourse, mostly - 20% (n=207) dyspareunia and 14% (n=138) vaginal dryness. COVID-19 pandemic has no effect on masturbation frequency in 60% (n=1313) participants, in 26% (n=563) participants it increased frequency and in 14% (n=300) decreased frequency.

**Conclusions:** The research has shown that men masturbate more often than women, from the other hand women have sex more often than men.

## Prevalence of dementia in elderly age population of Barangay Bangkal, Makati City

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**Introduction:** Dementia, a significant cause of disability and dependency among older adults, requires urgent attention and care. The growing population of the elderly in the Philippines is expected to increase the prevalence of dementia in the country. It is a clinical diagnosis requiring new functional dependence based on progressive cognitive decline and represents a departure from previous mental functioning. Usually, dementia is of a chronic or progressive nature, characterized by deterioration in memory, thinking, behavior, and the capacity to make daily living (World Health Organization, 2019). Globally, around 50 million individuals have dementia with the majority of dementia cases reported from low or middle-income countries. This number is expected to rise to 82 and 152 million by 2030 and 2050 respectively. In 2015, it was estimated that dementia resulted in US\$818 billion of global societal costs. In Asia-Pacific countries, including the Philippines, the cost was estimated at US\$185 billion for 2015. Dementia grossly affects the physical, mental, and social aspects of health and health quality, contributing to a higher economic burden.

**Aim of the study:** This study aims to determine the prevalence of dementia in the elderly population of Barangay Bangkal, Makati City.

**Material and methods:** Descriptive cross-sectional community-based study was conducted to determine the prevalence of dementia in the elderly population of Barangay Bangkal, Makati City, aged 60 years and above over one month from mid-October to mid November 2019. Data was collected with help of Mini-Mental State Examination – Philippines version (MMSE-P) to determine the cognitive status and diagnose dementia in elderly population.

**Results:** A total of 266 elderly adults participated in the study. Representatives of the study population were male (59.0%), married (68.0%), with an income of less than 5,000 peso (51.1%), working (64.3%), and with high school education (42.1%). The average age of the study population was 68.02 (+ 6.76) years. The average MMSE score of the participants was 27.05 (+ 3.94). The prevalence of dementia in the sample was 18.8%. Age, income, and level of education were associated with the MMSE score ( $r = -0.26$ ,  $n = 266$ ,  $p < 0.001$ ,  $r = 0.23$ ,  $n = 266$ ,  $p < 0.001$ , and  $r_s = 0.19$ ,  $n = 266$ ,  $p = 0.002$ , respectively). The findings for statistical significance do resonate with clinical significance as evident during administration of MMSE score.

**Conclusion:** The prevalence of dementia in the elderly age population of Barangay Bangkal, Makati City, is relatively high at 18.8%, with the majority reporting mild and moderate dementia. Advancing age is linked with increased risk for cognitive decline, while higher income and education levels have preventive dementia effects. The baseline data obtained in the current study can be used to design health policies in the barangay. However, these results should be interpreted with caution because of the relatively small sample size.

**The relation between patient and his doctor -  
unexpected grey eminence of effective treatment**

Katarzyna Rakoczy

Medical University of Wrocław

**Presenting author:** Katarzyna Rakoczy

**Introduction:** Doctor, from the perspective of a patient, is a person of a great wisdom that has a power to help the others regain their health and strength. The relation that is formed between the person that is uncertain about the future due to the illness and the person who has chosen bringing the others that significant certainty back, is crucial when it comes to the effectiveness of a treatment. Although the envoy of helping the others delights with its ideological tenor, private lives of the doctors should not be neglected.

**Material and methods:** Analysis of Medical Code of Ethics, reflection on the localization of the border between empathy and individuality, interviews with medicine students, patients and clinicians.

**Results:** Patients, who have had friendly relationships with their doctors tend to convalesce in a shorter time whereas doctors, who address their patients instead of neglecting their problems, are more professionally fulfilled.

**Conclusions:** The wisdom of philosophy lets us state the conclusion that the proper understanding of the envoy of medicine is the foundation of the doctors' relevant attitude towards patients. Empathy, especially in clinical reality, should never be replaced by apathy, however the border between helping other people *tutus viribus* and doctors's interests and targets must be stated as early as possible in order to find the golden mean, which on the one hand prevents working life from professional burn-out while on the other and saves the doctor's personal life from disappearing. Personalized perception of the beauty of medicine, which might be described as the mission of shielding the flame of hope that is burning in patients' hearts, gives the character of the relation between patient and his doctor the proper significance.

## **The prevalence of depressive symptoms in hemodialysis patients who recovered from COVID-19**

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**Presenting author:** Martyna Stanisławska

**Tutors:** Prof. Michał Nowicki

**Introduction:** Mood disorders, including anxiety and depression, are highly prevalent among chronic dialysis patients. The outbreak of COVID-19 may be stressful. It has been recently found that nearly 1/5 of COVID-19 patients developed mental health issues like depression, anxiety, or dementia within 3 months of diagnosis.

**Aim of the study:** To compare the prevalence of depressive symptoms in hemodialysis patients who recovered from COVID-19 to those who had not contracted this disease.

**Material and methods:** The study included chronic hemodialysis patients with at least 4-week history of chronic dialysis therapy, treated in two large dialysis centers in Central Poland. Beck Depression Inventory (BDI) questionnaire was used as a screening test for depression. The patients were also asked to complete a 22-item questionnaire designed by researchers to gather information on age, gender, education, dialysis duration, comorbidities, current medications, and attitudes towards influenza and COVID-19 vaccination.

**Results:** 72.4% of patients who were proposed to participate in the survey agreed to take part and answered all the questions, 21.9% admitted that they were unwilling and 5.7% claimed that they would like to participate, but at that moment they were too tired.

Eventually the study group included 63 patients (27 women and 36 men, mean age  $62.4 \pm 13.9$  years). 25 patients (39.7%) recovered from COVID-19. According to the Beck Depression Inventory, 27 (43%) patients from the whole group were at high risk of depression.

The Beck Depression Inventory score was significantly higher in the patients who recovered from COVID-19 than in those who have not contracted the disease ( $13.4 \pm 9.1$  vs.  $8.7 \pm 6.8$  points;  $p=0.04$ ). 85.7% patients were willing to be vaccinated against the coronavirus. 97.4% of patients who have not suffered from COVID-19 were willing to get vaccinated against it, while only 31.5% of those who have contracted COVID-19 were willing to get vaccinated ( $p=0.01$ ).

79.4% of respondents have a negative attitude towards influenza vaccines. There were no differences in the attitude towards influenza vaccination in people who contracted COVID-19 (84%) or not (76.3%).

64% of subjects who recovered from COVID-19 claimed that their approach to vaccination has not changed by getting sick. 28% believed the disease encouraged them to vaccinate, and 8% reported that recovering from COVID-19 discouraged them from taking jabs.

**Conclusions:** The results of the study show that overcoming COVID-19 is associated with a greater risk of depression in chronic hemodialysis patients. It can be concluded that hemodialysis patients have generally a negative attitude to vaccination against common diseases, and only a little over ¼ of those who recovered from Covid-19 changed their attitude to favor vaccinations.

**"Let me present you - my disgust!" - declared disgust sensitivity  
in the presence of attractive models**

Michał Stefańczyk

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**Presenting author:** Michał Stefańczyk

**Introduction:** Disgust operates in three domains – pathogen, sexual and moral. Men and women differ in disgust sensitivity, with men scoring lower than women. However, the reasons for such large discrepancies remain unknown. Possibly, different disgust-related self-images are adaptive for men and women. Namely, men might prefer to present themselves as more insensitive to disgust than they really are, whereas women might want to exaggerate their disgust sensitivity.

**Aim of the study:** Exploration of the causes for the profound sex differences in disgust sensitivity.

**Materials and methods:** Participants (N = 299) filled the Three Domain Disgust Scale and rated 13 sensory disgust elicitors either out loud in the presence of an attractive female model, attractive male model, or in solitude.

**Results:** Men were less sensitive to disgust than women. The presence of an attractive models did not influence the overall sex differences in disgust sensitivity. In the presence of an attractive female model, both sexes declared heightened sexual disgust sensitivity.

**Conclusions:** Sex differences in disgust sensitivity cannot be explained by different self-presentation goals. However, both men and women declare heightened disgust sensitivity levels in the presence of an attractive female model, but not in the presence of an attractive male experimenter. This result is discussed in the perspective of social and evolutionary psychology.

## The impact of the Dark Triad on the compliance with pandemic restrictions

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Medical University of Silesia

**Presenting author:** Agnieszka Goryczka

**Tutors:** MD PhD Paweł Dębski, MD PhD Magdalena Piegza

**Introduction:** The outbreak of COVID-19 in January 2020 forced Polish authorities to introduce pandemic restrictions on an unprecedented scale (quarantine, social distancing, and isolation). The priority was the reduction of the spread of SARS-CoV-2 caused by people with symptoms of COVID-19, as well as by asymptomatic or presymptomatic individuals. Nevertheless, many Polish citizens have opposed or disobeyed pandemic restrictions. That group tried to solve the growing conflict between civil liberties and new pandemic rules imposed by EU-governments by rebelling against the latter. The intensity of the Dark Triad traits – narcissism, psychopathy and Machiavellianism – are the complex of variables which impact the probability of rebelling against the pandemic restrictions. The compliance of individuals with COVID-19 rules is crucial to control the course of the coronavirus pandemic. Therefore, exploring and understanding the impact of individual characteristics is a matter of great importance.

**Aim of the study:** The aim of the study was to investigate possible differences in the Dark Personality traits between groups that meet and do not meet the pandemic restrictions.

**Materials and methods:** A total of 604 adult Polish participants completed an online survey, which was shared on social media networks. The participants were divided into two groups, taking into account the declared compliance with pandemic recommendations. The Dark Triad traits were measured with a validated Polish version of the original 12-item Dark Triad Personality Test – “The Dirty Dozen”.

**Results:** Statistical analysis showed that individuals with disobedience towards pandemic restrictions were higher on one of the Dark Triad traits – psychopathy. On the other hand, participants who scored higher in narcissism were more likely to obey the rules of social distancing and quarantine. Machiavellianism didn't seem to distinguish significantly examined groups.

**Conclusions:** The analysis of the intensity of Dark Triad traits and their relationships with civil compliance during the COVID-19 pandemic can lead to better understanding of the differences in individual behaviour which seems to be a crucial factor in controlling the course of the coronavirus pandemic. The impact of Dark Personality is diverse. Individuals who score higher in psychopathy could be less likely to obey newly introduced restrictions. Conversely, subclinical narcissism is a variable that may be connected with a civil compliance.

## **Factors associated with anxiety and depressive symptoms among students during the COVID-19 pandemic – a survey study**

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**Presenting author:** Sara Brońska

**Tutor:** MD Michał Pers

**Introduction:** The emergence of the novel coronavirus markedly changed the functioning of societies, raising questions about the impact of the situation on the mental health of individuals from various populations. Certain variables, such as female gender and relatives with COVID-19, have already been described as associated with low psychological well-being during the pandemic.

**Aim of the study:** We aimed to evaluate the level of anxiety and depressive symptoms among students of academies in Kraków, Poland and to identify the factors that may influence their mental state.

**Material and methods:** An anonymous survey was distributed through Facebook in December 2020. It comprised several parts, including anxiety and depression screeners (GAD-7 and PHQ-8). The respondents' anxiety and depression scores were counted and coded as either „below 10” or „10 and greater” (the latter suggests the need for action such as further evaluation or counselling). Binomial logistic regression was performed in IBM SPSS Statistics 27. Some answers were excluded from the model due to incompleteness.

**Results:** 897 participants filled in the form, 800 were included in final calculations. Among them, most were female (66,3%) and aged 21-25 (50,8%). The aforementioned cutoff point was reached or surpassed by 36,4% of students for anxiety and 47,4% for depression. Regarding anxiety, a significant correlation with a GAD-7 score of  $\geq 10$  was found for female gender (AOR= 1,53, 95% CI 1,08-2,17) and gender declared as other (AOR=7,11, 95% CI 1,31-38,63) as compared to male, a history of mental disorder (AOR=2,74, 95% CI 1,80-4,18) and subjective perception of the negative impact of the social media on one's well-being during the pandemic (AOR=2,53, 95% CI 1,63-3,91) as compared to perceived positive impact. For the age of  $>25$  the AOR was 0,26 (95% CI 0,09-0,74, reference group-age  $\leq 20$ ). A significant correlation with a PHQ-8 depression score of  $\geq 10$  was found for gender declared as other (AOR=10,41, 95% CI 1,19-91,47), a history of mental disorder (AOR=2,80, 95% CI 1,81-4,34) and subjective perception of the negative impact of the social media on one's well-being (AOR=2,97, 95% CI 1,94-4,53).

**Conclusions:** The prevalence of anxiety and depressive symptoms among students is high and certain groups are more vulnerable to those issues than others. Our results suggest that appropriate measures should be taken to prevent the worsening of students' psychological well-being, especially in a time of a health crisis such as the ongoing pandemic."

## **Acceptance of the disease and quality of life in patients with type 1 and type 2 diabetes.**

Patryk Głowczyński, Katarzyna Sedlaczek

Medical University of Silesia

**Presenting author:** Patryk Głowczyński

**Tutors:** MD PhD Karina Badura-Brzoza

**Introduction:** Acceptance of the disease is one of the most important elements in the process of adaptation to life with a chronic illness.

**Aim of the study:** The aim of the study was to assess the relationship between disease acceptance and quality of life in patients with diabetes.

**Materials and methods:** The number of 101 patients with type 1 diabetes and 90 patients with type 2 diabetes were included in the study and examined by using of AIS, SF-36, SWLS and HADS scales.

**Results:** Statistically significant worse acceptance of the disease was found in patients with type 1 diabetes compared to patients with type 2 diabetes. Both groups did not differ in the assessment of quality of life. Patients with t1dm showed positive correlations of the level of disease acceptance with physical functioning and the psychological scale.

Among patients with t2dm, the age of the subjects and the duration of the disease correlated negatively with the acceptance of the disease and women showed better acceptance of the disease than men. Patients who accepted the disease more often presented lower severity of anxiety and depression symptoms as well as better metabolic control in both studied groups.

**Conclusion:** Patients diagnosed with type 1 diabetes showed worse acceptance of the disease compared to patients with type 2 diabetes. Acceptance of the disease affected the quality of life only in the group of patients diagnosed with type 1 diabetes. In both study groups, better disease acceptance correlated with lower anxiety and depression symptoms and better metabolic control.



**Assessment of knowledge and beliefs concerning mental disorders among medical students - preliminary report**

Patryk Głowczyński

Medical University of Silesia

**Presenting author:** Patryk Głowczyński

Tutors: MD PhD Karina Badura-Brzoza

**Aim of the study:** The aim of the study was to analyze the knowledge about mental disorders and attitudes towards mental diseases.

**Material and methods:** The survey was conducted in a group of 94 fifth-year students of medicine, including 59 women and 34 men, aged  $24.34 \pm 1.28$  years.

**Results:** In the conducted research, personal contact with a psychiatrist due to problems with their own mental health was declared by 23% of respondents. In the analysis of the questionnaire on beliefs, as many as 83% of respondents considered that mental illness is a cause for shame. At the same time, 81% of students would consult a psychiatrist if someone from their relatives suggested it, and 54% saw no problem in informing their friends about this fact. When asked about the use of electroconvulsive therapy, 95% of respondents answered that it is still a method used in specific indications in the field of mental illness. In the study group, 15% of people considered that psychotropic drugs were mainly used to control aggressive behavior, and 58% indicated that they are addictive.

**Conclusions.**

1. The image of a person with mental disorders, as assessed by medical students, does not differ from the stereotypical approach of the general public.
2. The results of the research suggest the necessity of promoting the knowledge and shaping the right attitudes among future doctors."

## Evaluation of the usefulness of NLR as a remission marker in patients with schizophrenia

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Adam Biłgorajski, Klaudia Kościelecka

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**Tutors:** Piotr Podwalski, Krzysztof Szczygieł

**Introduction:** Schizophrenia is a chronic mental illness characterized by the presence of positive and negative symptoms, which is based on dysfunction of the immune system. In schizophrenia, there is likely an overactivation of immune system associated with microglia activation, increased oxidative stress, and neuroinflammation that affect the function and vitality of neurons. Meta-analyses showed changes in the levels of cytokines in the blood and cerebrospinal fluid in patients with schizophrenia. Many cytokines are growth factors for different leukocyte fractions. NLR (neutrophil-to-lymphocyte ratio), is one of the indicators obtained on the basis of venous blood counts. Meta-analyses have shown that NLR is elevated in patients with schizophrenia. NLR is also largely independent of other commonly used inflammatory and metabolic markers, correlates with the severity of symptoms and decreases under the influence of neuroleptics, which makes it a promising tool for diagnosis and prediction of response to treatment in patients.

**Aim of the study:** To assess whether the NLR value at the beginning of hospitalization can be used to predict a change in NLR until the end of hospitalization, and thus to use NLR as a remission marker in schizophrenia, and to identify factors that may influence the change of NLR from the beginning to the end of hospitalization.

**Material and methods:** Data were collected from the medical history of patients from January 2015 to July 2020 hospitalized in the Department of Psychiatry of the Pomeranian Medical University. 300 files of patients diagnosed with schizophrenia were randomly selected, which were then included in the study and excluded from it based on the established criteria. The final research group included 40 patients ( $n_p = 40$ ) and 71 observations ( $n_o = 71$ ). In the statistical analysis using a linear mixed-effect model, NLR from the first blood count, gender, neuroleptic treatment on admission, smoking, hypertension, hypothyroidism, age, BMI, and duration of therapy were included as fixed effects for the change in NLR.

**Results:** Gender, treatment with neuroleptics on admission, smoking, hypertension, age, BMI, and treatment time did not improve the fit of the model. Significant fixed effects were age ( $\beta = 0.013$ ,  $p = 0.042$ ), NLR from the blood count ( $\beta = -0.644$ ,  $p < 0.001$ ), and hypothyroidism ( $\beta = 0.523$ ,  $p = 0.012$ ). The final model fit well with the data with a marginal pseudoR<sup>2</sup> = 0.634 and a corrected pseudoR<sup>2</sup> = 0.773.

**Conclusions:** Knowing the initial NLR, the final NLR can be determined, which may make it possible to use this ratio as a remission marker. The dynamics of changes seems to be lower in the population of patients with hypothyroidism, in this population the NLR often even increases during hospitalization. The change in NLR during hospitalization is less in older patients. The change in NLR during hospitalization is independent of BMI, smoking, neuroleptic treatment on admission, and duration of therapy."

## How doctors react to and cope with patient death: a survey of Lithuanian doctors

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**Tutors:** MD PhD Edgaras Dlugauskas

**Introduction:** Patient death (PD) is a stressful experience that most doctors encounter at some point in their careers. The emotional reactions and coping strategies meant to deal with PD may differ between doctors.

**Aim of the study:** We aimed to measure doctor's reaction to PD, determine the coping strategies used and measure possible traumatic stress symptoms, as well as find any connection with demographic factors that could influence them.

**Materials and methods:** A cross-sectional voluntary anonymous survey of Lithuanian medical doctors was performed online in February 2021. The survey included questions concerning demographic data, the Brief-COPE questionnaire, the Impact of Event Scale-6 (IES-6), and asked participants to measure their reaction to PD on a scale of 0 to 10. Statistical analysis was performed using IBM Statistics SPSS 27. A p-value less than 0,05 was considered to show statistical significance.

**Results:** The study included 136 participating doctors of various specialties. 118 (86,8%) were female and 17 male (12,5%), 41,5±10,4 years old on average. 66,2% of respondents encounter PD monthly or weekly. On a 10-point scale measuring the impact of PD the mean value was 6,07±2,5 points. Women reported a significantly stronger emotional impact than men ( $U=653$ ,  $p=0,019$ ) and had higher scores of IES-6 Hyperarousal subscale ( $U=636,5$ ,  $p=0,014$ ), no other differences between genders were found. IES-6 Intrusion, Hyperarousal and Avoidance subscale means were 1,61±1,15; 1,41±1,03; and 1,24±0,94, respectively, with a total score of 1,42±0,95 on average. The Brief-COPE questionnaire's mean Approach score was 29,3±6,0 and mean Avoidant score was 21,1±4,3. The 10-point impact scale had a strong positive correlation with IES-6 subscales and moderate to weak correlations with most of Brief-COPE subscale and total scores. The frequency with which respondents encounter PD correlated weakly negatively with IES-6 Intrusion, Hyperarousal, and total scores, as well as the 10-point impact scale ( $\rho=-0,287$ ;  $-0,208$ ;  $-0,236$ ;  $-0,314$ ). All IES-6 scores correlated more strongly with Brief-COPE Avoidant Coping than Approach Coping scores.

**Conclusions:** The study shows that experiencing PD is frequent in a Lithuanian doctor's career with most respondents claiming it happens weekly or monthly. This has a moderate to strong emotional impact with women being affected more strongly. We see that Lithuanian doctors more often employ coping strategies belonging to Approach Coping, which are considered more helpful, adaptive and produce better mental health outcomes as opposed to Avoidant Coping, which is less effective at managing stressful events and anxiety. Respondents who were more emotionally affected also had stronger stress symptoms and employed more Avoidant Coping strategies. Experiencing PD more frequently leads to less emotional impact and a reduction in stress symptoms. Finally, having stronger stress symptoms is connected to choosing less healthy coping strategies.

## **The use of computer programs in training cognitive functions in the elderly**

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**Introduction:** The aging of the organism is a physiological, natural process. In the elderly, cognitive functions may deteriorate with age. This may be manifested by: memory, attention, thinking and perception disorders. Problems with cognitive functioning translate into everyday functioning. It often happens that patients themselves notice these problems. They then begin to look for the source of the problem and, over time, also for a way to improve cognitive functioning. The use of modern methods in training cognitive functions is becoming more and more common not only in Western Europe, but also in Poland.

**Aim of the study:** The aim of the study was to determine the impact of memory training with the use of a specialized computer game on cognitive functions in people over 60 years of age.

**Material and methods:** 20 patients aged over 60 participated in the study. Cognitive functioning was assessed using the following tests: Addenbrooke's Cognitive Examination (ACE III) and Mini-Mental State Examination (MMSE). Patients participated in cognitive training sessions twice a week for three months. Each training session lasted 60 minutes. Tests assessing cognitive functioning were carried out twice: before and after training.

**Results:** Average results in the ACE III test were: before training: 92.35 points and after training: 96.8 (in the test, you can get a maximum of 100 points from all subtests). The average results in the MMSE test were: before training: 27.7 points and after training: 28.85 (in the test you can get a maximum of 30 points). The statistical significance of the results was respectively:  $p = 0.000038$  for ACE III and  $p = 0.0096$  for MMSE.

**Conclusions:** The results of the research showed that the intervention with the use of a specialized computer game brought the expected results. Patients achieved better results in post-training cognitive function tests compared to pre-training test results. The results are visible not only in the tests (which is confirmed by the statistical results), but most of all the patients experienced an improvement in their daily functioning.

## **Reduction of depressive symptoms and inflammatory markers in blood among patients with rheumatic disease treated with biological therapy: a cross sectional study**

Gabrielius Zdanys, Juta Zinkevičiūtė

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**Tutors:** MD PhD Edgaras Dlugauskas, MD PhD Dalia Miltinienė, Robertas Strumila

**Introduction:** Previous studies suggest that one of the possible depression pathophysiological pathways is autoimmune inflammation increasing inflammatory mediators' levels and thus affecting mood. The significant evidence of the links between depression and inflammation was provided by investigating animal models as well as patients with such diseases as inflammatory bowel diseases, rheumatic diseases, cancer, cardiovascular diseases or diabetes mellitus. This study was conducted in the University Hospital Santaros Clinics, Centre of Rheumatology.

**Aim of the study:** To compare depression symptoms and inflammatory markers in blood (C-reactive protein, white blood cells and erythrocyte sedimentation rate) among rheumatic disease (rheumatoid arthritis, psoriatic arthritis or ankylosing spondylitis) patients receiving TNF- $\alpha$  inhibitors or IL-6 inhibitors and those receiving treatment as usual (TAU).

**Material and methods:** Instruments: Visual analog scale (VAS), Hospital anxiety and depression scale (HADS), Patient's Health Questionnaire (PHQ-9) and inflammatory markers in blood. Active rheumatic disease patients not using antidepressants in the age range from 18 to 65 years were included in the study and divided into an experimental group (receiving biological therapy) and control group (receiving TAU). Data were analyzed with SPSS 23.0

**Results:** 44 patients' data were analyzed. Between the experimental group and the control group, the VAS score was not significantly different (the experimental group  $55,59 \pm 4,90$  and the control group  $67,86 \pm 3,57$ ,  $p > 0.05$ ). The mean total score of the HAD scale and PHQ-9 were significantly different between both groups (HAD: experimental group  $7,27 \pm 1,03$ , control group  $15,23 \pm 1,61$ ;  $p < 0.05$ , PHQ-9: experimental group  $5,32 \pm 1,16$ , control group  $11,86 \pm 1,06$ ;  $p < 0.05$ ). The mean values of WBC, ESG and CRP were significantly different between both groups (WBC: experimental group  $6,79 \pm 0,31$ , control group  $7,28 \pm 0,57$ ;  $p < 0.05$ ; ESG: experimental group  $20,09 \pm 2,10$ , control group  $33,90 \pm 4,70$ ;  $p < 0.05$ ; CRP: experimental group  $7,58 \pm 3,10$ ; control group  $27,00 \pm 8,39$ ;  $p < 0.05$ ).

**Conclusions:** Patients treated with biological therapy experienced fewer depression symptoms and had lower inflammatory markers values in blood than patients showing similar disease activity but receiving TAU.

## Psychoemotional aspects of adolescent eating disorders

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Riga Stradins University.

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**Tutors:** MD PhD Lelde Logina

**Introduction.** Adolescents are at higher risk for eating disorders compared to the general population. Few research papers review the link between the eating disorder and the psychological factors in the adolescents population. And there are no studies that investigate the problem for the Latvian population.

**Aim of the study.** This study aims to measure the causation between eating disorder among Latvian adolescents and their perfectionism, self-esteem, and body image flexibility.

**Materials and methods.** We asked multiple schools to give adolescents to fill a questionnaire electronically, voluntarily. We received 165 valid responses from the respondents in age 14 to 19, from whom 132 were females and 33 males. The questionnaire consists of demographic data, SCOFF questionnaire, Eating Disorder Examination-Questionnaire (EDE-Q), Rosenberg Self-Esteem Scale (RSES), Almost Perfect Scale-Revised (APS-R) and Body image-acceptance and action questionnaire (BI-AAQ). The main statistical methods we used were ANOVA, Kruskal-Wallis test, Wilcoxon test and generalized adaptive model.

**Results.** We find statistically significant results between the eating disorder and each psychological factor ( $p < 0.0001$  in each case). There is a strong correlation between adolescents body image inflexibility and the eating disorder examination score ( $r = 0.90$ ). There exists a positive link between maladaptive perfectionism and the eating disorder examination and a negative effect between adaptive perfectionism and the eating disorder. There is a negative relation between adolescents self-esteem and their eating disorder examination results.

**Conclusion.** Results of this study showed that there is a link between disordered eating and perfectionism, low self-esteem and body image inflexibility.

## **Fear of COVID-19 among medical students and associated factors**

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**Aim of the study:** To determine the level of COVID-19 fear among Turkish medical students, and show the relationship the types of education (online, hybrid, face to face), age, gender, grade, and level of fear.

**Methods:** The study was conducted with 536 medical students from 30 different universities in Turkey. The questionnaire comprised 1 open-ended and 6 multiple choice questions for assessment of the demographic structure, in addition to 7 Likert-type questions within the 'Fear of COVID-19 Scale'.

**Results:** Participants comprised 352 (65.7%) female and 184 (34.3%) male students, with a mean age of  $20.04 \pm 2.59$  years and they showed significantly different Fear of COVID-19 Scale scores with regard to gender. The past or current presence of COVID-19 was determined as another variable that created a significant difference in the Fear of COVID-19 Scale scores. However, no relation between the past or current presence of COVID-19 in a family member and the Fear of COVID-19 Scale scores were found.

**Conclusion:** In this study, it is demonstrated that fear of COVID-19 is higher among females and non-infected medical students compared to males and infected ones, respectively. These results can be used in assessing the fear level of COVID-19 among medical students concerning their gender and infection history. **Keywords:** COVID-19, medical students, fear, distance education, medical education

**The anxiety and depressive symptoms among rheumatic disease patients receiving different treatment and the link between anxiety/depressive symptoms and inflammatory markers in blood.**

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**Introduction:** Over the past two decades, the research of the association between inflammation and mood changes has progressed rapidly. Various findings provide the evidence that inflammatory and depressive/anxious states share similar pathophysiological pathways. Some studies suggest that biological therapy targeting inflammatory markers reduces symptoms of anxiety and depression. This study contributes to the previous evidence of the links between depression and inflammation and was conducted in the University Hospital Santaros Clinics, Centre of Rheumatology.

**Aim of the study:** To compare anxiety and depressive symptoms among rheumatic disease (rheumatoid arthritis, psoriatic arthritis or ankylosing spondylitis) patients receiving TNF- $\alpha$  inhibitors or IL-6 inhibitors and those receiving treatment as usual (TAU). To evaluate the relation between anxiety/depression symptoms and inflammatory markers (white blood cells count, erythrocyte sedimentation rate and C-reactive protein) value.

**Material and methods:** Instruments: Visual analog scale (VAS), Hospital anxiety and depression scale (HADS) and inflammatory markers in blood. Active rheumatoid arthritis, psoriatic arthritis and ankylosing spondylitis patients not using antidepressants in the age range from 18 to 65 years were included in the study and divided into an experimental group (receiving biological therapy) and control group (receiving TAU). Data were analyzed with SPSS 23.0

**Results:** 44 patients' data were analyzed. Between the experimental group and the control group, the VAS score was not significantly different (the experimental group  $55,59 \pm 4,90$  and the control group  $67,86 \pm 3,57$ ,  $p=0,7$ ,  $p > 0.05$ ). The mean total score of the HAD scale were significantly different between both groups (experimental group  $7,27 \pm 1,03$ ; control group  $15,23 \pm 1,61$ ,  $p < 0.05$ ). The mean anxiety subscale score was not significantly different between both groups (the experimental group  $5,04 \pm 0,80$ ;  $10,23 \pm 1,1$ ,  $p > 0,05$ ), while the mean depressive subscale score was significantly higher in the control group ( $3,86 \pm 0,61$ ,  $p = 0,36$ ). The activity of anxiety symptoms did not correlate with the value of WBC (Pearson's  $R=0,104$ ,  $p > 0,05$ ), ESG (Spearman Correlation= $0,007$ ,  $p > 0,05$ ) and CRP (Spearman Correlation= $0,223$ ,  $p > 0,05$ ). While the activity of depressive symptoms did not depend on the value of WBC (Spearman Correlation= $0,59$ ,  $p > 0,05$ ) and ESG (Spearman Correlation= $0,189$ ,  $p > 0,05$ ), but correlated with the value of CRP (Spearman Correlation= $0,312$ ,  $p < 0,05$ ).

**Conclusions:** Patients treated with biological therapy experienced fewer depressive symptoms than patients showing similar disease activity but receiving TAU but demonstrated the same activity of the anxiety symptoms. The higher depressive symptoms were linked with the higher values of CRP.



## **Strategies for dealing with stress, resilience and job satisfaction with professional nurses during the COVID-19 pandemic as a traumatic event**

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**Introduction:** During the COVID-19 pandemic, nurses are the most vulnerable group at risk of developing SARS-CoV-2 and a high mental burden. The COVID-19 pandemic is often called a traumatic event. The mental health of nurses is exposed to various stressors related to the protection and saving of patients' lives.

**Aim of the study:** The aim of the study was to collect information about the psychological and organizational situation of nurses during the COVID-19 pandemic.

**Materials and methods:** 81 active nurses (79 women and 2 men) took part in the study. The average age of the respondents was 42 years. The survey was conducted online using a survey questionnaire. The following tools were used in the questionnaire: Job satisfaction - to assess job satisfaction.

### **Results:**

Correlation between the general PTSD index (IES-R scale - Event Impact Scale) and the question "In your opinion, is the medical entity in which you provide services well organized in connection with the pandemic?", i.e. the organization of the medical entity, in to the conditions imposed by the pandemic ( $p = 0.022$ ). Statistically significant was the correlation between the PTSD index and the question "On a scale of 1 to 10, how much are you afraid of coronavirus infection at work?" ( $p = 0.028$ ). The Resilience Resilience Scale (KSPZ) correlates with the Job Satisfaction Scale at the level of  $p = 0$ . There was also a correlation between the Resilience Scale and the MiniCope Scale, and more specifically between the following coping strategies: 1. Active coping ( $p = 0$ ); 2. Planning ( $p = 0.02$ ); 3. Positive reevaluation ( $p = 0.004$ ); 4. Acceptance ( $p = 0$ ); 5. Sense of humor ( $p = 0.016$ ); 6. Turn to religion ( $p = 0.013$ ); 7. Discharge ( $p = 0.038$ ).

### **Conclusions:**

It is especially important that there is no chaos in the subject, because it is a factor that protects against PTSD. It is worth building programs that strengthen coping resilience because they are significantly correlated with adaptive strategies of coping with stress. Risk and protection factors should be monitored in terms of building a mental health prevention system for nurses and other medical workers.

## Studying medicine in Poland- who is more resistant to stress: male or female students?

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**Introduction:** Stress is a natural feeling we experience every day- it's our body's reaction to stimuli known as stressors. It is widely said that stress may have a positive impact on our bodies to some extent (eustress) but at some point, it may be harmful and leads to psychological problems (distress). Differentiation between eustress and distress is vital if we want to lead a healthy lifestyle.

**Aim of the study:** The study aimed to evaluate the stress level among the group of female and male medical students and to see which of them is more prone to stress.

We also wanted to see whether or not do they know how to deal with the stressors.

**Materials and methods:** We enrolled 1321 medical students from all six years of Jagiellonian University Medical College in Kraków including 768 female and 553 male respondents. The overall response rate was 94%. To assess the level of stress we used two independent stress questionnaires validated for the polish translation and environment: PMSS (Perceived Medical School Stress Instrument) and PSS-10 (Perceived Stress Scale).

These two cover a wide range of stressors including competition, social isolation, workload etc.

**Results:** Male and female medical students differed significantly in total PSS-10 scores. The mean level of stress among female students was high at  $22.47 \pm 6.81$ . The median for female students was 23 and the quartiles ranged from 18 to 27. The mean level of stress among male students was moderate at  $19.32 \pm 7.33$ . The median for male students was 20 and the quartiles ranged from 15 to 25. The variation between female and male students was 3.15. The stress level was statistically significantly higher in female medical students.

Both groups did not significantly differ in the rates of stress score in the PMSS questionnaire.

**Conclusions:** During our study, we found out that the level of stress among the group of polish medical students is high. If we compare the results of our research with the studies conducted at foreign universities (German, American or Norwegian) we can easily find out that polish medical undergraduates are more stressed than their foreign colleagues.

High-stress scores are likely to cause psychological problems and poor academic performance, therefore we think that support services should be made widely available to all medical students. We believe that such solutions would help students to cope with stress and thus, would help them to achieve more goals during their study period.

## Strategies to overcome anxiety and depression during the quarantine

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**Tutors:** MD PhD Rima Viliūnienė

**Introduction.** COVID-19 infection is responsible for the quarantine which affected people's mental health by causing anxiety and depression symptoms. In order to feel better people search for a new effective ways to fight these emerging symptoms.

**Aim of the study.** To discover which strategies to overcome anxiety and depression were the most effective during the first and the second quarantine.

**Method.** In January-March of 2021 an online anonymous questionnaire survey was conducted. During it, 141 students and medical residents were interviewed. The relevant information of participants was collected by a self-designed questionnaire. The anxiety and depression symptoms were evaluated through the Hospital Anxiety and Depression Scale (HADS).

**Results.** The most common challenges to mental health during the first quarantine were anxiety (70.2%), uncertainty (60.3%) and boredom (54.6%). 45.4% of respondents identified new problems during the second quarantine that changed their mental health status: sadness (50.7%) and loneliness (45.1%). The study showed that 68.8% of respondents had anxiety and 31.9% had depression. There was found a correlation between respondent's subjective method's effectiveness evaluation and frequency of usage. The more the method was evaluated as effective, the more frequently it was used. The most effective ones were communicating with relatives or friends online or by the phone ( $p=0.0001$ ); positive thinking strategies ( $p<0.05$ ); voluntary quarantine when we sacrifice for the preservation of other people's health ( $p<0.05$ ); sports in nature or at home ( $p<0.05$ ); routine development and adherence ( $p<0.05$ ). In addition, things that helped to feel better were dedication to work, profession ( $p<0.05$ ); devotion to activities, hobbies ( $p<0.05$ ); careful preparation for the crisis ( $p<0.05$ ); following government recommendations ( $p=0.0005$ ); watching TV or movies ( $p<0.05$ ); social networks ( $p=0.0001$ ). The least number of respondents consulted a psychologist (12.7%) and a psychiatrist (4.2%). The same trends were observed during the second quarantine. All the methods and subjects listed above have a significant value of  $p<0.05$ .

**Conclusions.** During both quarantines, the most effective strategies to overcome anxiety and depression were communication with relatives or friends online or by phone; positive thinking strategies; voluntary quarantine; sports in nature or at home; creating and following a routine; dedication to work, profession; devotion to hobbies; preparation for the crisis; following government recommendations; watching television or movies; social networks.

## **Impact of daily life changes and mental health challenges on the onset of depression and anxiety symptoms during quarantine**

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**Introduction.** COVID-19 infection associated quarantine changed people's daily lives and caused new mental health challenges which could be responsible for the onset of new depression and anxiety symptoms.

**Aim of the study.** To determine which changes in daily life and new mental health challenges had the biggest impact on the manifestation of anxiety and depressive symptoms during quarantine.

**Method.** January-March 2021 an anonymous online survey was carried out. The study interviewed 141 students and a medical resident. The questionnaire consisted of 38 questions. The anxiety and depression symptoms were evaluated through the Hospital Anxiety and Depression Scale (HADS).

**Results.** 68.8% of respondents had anxiety and 31.9% of depression. Most of them spent the first quarantine at home with their parents (58.9 %), during the second quarantine the tendency remained the same (48.2 %). The study found a correlation between certain changes in daily life and the manifestation of anxiety or depression: increased food intake and increased anxiety ( $p=0.038$ ) and depression ( $p=0.00038$ ); increased internet time and increased anxiety ( $p=0.009$ ) and depression ( $p=0.0002$ ); prolonged sleep time and more expressed depression ( $p=0.001$ ); decreased communication with friends, peers and increased anxiety ( $p=0.001$ ) and depression ( $p=0.00007$ ); reduced sports time and more expressed depression ( $p=0.03$ ). The most common challenges affecting mental health during the first quarantine were anxiety (70.2 %), uncertainty (60.3 %) and boredom (54.6 %), while during the second quarantine 45.4 % of respondents identified new problems that contributed: sadness (50.7 %) and loneliness (45.1 %). Mental health challenges such as anxiety, fear, sadness, disagreements with loved ones and uncertainty (all  $p<0.05$ ) were correlated with a stronger manifestation of anxiety. Fear, sadness, disagreements with loved ones correlated with a stronger manifestation of depression (all  $p<0.05$ ). It was also observed that the more challenges the respondents faced, the stronger were the symptoms of anxiety ( $p=0.00008$ ) and depression ( $p=0.0004$ ).

**Conclusions.** Daily life changes such as increased food intake, increased time spent online, decreased communication with friends, peers were significantly associated with increased expression of anxiety and depression symptoms. Decreased exercise time, prolonged sleep was associated only with depression. All above mentioned daily life changes can be interpreted as early signs of anxiety and depression. Mental health challenges such as fear, sadness, disagreements with loved ones were significantly associated with the anxiety and depression symptoms. Uncertainty and anxiety were related to only the anxiety.

## Reasons not to reach help from emotional helplines among patients hospitalized in mental healthcare institutions

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**Tutors:** Prof. Alvydas Navickas

**Aim of the Study:** To investigate whether patients treated in mental health care facilities have heard about the possibility of contacting emotional support lines and whether they know the principles of the lines. Evaluate the reasons for not applying to the emotional support lines and examine the opinion of the applicants about the quality of this type of support.

**Methods:** An anonymous questionnaire survey was conducted. The survey included 45 patients: 26 were treated in VmPSC (Vilnius City Mental Health Centre) I acute, 11 in the borderline conditions ward, and 8 in the RPLC (Republican Centre for Addictive Disorders) motivational therapy and rehabilitation ward. The questionnaire consisted of questions covering demographic data, questions about suicide, crises experienced, knowledge about the activities of emotional support lines, reasons for not contacting emotional support lines, and assessment of the quality of helpline services.

**Results:** 24 (53%) men and 21 (47%) women were interviewed, with a mean age of  $43 \pm 16.29$ . 36 (80%) patients reported having heard of emotional helplines, but only 5 (14%) patients have applied. 38 (84%) patients said they knew which phone number to call an ambulance for. The "Youth Line" is an emotional helpline that most of the interviewed patients know about - 17 (38%). Loss of relatives and divorce, the most common crises experienced by the interviewed patients, were reported by 16 (36%) and 13 (29%) patients, respectively. 21 (47%) patients indicated that they consult a specialist (psychologist, psychotherapist, psychiatrist) in the event of a crisis, 13 (29%) - with a family, 3 (7%) patients indicated that they turn to emotional helplines. The majority of patients indicated that they did not turn to emotional helplines because they did not remember the possibility of such help.

**Conclusions:** 80% of patients have heard of emotional helplines, but only 14% of them have sought such help.

## **Impact of adverse childhood experiences on relationships and depression among medical and dental students.**

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**Presenting author:** Agata Bura

**Tutors:** MD PhD Grzegorz Mizerski

**Introduction:** Adverse childhood experiences (ACEs) are stressful and traumatic situations, such as physical and emotional abuse or neglect which concern children under 18 years of age. ACEs are established to have a link with multiple health problems in adult life, such as an increased risk of somatic diseases (ischemic heart disease, COPD, asthma, allergies, rheumatoid arthritis) and psychiatric disorders (depression, eating disorders, drug abuse, suicide attempts). Exposure to 4 or more ACEs is established as a strong predictor of poor health.

**Aim of the study:** The aim of the study was to investigate the occurrence of adverse childhood experiences and factors associated with them among medical and dental students from Poland.

**Material and methods:** This cross-sectional study was conducted among 934 medical and 228 dental students (a total of 1162 participants) from 18 Polish universities. The survey included Adverse Childhood Experiences questionnaire and author's questions to collect information about sociodemographic characteristics and investigated factors. The answers were collected in the April of 2020.

**Results:** 57.4% of the participants had at least 1 exposure to ACEs, 8.43% had 4 or more ACEs. The most commonly reported adversities were emotional neglect (23.06%), emotional abuse (22.98%) and mental illness in a household member (21.86%). Higher percentage of women than men reported emotional abuse (OR=1.37, 95% CI=0.98–1.93, p=0.03), sexual abuse (OR=4.28, 95% CI=1.31-13.95, p=0.008) and emotional neglect (OR=1.51, 95% CI=1.07-2.13, p=0.009). In case of emotional neglect, a relationship was found between this adversity and female gender. A graded relationship was found between ACE score and: parents' primary, lower secondary or basic vocational level of education; bad relationship with parents, siblings and friends; a feeling of not having a person that one could count on in a difficult situation; presence of subjective feeling of depressive symptoms and having a diagnosis of depression.

**Conclusions:** Multiple medical and dental students have experienced childhood adversities. There is a huge need of raising awareness of adverse childhood experiences and their influence on life quality, as well as an education on coping strategies for them among medical and dental students.

## **Prevalence of suicidal thoughts and behaviour in the student population of Latvia during the COVID-19 outbreak**

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**Introduction.** According to WHO data from 2018, average suicide rate in Europe was 15,4 (per 100 000 population) while in Latvia 21,2 (per 100 000 population). During the current crisis stress, fear about the future, financial instability, anxiety, and isolation has led to different behavioural consequences including suicidal behaviours. Few studies have been conducted to show the prevalence of suicidal thoughts in the student population.

**Aim of the study.** To identify prevalence of suicidal thoughts and behaviour among student population during the COVID-19 outbreak and explore the potential influential factors.

**Material and methods.** In this cross-sectional study, university and college students were asked to fill the self-report questionnaire electronically on voluntary basis. Risk Assessment Suicidality Scale was used to measure risk of suicidal behaviours, intention, life, and history of suicide attempts. Scale was modified according to the state of an emergency period. Study is based on a questionnaire developed as part of an international study of the collaboration of the Aristotle University of Thessaloniki, Greece with the World Psychiatric Association. Data were analysed using Microsoft Excel 2018, SPSS Statistics.

**Results.** In total 1092 students filled the questionnaire; 79,6% (n=869) of the respondents were women, 19,8% (n=216) were men, 0,6% (n=7) of the respondents did not want to indicate their gender. The results show that 18,9% (n=206) of the students' tendency to think about death and/or suicide increased compared to before the outbreak of COVID-19. Data reveal that 8,2% (n=89) of respondents have attempted a suicide one or more times in their lifetime. Data indicate that 59,6% (n=651) of respondents some or more times have thought that it would be better if they were dead. Numbers show that 18,1% (n=197) of students had thoughts of attempting a suicide during the state of an emergency it they have had a chance, 23,8% (n=260) of respondents have had thoughts of causing physical harm to themselves.

**Conclusions.** The present findings confirm that there is an increment for students to think of death and suicide during state of an emergency. Several students had attempted suicide before the state of an emergency, leading to the conclusion that restrictions and isolation may lead to repeated suicide attempts in these students. Future research on suicidal thoughts among students might extend the explanations of risk factors and recommendations for suicide prevention.

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## **Adverse Childhood Experiences as a significant predictor of depression among Polish medical and dental students**

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**Presenting author:** Paulina Drożak

**Tutors:** MD PhD Grzegorz Mizerski

**Introduction:** Effects of exposure to adverse childhood experiences (ACEs) are a major public health problem. There is a well-documented evidence for the impact of ACEs on mental health outcomes in adult life such as elevated risk of depression or attempting suicide. Furthermore, multiple studies have shown that depression rates among medical and dental students are higher than in general population.

**Aim of the study:** The aim of this study was to investigate the prevalence of adverse childhood experiences and depression and to examine a relationship between them among Polish medical and dental students.

**Material and methods:** This cross-sectional study was conducted among 934 medical and 228 dental students (a total of 1162 participants) from 18 Polish universities. The survey included Adverse Childhood Experiences questionnaire and a 9-Item-Patient Health Questionnaire (PHQ-9) to assess depression. The answers were collected in the April of 2020.

**Results:** More than half of the participants (57.4%, 95% CI: 54.50–60.27) had at least 1 exposure to ACEs, about 1 in 12 (8.43%, 95% CI: 6.90–10.18) had 4 or more ACEs. The most commonly reported adversities were emotional neglect (23.06%), emotional abuse (22.98%) and mental illness in a household member (21.86%). About a half of the participants (52.15%, 95% CI: 49.23-55.06) were found to have major depression (PHQ Score  $\geq$  10). Overall 30.81%, 26.76% and 15.49% of the respondents were classified as having mild, moderate and moderately severe depressive symptoms respectively. 1 in 10 of the participants (9.90%) had symptoms of severe depression. ACE score showed a graded relationship to the presence of major depression. Among respondents who met the criteria for major depression, ACEs showed a highly statistically significant dose-response relationship with severity of depressive symptoms.

**Conclusions:** Adverse childhood experiences and depression are common among Polish medical and dental students. There is a significant relationship between exposure to ACEs and depression in later life as a student. The study emphasizes the importance of raising awareness of both childhood adversities and depression in order to prevent them and help those affected.

## **Assessment of Awareness and Patterns of Deprescription amongst Doctors in Tertiary Healthcare Centres in India.**

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**Presenting author:** Japmehar Sandhu

**Tutors:** MD Inderpal Kaur

**Introduction:** Rational drug therapy is a supremely effective way to provide primary care. This includes measures such as deprescribing: the systematic review and reduction of dose or complete cessation of drugs intended for chronic use following a risk-benefit analysis whilst remaining in congruence with the patient's welfare, quality of life, values, behavioural, social and economic circumstances.

**Aim of the study:** This study aims to shine light on the prevalence of deprescribing amongst Indian doctors, in spite of insufficient mapping of prescribing patterns. The study answers how doctors acquire knowledge regarding deprescription, their attitudes towards the same and the factors influencing their deprescribing habits. The reluctance felt by doctors in deprescribing drugs prescribed by other doctors is also assessed.

**Materials and methods:** A validated qualitative survey in the form of an objective questionnaire shared with doctors working in various departments of medicine, psychiatry, and orthopaedics witnessing chronically prescribed drugs. Data collected is assessed by creation of bar graphs.

**Results:** Out of the surveyed doctors, 35% were senior residents while the remaining were their juniors. Most of the doctors agreed that deprescribing was beneficial in the current clinical scenario whilst 25% expressed a neutral stance in the same. The popular (50%) opinion was to practice the habit in all age groups while others (45%) elected to majorly focus on the geriatric age group. Steroids, Benzodiazepines, antibiotics and Proton pump inhibitors were the most preferred drugs for deprescription and the prevalent reason cited was to protect the patient from adverse drug reactions. 65% doctors did not use any specific criteria for deprescription however 90% of them expressed being amenable to following set guidelines on the same. The biggest barrier to deprescribing was reported to be the current doctor being unsure of the rationale behind previously prescribed medications by other doctors. Lack of experience(25%) and resistance from the patient(30%) was also outlined. A resounding 75% agreed that advanced age and comorbidities affecting drug metabolism made the physician more likely to deprescribe. Interestingly, 55% of the doctors were previously unaware of the term 'deprescribing' and a 100% of the surveyed physicians believed there existed a lack of awareness on the topic in the medical community. All of the doctors part of the study responded positively when asked if they would incorporate the concept in their curriculum, were they teaching at a medical institute.

**Conclusion:** It is the first time that the prevalence of deprescription was assessed at a government tertiary healthcare centre. This study concludes that there exists a lack of awareness of the concept stemming from a lack of representation in the degree curriculum and absence of department set criteria for deprescribing. The biggest hurdle was identified as a lack of information on the rationale behind previously prescribed medicines.

## Awareness of Myopia Risk Factors and Prevention: A Survey Among High School Students

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Tutor: MD PhD Eglė Danielienė

**Introduction:** It is expected that by 2050, the number of short-sighted people will reach 4800 million worldwide and in that case every second person will have myopia. Myopia usually develops in early childhood or adolescence and its rapid increase is mostly conditioned by ascending influence of environmental and behavioural factors.

**Aim of the study:** The aim of this study was to collect data on the level of awareness of myopia risk factors and preventative agents amongst high schoolers in Lithuania.

**Methods:** A cross-sectional survey was conducted among 432 participants, aged 16-20 years. The online questionnaire consisted of 19 questions about major risk factors (screen time, eye-to-screen distance, time spent outdoors) and preventive measures.

**Results:** 216 (50%) of the survey respondents were myopic. Participants chose heredity (92% 399/432), screen-time (89,1%, 385/432), poor lighting (75,9% 328/432) as major risk factors for myopia. 88,1% (381/432) of Lithuanian students agreed that screen-time must be limited and 66,9% (289/432) thought that it should be 3 hours or less per day. 85,7% (370/432) were convinced that online-learning due to COVID-19 increases the risk and severity of myopia. However, even 26,4% (114/432) reported that an eye-to-screen distance of less than 30 cm was acceptable. Questions about screen-time and eye-to-screen distance were compared between myopic and non-myopic respondents and surprisingly, no significant differences were observed between two groups ( $p= 0.838$ ,  $p= 0.076$  respectively). Respondents were aware of the importance of regular breaks during screen-time (88,6%, 383/432), adequate lighting (77,5%, 335/432), switching small screens to larger ones (291/342 67,4%), regular eye-checks (65,9%, 285/432), outdoor activity (268/432 62%) and adequate sleep (233/432, 53,9%) as actions against the progression of myopia. However, 20.6% (89/432) chose that time spent outdoors per week should be only 2 to 5 hours and 13,7% (59/432) have never visited an ophthalmologist.

**Conclusion:** Despite a satisfactory level of awareness of myopia risk factors, that was demonstrated by the respondents, awareness campaigns may be useful for further promotion of preventive measures. Two factors eye-to-screen distance and outdoor activity hours require special attention.

## **Comparison of the post-vaccination reaction between respondents with positive RT-PCR results for SARS-CoV-2 and those with negative RT-PCR after first and second doses of the vaccine.**

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Tutors: PhD Beata Zarzycka

**Introduction:** Global pandemic has taken its toll on the life of millions of people around the world. The use of vaccines might help control spread of the disease. The first vaccine approved in Poland was Comirnaty by Pfizer/BioNTech. A vial contains SARS-COV-2 mRNA embedded in lipid nanoparticles.

**Aim of the study:** The aim of the study is to compare the post-vaccination reaction to COVID-19 vaccine after first and second doses in people infected with COVID-19 with those that did not contract COVID-19.

**Methods:** The data set was gathered from respondents in the age group between 18 and 28 years. The amount of people vaccinated, who had positive RT-PCR results for SARS-CoV-2 [COVID-19(+)] stood at 194, whereas the vaccinated group with negative RT-PCR [COVID-19(-)] comprised 183 persons. The entire probe consisted of 377 people. The symptoms were divided in two groups: local and general. The first comprises injection site pain, redness and oedema, and limb pain. General symptoms include muscle pain, general malaise, headaches, fever and shivers, arthralgia, somnolence, and lymphadenopathy, as for the ones most common.

**Results:** COVID-19(-) respondents pointed to the adverse reaction after the second dose as more severe, while COVID-19(+) respondents declared the side effects after the first dose as more serious. The most common symptom was pain at the injection site in both COVID-19(+) and COVID-19(-), with the frequency of 72-85% and 74-89%, respectively. The incidence of local symptoms in the COVID-19(+) group decreased by 3 to 12% in relation from 1st to 2nd dose. Systemic symptoms in the COVID-19(+) group increased by 0-10% except for the incidence of lymphadenopathy and somnolence, which decreased slightly (2-3%) from 1st to 2nd dose. The incidence of local symptoms in the COVID-19(-) group decreased by 3 to 15% in relation from 1st to 2nd dose. General symptoms in the COVID-19(-) group increased in the range of 7 to 32%, comparing second to first dose. Respondents regardless of the group declared temperature between 37,5 to 38,4 degrees Celsius as most common. Most frequently stated temperature's duration was one day. In COVID-19(-) group no temperature exceeding 39°C was observed. In the remaining groups temperature above 39°C occurred in 3-9% surveyed. In COVID-19(-) group temperature did not last longer than 3 days. In COVID-19(+) group temperature lasted even from 6 to 8 days after the first dose.

**Conclusions:** Assembled data had shown that local symptoms occurred at similar incidence rates after the first dose regardless of the group [COVID-19(+) or COVID-19(-)]. General symptoms were more frequent after the first dose in COVID-19(+) group and after the second dose in COVID-19(-) group.

## **Covid - 19 - a short story about fear and aggression**

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### **Tutors:**

**Introduction:** The COVID-19 pandemic has forced people to live in a completely new reality. However, it has been known for a long time that the perspective of the world around influences the way of coping with its difficulties and impacts human behavior. It is common for fear to enhance aggression. Such mixed feelings usually synergise into frustration and helplessness, leading to dismantle the usual ways of emotional management.

**Aim of the study:** The aim of the study was to identify the worldview factors influencing aggression and fear of COVID-19 among students of various faculties all over Poland.

**Materials and methods:** The study has been conducted by using a two-part, anonymous questionnaire. The first part required general information, collected data on exposure to COVID-19 infection and disease statistics among respondents and their relatives and included a subjective assessment of the actions taken in relation to the pandemic. The second part consisted of relevant research questionnaires: Fear of Covid-19 (FOC), World Assumption Scale (WAS) and the first part of STAXI-2, which examines state anger. After getting the results, participants were divided into three almost equal groups, based on intensity of their fear and their aggression, obtained from STAXI-2 and FOC questionnaires.

**Results:** The median score of part one of the STAXI-2 questionnaire was  $25.92 \pm 9.19$  (N=231). In the first group (N=78), the scores were 13 - 20, with the median  $17.32 \pm 1.69$ . In the second group (N=77), the scores were 21 - 29, with the median  $24.17 \pm 2.76$ . In the third group (N=76), the scores were 30 - 60, with the median  $36.78 \pm 6.67$ .

The median score of part one of the FOC questionnaire was  $13.77 \pm 4.92$  (N=231). In the first group (N=70), the scores were 7 - 10, with the median  $8.54 \pm 1.15$ . In the second group (N=83), the scores were 11 - 15, with the median  $12.90 \pm 1.25$ . In the third group (N=78), the scores were 16 - 31, with the median  $19.38 \pm 3.43$ .

In the WAS questionnaire, the benevolence of the world and the worthiness of the self, correlated negatively with STAXI-2 score (R= -0.24; R= -0.29;  $p < 0.05$ ). The meaningfulness of events correlated negatively with FOC score (R= -0.19;  $p < 0.05$ ).

**Conclusions:** The hardships that the participants overcome during such an unusual, worldwide crisis, have a huge influence on their assumptions about society and their own causative abilities. Aggression rises steeply when people lose a sense of being part of a community. It is because misfortune times create no longer kind and confident humans, but rather sly ones. What is more, imminence of the disease, that seems to linger around everyone, adds fear to an already overly stressed society. Our suggestion is to work in a nearby environment in order to reinforce the feeling of unity, since all of us, medical staff, patients and our families are affected by the pandemic on a similar level.

## Digital screens pandemic

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**Presenting author:** Karolina Nowak

**Tutor:** Prof. Dorota Pojda-Wilczek, Prof. Ewa Mrukwa-Kominek

**Introduction:** The COVID-19 pandemic has widely affected the lifestyle of children and adolescents. Increased time spent at home, the introduction of distance learning, and the transfer of many aspects of life to webspace necessitated an increase in the amount of time spent using mobile electronic devices.

**Aim of the study:** The study aims to examine the use of mobile electronic devices by children and adolescents during social isolation due to the COVID-19 pandemic.

**Materials and Methods:** The study was performed between November 11th, 2020, and January 10th, 2021. An interactive anonymous survey based on self-designed questionnaire consisting of 25 questions (including social parameters as well as questions related to the usage of electronic mobile devices and accompanying ophthalmic complaints) was used. Inclusion criteria: parents of children aged 2 between 14 years and adolescents aged 15 between 18 years. Exclusion criteria: non-use of mobile electronic devices. The data was statistically analyzed.

**Results:** Total of 2581 respondents (59.0% females, 41.0% males) in age range: 2-4 years (2.1%), 5-8 years (9.5%), 9-14 years (23.2%), 15-18 years (65.2%) were included. 73.0% of participants declared that their single and total time spent using electronic mobile devices during the day increased during the COVID-19 pandemic compared to the time before. Spending more time (>1 hour) using mobile devices before isolation is associated with spending more time using it at present ( $T=23,399$ ,  $p<0.05$ ). 66.5% of the study group changed the main purpose of using these devices to distance learning. The most commonly used device before the SARS-CoV-2 was a smartphone. At present, it is a laptop. 55.2% of those respondents who took regular breaks from using mobile electronic devices before the pandemic, take irregular breaks now. 50.7% of those participants who did not reach for another device while taking breaks from using one device, started to do so. There is an overall increase in the time spent using mobile devices in the dark now rather than before isolation ( $T=98,987$ ,  $p<0.05$ ). 71.6% of those who experience eye complaints when using electronic mobile devices, reported that these complaints worsened during the isolation.

**Conclusion:** The COVID-19 pandemic changed the way children and adolescents use mobile electronic devices, reinforcing related bad habits. The results of this study may influence not only children, adolescents and their parents by raising awareness of mobile electronic devices use, but also teachers and politicians, who are in charge of designing distance learning programmes. Decreasing the amount of time children and adolescents spend in front of digital screens is crucial to reducing associated discomfort, especially eye complaints.

## **Discrimination based on sexual orientation: prevalence and links with psychological distress among students of Vilnius University**

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Vilnius University Faculty of Medicine

**Presenting author:** Augusta Valentukevičiūtė

**Tutor:** MD Aušra Šapranauskienė

**Aim of the study:** 1) to examine the noticed and experienced cases of discrimination based on sexual orientation among homosexual, bisexual and heterosexual Vilnius University students; 2) to compare our results with EU and Lithuanian survey data; 3) to investigate discrimination cases in the Vilnius University environment and its possible impact on psychological distress.

**Material and methods:** A questionnaire survey was conducted to students of Vilnius University with help from the University LGBT+ group, Lithuanian Gay League, and internet website Gayline.lt. The questionnaire includes a CORE-OM test to assess psychological distress and several questions about sexual orientation, perceived and experienced discrimination on the grounds of sexual orientation in society, its frequency, and nature, questions about sexual minority respondents' discrimination based on sexual orientation in the environment of Vilnius University, its sources, and frequency. 331 valid forms were included, distinguishing 2 control groups (heterosexual men (N=40) and women (N=153)) and 4 research groups (homosexual men (N=41) and women (N=23), bisexual men (N=18) and women (N=56). Statistical analysis was performed with R 3.3.2 program Commander and IBM SPSS 21.0 program.

**Results:** Among all study groups, homosexual (55%) and bisexual (39%) men claimed to experience discrimination on the grounds of sexual orientation over a 12-month period the most often. Bisexual women (21%) claimed to be discriminated against on the grounds of sexual orientation at the least. All CORE-OM values for bisexual people (both sexes) were higher. Values of risk subscale (to self or others) were higher in homosexual respondents. Psychological distress measures were higher in those respondents who: 1) claim to notice humiliating on the grounds of sexual orientation; 2) hear negative comments related with sexual identity; 3) hide their sexual orientation.

**Conclusions:** Homosexual and bisexual men were the most likely to experience discrimination. Sexual minorities who experience discrimination in the VU environment are associated with higher psychological distress levels.

## Do students adhere to the guideline on proper use of face masks during COVID-19 pandemic?

Marta Szepietowska

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**Presenting author:** Marta Szepietowska

**Tutors:** MD PhD Rafał Białynicki-Birula

**Introduction:** Covering the mouth and nose became the common standard during the COVID-19 pandemic.

**Aim of the study:** This study was undertaken to evaluate if students at universities adhere to international recommendations on the correct use of face masks and if there are differences between medical and non-medical students in their attitudes on proper mouth and nose covering.

**Material and methods:** The study was based on the survey created with Google® Forms and posted on numerous Facebook® groups. The crucial part of the questionnaire constituted of seven questions of WHO guidance on the correct use of face masks. Compliance with a criterion was documented when the chosen answer was “always/nearly always”. The data were collected between 1st and 7th of October 2020. Statistical analysis was performed with Chi-square test and logistic regression analysis.

**Results:** Responses were obtained from 1173 students (mean age: 20.9±2.9 years). There were 665 medical students (56.7%) and 508 (43.3%) non-medical students. Only 3 students (0.3%) were fully compliant with all WHO criteria with significant difference ( $p < 0.001$ ) between medical and non-medical students (2.0% and 0.4%, respectively). Analysing particular criteria “strict covering of the nose and mouth” was most commonly complied (81.2%); “avoidance of touching the mask with hands” appeared to be the most difficult criterion to comply with (2.8%). Self-reported sensitive skin and itch predisposed respondents to the lack of adherence to criterion “strict covering of the nose and mouth” (Odds ratio (OR) 0.7,  $p = 0.001$  and OR 0.58,  $p = 0.0007$ , respectively).

**Conclusions:** The adherence of university students to all WHO guideline on the correct use of face masks is very low. Medical students seem to be more compliant with these recommendations.



## **Emotional helplines: how much do the psychiatrists and resident doctors in psychiatry know about them?**

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**Tutors:** Prof. Alvydas Navickas

**Aim of the Study:** Assess the knowledge of doctors working in the field of psychiatry (psychiatrists, resident doctors in psychiatry) about emotional support lines, their types, contacts. Determine how often do survey participants recommend patients to seek support using emotional helplines.

**Methods:** 35 doctors (psychiatrists and resident doctors in psychiatry) were interviewed. The questions in the questionnaire included respondent's professional specialization, demographic data (age, gender), types of known emotional support lines, their contacts, subjective evaluation of frequency recommendations to contact the emotional support helpline.

**Results:** Among the surveyed doctors the „Youth line“ was the most-known line of emotional support. „Children's Line“ (14 (40%)), „Silver Line“ (12 (34%)), „Helpline for Women“ (11 (31%)) were mentioned less frequently. The majority of the interviewed physicians indicated that they generally recommend patients to seek help in emotional support helplines. When asked about the frequency of recommendations, 1 (3%) indicated that they never recommend contacting the emotional support line, 17 (49%) recommend rarely, 14 (40%) – moderately, 3 (9%) – common, and 0 (0%) – very common. According to the interviewed doctors, patients with neurotic, stress-related and somatoform disorders (F40-F49), mood disorders (F30-F39) and organic and symptomatic mental disorders (F00-F09) were the most likely to contact emotional support helplines.

**Conclusions:** The majority of doctors recommend their patients to reach help using emotional helplines, but only 3 out of 35 were able to write at least one telephone number of the emotional helpline.

## **Evaluation of toilet habits and self-awareness of constipation statuses among young adults from different faculties at Acibadem University**

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Acibadem University School of Medicine

**Presenting author:** Atahan Durbas

**Tutors:** Prof. Özdal Ersoy, Prof. Özdal Ersoy

**Aim of the study:** This study aims to evaluate Acibadem University students' self-awareness of their constipation statuses and investigate whether there is an association between constipation and prolonged sitting time in the toilet affected by toilet habits.

**Materials and methods:** This cross-sectional study was conducted from March 7 to April 3, 2019, at Acibadem Mehmet Ali Aydınlar University. The questionnaire consists of 3 parts and a total of 16 questions. The first part asked about the participants' gender, age, faculty, and school year to collect their demographic information. The second part investigated participants' awareness of constipation and factors affecting constipation. The last part included questions about toilet habits and their sitting time in the toilet. The constipation status of participants was evaluated using the Rome IV Diagnostic Criteria and the self-awareness of participants about their constipation statuses was assessed.

**Results:** 293 students from 5 different faculties (Medicine, Pharmacy, Medical Engineering, Nutrition & Dietetics, and Psychology) of Acibadem University participated in our study. Our results showed that 22.54% of students were appeared to be constipated. Out of all the students, 24.45% of them were unaware that they were constipated. The use of smartphones was the most common toilet habit, and it increased the time spent sitting on the toilet. Constipation was seen at higher rates among students who spent a longer time on the toilet.

**Conclusions:** Our study demonstrated that having toilet habits increased the time spent sitting on the toilet. Our study also found that as the time spent on the toilet increased, the prevalence of constipation among participants increased accordingly. Poor eating habits and sedentary lifestyles of young adults may have a cumulative effect on constipation. Raising public awareness regarding proper defecation routines and limiting toilet habits and sitting time on the toilet seems essential to prevent constipation.

## How can we reduce the socio-economic burden of breast cancer?

Katarzyna Barańska

1 - Medical University of Gdańsk

**Presenting author:** Katarzyna Barańska

**Introduction:** Breast cancer is the most commonly diagnosed cancer amongst women. According to the Social Security Administration, more than 56,000 medical certificates for breast cancer were issued in 2020, which translated into 1,317,535 days of sickness absence due to breast cancer. Breast cancer also ranked 17th among disease entities causing the longest absenteeism. Absenteeism from work leads to a decrease in the Gross Domestic Product.

**Aim of the study:** This study aimed to explore the role of the rehamanager in the return-to-work process of breast cancer survivors.

**Material and methods:** A questionnaire was posted to all breast cancer survivors being members of the OmeaLife Foundation. The questionnaire included questions of the socio-economic situation and demand for support from the rehamanager.

**Results:** In total, 114 patients completed the questionnaire between November 2020 and December 2020. The results demonstrated that 68% (n=77) of patients believed that the rehamanager's support would help them return to work faster. Seventy-one percent of respondents claim that rehamanager support should be offered at every stage of patient treatment. The respondents indicated the need to educate employers because of their reluctance and fears related to the employee's cancer delayed return to work by breast cancer survivors. Lack of substantive support and fears of returning to workforce patients to apply for a disability pension.

**Conclusion:** This study yields insights into the job situation of breast cancer survivors and specifically the role of rehamanager. Given the growing cohort of breast cancer survivors and the increased importance of promoting and supporting the return-to-work process, I advise providing rehamanager support at every step of patients' treatment.

## How physically active were Polish university students during COVID-19 pandemic?

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Medical University of Warsaw

**Presenting author:** Alicja Jodczyk

**Tutors:** MD PhD Daniel Śliż

**Introduction:** The COVID-19 pandemic and the Polish governmental restrictions influenced every domain of life. Students are a particularly affected group. Most of university classes transitioned to online, home-based learning. Staying at home to prevent the spread of the virus, quarantine periods, closure of fitness clubs, gyms, swimming pools could have changed Physical Activity (PA) of university students and led to being largely inactive.

**Aim of the study:** To assess how physically active were students of Polish universities during an average week of the pandemic.

**Materials and methods:** We designed an online survey and shared it via different social media channels (from 22nd February 2021 to 16th March 2021). The questionnaire contained questions from IPAQ- Short Form and one author's question. We collected data from 1491 Polish students, 1200 of them met the study conditions. 77,25% of responders were females, 22,25% were males, 0,5% did not specify gender. 49,75% were medical university students. We measured BMI index and level of physical activity for every person (number of active days/week, activity type and duration, mean sitting time/day). We asked a summary question about subjective opinion on person's PA during pandemic (scale -5;+5). Basing on data - we calculated walking, moderate, vigorous, and total MET-min/week and classified each person into one of the 3 categories: low, moderate, and high PA.

**Results:** 33,17% (n=398) of students were in low, 41,42% (n=497) in moderate and 25,41% (n=305) in high PA category. Average sitting time was 9,27 h/day. Average BMI was 22,26 kg/m<sup>2</sup>. 11,5% (n=138) participants were underweight (BMI<18,5), 69,91 % had normal weight, 14,67% (n=176) were overweight (BMI≥25,0) and 3,92% (n=47) obese (BMI≥30,0). Studying at a medical university was correlated with a higher amount of physical activity. Correlation between higher BMI and lower total MET-min/week value was not statistically significant.

71,92% (n=863) of responders reported that the pandemic negatively influenced their physical activity level, 8,25% (n=99) did not see any changes and 19,83% (n=238) noticed a positive impact.

**Conclusion:** Over 30% of Polish students did not meet the criteria to be classified as 'moderate' which is defined as accumulating a minimum level of activity. Students spent most of the day sitting. Most of them saw negative changes in their PA during the COVID-19 pandemic. This can lead to a higher risk of cardiovascular disease and a range of chronic health conditions in the future. Maintaining regular physical activity and exercising in a safe home environment is essential for healthy living during the pandemic.

## Interprofessional collaboration in the renal care settings – experiences in the COVID-19 era

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**Presenting author:** Kaja Kendyś

**Tutors:** Ewa Pawłowicz, prof. Michał Nowicki

**Introduction:** The role of interprofessional collaboration in health care for diagnostic and therapeutic success is increasingly emphasized. A good practice in this area may lead to reduced hospitalization time or better patients' compliance with medical recommendations. Due to significant comorbidity in patients with kidney diseases and the need to provide care to patients who require highly specialized medical procedures, proper collaboration between medical and nursing staff is an essential component in renal care. During the COVID-19 pandemic, the existing and proven collaboration mechanisms were put to the test.

**Aim of the study:** The aim of this study was to assess the interprofessional collaboration in the renal care settings in the era of COVID-19 pandemic.

**Material and methods:** The survey consisted of the Assessment of Interprofessional Team Collaboration Scale II (AITCS-II; consisted of three subscales – partnership (8 items), cooperation (8 items), and coordination (7 items), maximum of 5 points), questions about work conditions and factors influencing work during the SARS-CoV-2 pandemic, as well as demographic data. The survey was distributed among employees of four renal care settings (three hospital wards with dialysis units and one separate dialysis unit). 78 participants filled out the survey – 87% were women. 30.8% of participants were physicians, 64.1% - nurses and 5.1% - other staff members, i.e. administrative assistants. Mean length of experience in the current team was  $10.3 \pm 11.2$  year in the group of physicians and  $15 \pm 12.3$  years among nurses.

**Results:** Particular aspects of the interprofessional collaboration were assessed by physicians and nurses, respectively, as follows: partnership  $4.1 \pm 2.5$  vs.  $3.6 \pm 1.6$   $p=0.007$ , cooperation  $4.3 \pm 3$  vs.  $3.6 \pm 1.9$   $p=0.0008$  and coordination  $3.9 \pm 2.1$  vs.  $3.4 \pm 1.6$   $p=0.02$ . The workplace (hospital ward, dialysis units, both settings) did not influence the collaboration rates. 46% of nurses and 53.6% of doctors agreed or strongly agreed that the collaboration worsened during the pandemic. 48% of nurses and 54.1% of doctors admitted that the doctors-nurses communication has significantly impeded at the time of pandemic. Increased level of stress, new pandemic procedures and the fear of getting infected with SARS-CoV-2 were, according to the participants, the most significant factors for the worsening of collaboration rates.

**Conclusions:** The exceptional circumstances faced in the time of pandemic have a significant impact on interprofessional collaboration in healthcare, which may influence patients' satisfaction and safety. An active support for health care teams in the field of collaboration, partnership and cooperation is especially important in this challenging reality.

## **Is it Necessary and Feasible to Set up Ambulatory Palliative Care and Home Palliative Care Services in Iasi County?**

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**Presenting author:** Teodora-Emanuela Truica

**Tutors:** Prof. Vladimir Poroch, Prof. Mihaela Boanca

**Introduction:** Palliative care services have the role of providing holistic care to patients with life-threatening and life-limiting conditions. These services aim to improve the quality of life for patients and their families, through a physical, psychosocial and spiritual approach of the illness.

**Aim of the study:** The purpose of this study is to find out if the population of Iasi County is informed about the existence of ambulatory palliative care and home palliative care services. Also, this study wants to determine the need and addressability for this type of services in the population.

**Method:** 81 questionnaires were administered in November 2018. A number of 75 respondents (valid answers) from Iasi County answered, having different ages (18-69 years old), occupations, income level, sex (22 men and 53 women), and environment of residence (16 people live in rural areas and 59 in urban areas). The application of the questionnaire was done face to face with the interviewee, and the data has been collected and processed in MS Excel. Study participants were informed that the data provided in the questionnaire are confidential, anonymous and used for scientific purposes.

**Results:** It turns out that the population is not aware of the existence of ambulatory palliative care structures and home palliative care providers (approximately 96% of the population is unaware of the existence of such structures). The explanation lies in the fact that they exist in Iasi County only to a very small extent (1 supplier of ambulatory palliative). Respondents almost unanimously (87%) consider that the existence of palliative care ambulatories and home palliative care providers would be extremely useful. 60% of respondents had at least one experience related to a loved one diagnosed with an incurable disease and 62% of respondents were involved in the care of a close person diagnosed with an incurable disease. Most of the respondents (83%) would use ambulatory palliative care and home palliative care services, which shows that the establishment of such services would be a feasible business.

**Conclusions:** In conclusion, it is necessary to have ambulatory palliative care and home palliative care services, because, once informed about the existence of these services, most people would consider them useful.

## **Problems of Dye Workers in the selected area of old Dhaka city, Bangladesh Ashish**

Ashish Paul

Dhaka National Medical College, Dhaka, Bangladesh

**Presenting author:** Ashish Paul

**Tutors:** Prof. Nahid Sultana

**Aim of the study:** The aim of this study was to determine the common health problems, their socio-economic condition, knowledge and use of personal protective equipment.

**Material and methods:** A cross sectional type of descriptive study was conducted among 40 respondents of the male dye workers. A Convenient type of non-probability sampling was done. Structural questionnaire was used as research instrument. Graphical presentation (pie chart), tables were applied and analyzed by SPSS 20 programme.

**Results:** Among the 40 male respondents, 16(40%) earn (9000-11000) taka monthly. 22(55%) had primary education. 37(92.5%) had the idea about harmful effect of dye. 26 (72.2%) had itching, rash & redness in the skin. 4 (11.1%) had skin pigmentation, 4(11.1%) had thickening of skin of the palm and 2 (5.6%) had skin desquamation. 20(52.63%) had the problem of cough & breathlessness, 7(18.4%) had cough with sneezing & 11(28.9%) had bronchial asthma. 10(40%) had hair fall problem. 15(50%) had itching & redness in eye, 2(6.7%) had vision problem. 5(16.7%) had swelling of eyelid, 8(26.7%) had itching & redness with lacrimation. 40(100%) had the idea about using personal protective equipment. 9(22.5%) had used personal protective equipment.

**Conclusions:** Reluctance about health awareness, low income and lack of health education are the main causes of different health problems among the dye workers.

## **Menstrual symptoms among young women and impact on educational attainment in Latvia Public Health**

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Rīga Stradiņš University

**Presenting author:** Lauma Gulbe

**Tutors:** MD Elizabete Pumpure

**Introduction.** While some women manage their monthly periods easily, others experience a number of physical and emotional symptoms. Painful menstrual periods are one of the main reasons for gynaecological consultation amongst young women. It is an important female health aspect with possibly negative impact on school activities and psychological status.

**Aim of the study.** To determine what menstrual symptoms (MS) young women experience and whether they have an impact on educational attainment and everyday life.

**Materials and method.** A cross-sectional study was conducted online, distributed on social network Facebook in March 2021. Data were collected from 304 self-filled questionnaires in GoogleForms of high school and university female students, further analyzed with SPSS 26.0.

**Results.** Mean age of respondents was 21.3 years (SD 3.3, range 15-33) and majority of them were university students (73%, n=222). Most common MS were described as menstrual cramps in lower abdomen (87.2%,n=265) and mood swings (70.1%,n=213). Pain was categorized in a scale from zero (no pain) to five (unbearable pain). 45.7%(n=139) described pain as “0/5 none”, “1/5 light” or “2/5 medium”, but without impact on daily activities. Pain level 3/5 and higher had impact on everyday life and was experienced by 54.3%(n=165) of women. 9.5%(n=29) experienced even 5/5 unbearable pain. Due to the severe menstrual pains, 8.6%(n=26) have sought emergency medical care. Vast majority of respondents (89.1%,n=271) use medication to relieve MS, such as ibuprofen (82.3%,n=223) and drotaverine (38.4%,n=104). Significant effects on education were observed, as 79.6%(n=242) admitted having difficulty to focus on studies during period days and 48.7% (n=148) have skipped classes and school days because of MS. Higher overall pain level (3/5 and higher) correlates with attention difficulties ( $p<0.001$ ) and unattendance of studies ( $p<0.001$ ). More than half of women (53%,n=161) believe that menstrual pain is the norm and no additional attention needs to be paid to it. Three in four women (73.4%,n=223) have reached out for help to reduce MS, but only for half of them (56.4%,n=155) symptoms decreased as result.

**Conclusions.** Menstrual cramps are identified as the most common of MS among young women students and has significant impact on academic performance. Pain during period is underrated and it is crucial to focus on strategies to improve pain and symptom management, therefore, to improve the quality of life of young women.



## **Perception of medical students at the University of Beira Interior in Portugal regarding the use of cannabis for medicinal purposes**

Ricardo Graças

Universidade da Beira Interior - Portugal

**Presenting author:** Ricardo Graças

Tutors: MD PhD Abel Abejas

**Introduction:** Cannabis is an increasingly talked about plant regarding its medicinal use. Most European countries allow, or are considering allowing, the medical use of this substance. However, scientific evidence regarding the efficacy of medical cannabis is still limited, which is reflected in the absence of duly adequate clinical guidelines. In terms of ethics and public health it is also the subject of much controversy. The opinion about the legalization of medical cannabis among medical students is very important since they are potential prescribers as future doctors.

**Aim of the study:** Survey the opinion and knowledge of medical students at the University of Beira Interior regarding the use of medical cannabis. Compare the answers according to the academic year and the consumption habits of the substance.

**Material and methods:** Descriptive and cross-sectional observational study with application of an anonymous online questionnaire to 979 medical students from the University of Beira Interior enrolled in the academic year 2019/2020. The completion of the questionnaire was available in the months of March, April and May 2020. Subsequently, the sample was statistically analyzed using the software Statistical Package for Social Sciences® version 26, with the Chi-square, Fisher and Mann-Whitney tests.

**Results:** 310 responses (31.66%) were obtained, of which 239 were female (77.1%) and 71 were male (22.9%). Among respondents, 19.7% consumed cannabis occasionally or regularly, with males (44.6%) being more frequently consumers ( $p < .001$ ). Most students (93.9%) considered to be in favor of the legalization of medical cannabis. Chronic pain (92.6%), cancer (71.9%) and epilepsy (53.9%) were the most indicated therapeutic applications by students, with cancer ( $p = .010$ ), epilepsy ( $p = .020$ ) and multiple sclerosis ( $p = .043$ ) being significantly more mentioned by consuming students. Only 32.4% of students would recommend the illicit use of this substance in case of proven benefit. The absence of scientific evidence (57.9%) and the frequency of adverse effects (57.9%) were the main reasons cited by students against the legalization of this substance. Most students (98.4%) considered the need for further training and research in the area.

**Conclusions:** Medical students at the University of Beira Interior who answered the questionnaire are in favor of the legalization of medical cannabis, know some therapeutic applications, would not recommend this substance if it was illegal and want more training on this subject. It is also concluded that the history of cannabis use by students correlates with more knowledge regarding the medical applications of cannabis.

## Red blood cell transfusion practice in a single institution in Poland – is there room for improvement?

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**Presenting author:** Aleksandra Spień

**Tutors:** MD PhD Piotr Czempik

**Introduction:** Red blood cell (RBC) transfusion (RBCT) is one of the most frequently performed procedure in inpatients. Aging population and rising number of surgeries performed in elderly population causes an increased demand for blood products.

**Aim of the study:** We aimed to analyse RBCT practise in a university-affiliated medical center in Poland in order to find if there is room for improvement in the current practise.

**Material and methods:** We performed retrospective analysis of all RBCTs performed in years 2018-2019 in the University Clinical Centre of the Medical University of Silesia. Basic demographic and clinical data of RBC recipients and details regarding RBCTs were retrieved from the hospital electronic health records (AMMS, Asseco Medical Management Solutions, Poland).

**Results:** In the analysed perdioid 3991 RBCs were transfused to 1133 patients. The most frequent primary diagnoses of RBC recipients were: malignant neoplasm (257; 18.1%), internal bleeding (171; 12%), gastrointestinal disease (143; 10%). Mean number of transfused RBC per patient was 3.5 generally and in individual departments between 1.3 (Neonatology) and 3.9 (Anaesthesiology & Intensive Care). The most frequently used type of RBC was RBC without buffy coat (75.1%) and leucodepleted RBC (20.9%). The overall median pre-transfusion Hb concentration was 74 (IQR 67-81) g L<sup>-1</sup>. The median Hb concentrations following 1 and 2 units of RBC were 81 (IQR 74-90) and 96 (IQR 88-104) g L<sup>-1</sup>, respectively.

**Conclusions:** Analysis of our local RBCT practice showed significant room for improvement. Areas for improvement were type of ordered RBC, multiple unit transfusions for non-bleeding indications, lack of lactate determination as a sign of anaerobic metabolism pre-post transfusion.

## **Relationship between gender identity and psychological distress among homosexual, bisexual and heterosexual students of Vilnius University**

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Vilnius University Faculty of Medicine

**Presenting author:** Augusta Valentukevičiūtė

**Tutors:** MD Aušra Šapranauskienė

**Aim of the study:** The aim of the study was to examine how homosexual, bisexual and heterosexual students of Vilnius University evaluate their gender identity and identify a possible link between gender identity and psychological distress.

**Material and methods:** An online anonymous questionnaire survey was conducted to students of Vilnius University with a help from University LGBT+ group, Lithuanian Gay League and internet website Gayline.lt. The questionnaire includes CORE-OM test to assess psychological distress and several questions based on how "feminine" or "masculine" (according to socially constructed gender norms) the study participant thinks to be on a scale from 1 to 10 (1 – "very masculine", 10 – "very feminine"). 331 valid forms were included. The study groups consisted of 2 control groups (heterosexual men (N=40) and women (N=153) and 4 experimental groups (homosexual men (N=41) and women (N=23), bisexual men (N=18) and women (N=56). Statistical analysis was performed using the R 3.3.2 Commander package and IBM SPSS 21.0 program.

**Results:** Bisexual women consider themselves significantly more "masculine" than heterosexual women. Heterosexual men consider themselves significantly more "masculine" compared to heterosexual women. Bisexual men consider themselves more „masculine“ than heterosexual women. Homosexual men and homosexual women rate their "masculinity"/"femininity" without statistically significant differences. It has been observed that the linkage between psychological distress and "femininity" show a negative correlation – the more a heterosexual and bisexual woman considers herself to be "feminine", the less psychological distress she experiences.

**Conclusions:** Significant differences in gender identity estimates were observed among study and experimental groups. A possible link was identified – a negative correlation between psychological distress and „femininity“ in heterosexual and bisexual women was identified.

## Resilience, well-being and burnout among medical students in the COVID-19 era

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**Presenting author:** Joanna Forycka

**Tutors:** MD Ewa Pawłowicz, Prof. Michał Nowicki

**Introduction:** Recent reports indicate that COVID-19 pandemic has significant influence on medical professionals' mental health. There is also need to evaluate medical students' psychological condition, since this population is affected by the current situation at educational, social and personal levels. Strict limitations in clinical practice and social interactions within academic community, which had to be introduced, could lead to significant psychological distress in medical students (MSs).

**Aim of the study:** The aim of the study was to assess resilience, well-being and burnout among MSs in the COVID-19 era and determine the impact of different factors: preexisting mental condition, SARS-CoV-2 infection among the respondents or their relatives, on-line and hybrid university classes and voluntary activities at the pandemic frontline.

**Material and methods:** The online survey consisting of well-validated questionnaires assessing resilience (Resilience Scale 14; RS-14), well-being (Medical Student Well-Being Index; WBI) and burnout (Maslach Burnout Inventory: General Survey for Students; MBI-SS) as well as additional questions with a focus on above-mentioned factors were distributed via Facebook and other online students' platforms. 1858 MSs from all Polish medical schools (1435 women, 407 men, 5 of the other sex, 11 – no data (ND); 325 1st-year MSs (1MSs), 384 2MSs, 411 3MSs, 313 4MSs, 248 5MSs and 169 6MSs; 8 ND) agreed to fill in the survey.

**Results:** Very low, low and on the low end levels of resilience were found in 25.8%, 19% and 27% of the study group, respectively. The mean RS-14 score among students with preexisting mental conditions was  $60 \pm 13.5$  (low level) vs.  $66.9 \pm 12.9$  (on the low end level) in those not reporting such problems ( $p < 0.001$ ). Self-reported preexisting mental health problems was associated with higher WBI scoring ( $4.8 \pm 1.4$  vs.  $4.1 \pm 1.7$ ;  $p < 0.001$ ). All burnout dimension scores differed significantly, i.e. students reporting preexisting mental conditions presented higher exhaustion ( $21.3 \pm 6.3$  vs.  $18.8 \pm 6.8$ ;  $p < 0.001$ ) and cynicism ( $19.8 \pm 7.6$  vs.  $16.8 \pm 8.2$ ;  $p < 0.001$ ) and lower professional efficiency ( $15.8 \pm 6.3$  vs.  $17.6 \pm 6.5$ ;  $p < 0.001$ ). The SARS-CoV-2 infection both among respondents and their relatives did not influence studied parameters. Students with higher resilience level presented better attitude towards on-line and hybrid classes. 16.8% of respondents stated that they worked, currently work or plan to work voluntarily at the pandemic frontline. In terms of burnout, these respondents presented lower exhaustion ( $p = 0.003$ ) and cynicism ( $p = 0.02$ ), and higher professional efficiency ( $p = 0.002$ ). That group was also characterized by greater resilience ( $p = 0.046$ ).

**Conclusions:** Medical students are severely exposed to the negative psychological effects of the pandemic. Providing necessary support, especially by building up the resilience, to this vulnerable group seems crucial to minimize mental health harm of COVID-19 pandemic.

## **Sleeping disorders during COVID-19 pandemic in a Polish population, questionnaire assessment**

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**Presenting author:** Magda Piekarska

**Tutors:** MD PhD Daniel Śliż, PhD Damian Parol ,MSc Paweł Szewczyk

**Introduction:** COVID-19 pandemic and abiding restrictions have impacted every life domain. Research of sleeping disorders during COVID-19 pandemic is limited. Sleep disturbances are a major health issue which is associated with higher prevalence of metabolic syndrome, diabetes mellitus, obesity and great psychological burden.

**Aim of the study:** Assessment of the prevalence of sleeping disorders during the COVID-19 pandemic in a Polish population.

**Material and methods:** An online survey was distributed via social media channels. The questionnaire consisted of sociodemographic questions, Athens Insomnia Scale (AIS) and Epworth Sleepiness Scale (ESS). Data were collected from 1987 people, 1956 met all study conditions. **84% (n=1649) were females, average age was 30 years (SD=8,37). Chi square tests were performed.**

**Results:** 36,04% (n=705) respondents declared that they noticed a change in the quality of their sleep during the last year. According to AIS and ESS 56,85% (n=1112) respondents suffered from sleeping disorders; 49,13% (n=961) answerers suffered from insomnia; 23,0% (n=451) suffered from sleepiness. Females suffered from insomnia or sleepiness more often than males: 50,21% females vs 43,22% males suffered from insomnia ( $p<0,05$ ), 24,86% females vs 13,36% males suffered from sleepiness ( $p<0,05$ ). Smokers suffered from insomnia more often than non-smokers (58,02% vs 47,87% respectively,  $p<0,05$ ). Using electronic devices before going to bed everyday was associated with higher prevalence of insomnia (50,76% vs 37,29%,  $p<0,05$ ). Associations between higher prevalence of sleeping disorders and more frequent use of alcohol, drinking coffee 5 or less hours before going to bed were not statistically significant.

**Conclusions:** The prevalence of sleeping disorders among respondents was high. Females were more prone to suffer from sleeping disturbances. It is worth noting that some anti-healthy behaviours such as smoking or especially using electronic devices before sleep were associated with higher prevalence of insomnia. Those results may be useful for public health workers in terms of implementing social policies to support people suffering from sleeping disorders.

## **The effects of sexual activity on immune status in COVID-19 susceptible individuals**

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University of Baghdad, College of Medicine

**Presenting author:** Hashim Talib Hashim

**Tutors:** Prof. Talib Manea

**Aim of the study:** COVID-19 disease causing severe acute respiratory disease is becoming more prevalent worldwide and spreading very rapidly with quietly high mortality rates among patients in those countries with high infection rates which are more susceptible to infection due to lack of adequate facilities, in addition to physicians and healthcare workers.

**Materials and methods:** A descriptive, survey-based, cross sectional study was conducted among 16000 participants aged > 18 years old from 33 countries. The survey was conducted as an online survey distributed for the general population in 33 countries for four months.

**Results:** The majority of the people after being in contact with the patients in group 1 (Who have sex > 3 times a month) (76.6%) were not infected and even the infected people were in mild cases in comparison with group 2 (Who have sex < 3 times a month) who have approximately half to half for infected to non-infected people (40.43%).

**Conclusion:** The findings in this study are suggestive of protective role for the sex in COVID-19 infection despite the way of having sex and the age of the person. The sexual activity as it increases, the immunity status becomes more competent to deal with pathogens and this explains lower incidence of disease among those who have sex > 3 times a month in comparison with those who have sex < 3 times a month.

## The evaluation of e-learning at medical universities in Poland by students during the SARS-CoV-2 pandemic

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**Presenting author:** Nicola Dyrek

**Tutors:** MD PhD Piotr Kocetał,

Prof. Magdalena Olszanecka-Glinianowicz, MD PhD Piotr Kocetał,

Prof. Magdalena Olszanecka-Glinianowicz

**Introduction:** The COVID-19 pandemic outbreak in March 2020 affects our society in any dimension. Polish medical universities have been forced to make educational changes to ensure continuity of learning. The aim of the study was to ask the students how they evaluate the different forms of e-learning.

**Materials and methods:** 615 medical students fulfilled online survey.

**Results:** Lectures were held only via the Internet (96.10%), as were seminars (85.53%). The form of clinical classes took place largely in the stationary form (45.37%) and online at 40%.

The level of satisfaction with the remote form of lectures was very good (59.67%) and good (18.70%). The students' opinion of the seminars was similar, (very good 25.20% and good 26.02%). Students' opinion was significantly different in the clinical classes (very bad 27.64% and bad 35.28%).

Students evaluated significantly better classes that took place in a stationary form, compared to online classes (43.3% of neutral opinion and 25.91% of good opinion vs. 32.36% and 27.48%, respectively).

53.98% of the participants chose that it is easier to pass the exam during the pandemic and 26.18% chose it is as demanding as before the pandemic.

71.06% of respondents think that the current situation will lead to worse preparation for the profession. Unfortunately, 27.3% of students learned less during the pandemic and had to spend more time on self-studying (21.713%).

In the opinion of 55.28% of the participants, the universities did not undertake all the measures they could to maintain a high level of education.

**Conclusions:** This analysis is of great importance in the aspect of further teaching with the use of e-learning techniques. The organization of clinical classes need to be tailored to ensure a suitable level of practice knowledge.

Medical universities need to rearrange their abilities to use all available technological equipment and human resources to improve the educational effects.

## **The Internet as a source of medical knowledge for high school and medical students during the COVID-19 pandemic**

Anna Rapiejko

Medical University of Warsaw

**Presenting author:** Anna Rapiejko

**Tutors:** Prof. Piotr Lipiec

**Introduction:** Using online resources is the easiest way to obtain up-to-date medical information, especially in the era of the COVID-19 pandemic. However, unlike medical professionals, high school (HS) and medical (M) students may lack training, which would allow them to find reliable data and prevent them from falling victim to disinformation.

**Aim of the study:** The study aimed to evaluate the use of internet for obtaining medical information by HS and M students during the COVID-19 pandemic.

**Material and methods:** Two anonymous online surveys were made available and distributed through social media among Polish HS and M students in November 2020. The analyzed group consisted of 332 M students representing 12 medical universities and 563 HS students from schools across the country.

**Results:** 33,7% of M students use online resources several times a day to find medical information, whereas 26.5% once a day and 29.2% only once every few days. HS students tend to do that less frequently - 32.2% once every few days and 35.6% less than once a week. In case of 61.5% of M and 63.7% of HS students the COVID-19 pandemic has increased the frequency of getting medical knowledge from online resources. To accomplish that, 75.9% of M and 61.6% of HS students frequently use popular search engines (e.g. Google). 60,8% of M students and 30,4% HS students frequently use Wikipedia. Moreover, news websites (e.g. Onet, Interia) are frequently used by 58.7% of HS students and 19,3% of M students as a source of medical information. Social media are also an important provider of knowledge - the majority of M students (53%) follow institutional accounts, whereas the HS students tend to follow individual users' accounts (48% do it often). Medical databases e.g. PubMed as frequently used source of knowledge was indicated by 28% M students, 52.7% use them rarely.

Importantly, 87.35% of M and 69.75% of HS students express the need for additional classes on COVID-19 in their school curriculum, with about half of them preferring them to be voluntary.

**Conclusions:** The HS and M students very often use online resources to obtain medical knowledge, especially in the era of the COVID-19 pandemic. However, in numerous cases the sources of data lack reliability, which indicates the need for HS education regarding the dangers of disinformation. Importantly, both HS and M students recognize the need of additional classes concerning the COVID-19 pandemic in their school curriculum.



## Thyroid-related health problems in modern society

Izabela Gudewicz

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**Presenting author:** Izabela Gudewicz

**Tutors:** MD PhD Agnieszka Genowska

**Introduction:** The thyroid gland, commonly called the thyroid, is responsible for the secretion of hormones responsible for the proper functioning of the endocrine system. Thyroid dysfunction may be the cause of many diseases such as hyperthyroidism, thyroid cancer or Hashimoto's disease. These diseases are not only related to disorders with the production of hormones, because the autoimmune background or genetic predisposition increases the chance of occurrence those diseases. The morbidity of the above mentioned thyroid diseases among the women is significantly higher than among men.

**Aim of the study:** The aim of the work was to get to know and assess health problems associated with the thyroid in nowadays society.

**Material and Methods:** To analyze the morbidity, the author used the information about the occurrence of thyroid diseases (from the GUS) and thyroid cancer (from KRN). The years 2004 and 2014 were taken into consideration, in a division into a sex and total morbidity on thyroid diseases. Data on thyroid cancer (C73) in the years 2006-2015 were presented with help of sex-related incidence rates. The analysis of consumption of hormonal drugs is related to the 2014.

**Results:** The incidence of thyroid disease in the general women population was significantly higher in comparison to the male population. The morbidity among both sexes in the group of 70 years and more increased in 2014 in comparison to 2004. Both sexes, in a division to the polish regions showed different tendencies. Among men, the rate ranged from 2.8% in the Mazowieckie voivodeship to 0.4% in the Warmińsko-Mazurskie voivodeship. Among women, the percentage ranged from 16% in the Pomorskie voivodeship to 6.9% in the Podkarpackie voivodeship. The morbidity on thyroid cancer in both sexes showed an upward tendency in 2006-2015. In terms of regions and the general population, women were characterized by a higher rate. The highest increase in medicines drug consumption was observed among women in age from 15 to 39 years old.

**Conclusions:** Thyroid diseases in Poland in the last decade showed an increasing trend among both sexes. This indicates the need for systematic prevention in order to guarantee good health, and thus socio-economic profits in the form of saved time and capital.

## **Workplace violence and depression among medical students working in healthcare in Latvia**

Natālija Prohorova,

Rīga Stradiņš University

**Presenting author:** Natālija Prohorova

**Tutors:** MD PhD Artūrs Miksons

**Introduction.** According to the World Health Organization, healthcare workers are at high risk of being exposed to violence all around the world. 8-38% of health care workers suffer physical violence during their careers, while many more are subjected to psychological violence. Medical students might be even at higher risk because of lack of proper experience and knowledge. There is lack of studies about violence among medical students working in healthcare in Latvia.

**Aim of the study.** The aim of the study was to assess violence distribution and depression among medical students working in healthcare in Latvia.

**Material and methods.** This is cross-sectional study performed February to March 2021 via online survey. For workplace violence measurement a validated Negative Acts Questionnaire Revised (NAQ-R) was used and for depression validated Patient Health Questionnaire (PHQ-9) was used. Medical students working in healthcare jobs were included and medical students who never worked in healthcare were included for control group. Data was analysed using IBM SPSS Statistics.

**Results.** 224 Respondents (103 working at the moment of the study, 35 stopped working recently, 86 control group) filled the questionnaire. Mean age was 22.6 (SD 3.03, range 18-38) 87.9 % females. 47.6% of the respondents think they have never experienced violence while working in healthcare, 35% of respondents have experienced violence in current job, 12,6% in one of previous jobs, 2.9% in all previous jobs and 1.9% in many of previous healthcare jobs. Mean score of NAQ-R was 35.05 (SD= 12.99, Maximum = 76) which shows that participants on average were “sometimes bullied” at workplace. 15.5% responded that they experienced violence more often in Covid-19 pandemic. There was no statistically significant difference observed on violence score depending in which healthcare profile student works, also no statistically significant change in violence score on whether student work shift work, night shift and depending on work load or total time of work experience in healthcare. Mean PHQ-9 score was 10.34 (SD=5.79) which indicates moderate depression on average student. There was statistically significant ( $p=0.034$ ) difference of measured violence score among participants with different severity of depression. There was no correlation between NAQ-R total score and PHQ-9 score.

**Conclusions.** Workplace violence is prevalent among medical students working in healthcare in Latvia. Covid-19 pandemic is a contributory factor for workplace violence in healthcare. This sample did not show correlation between experienced violence and depression.

## **RADIOLOGY**

**COORDINATORS: PIOTR KACZMARSKI, SZYMON TURKIEWICZ**

### **JURY:**

**Agnieszka Bianek-Bodzak MD PhD**

**Paweł Cichocki MD PhD**

**Marcin Elgalal MD Ph**

## **Impact of exposure to low dose ionising radiation on selected immune marker levels: A cross sectional study**

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**Presenting author:** Adithya Mohan

**Tutor:** Prof TVSVGK Tilak

**Introduction:** Radiation is energy that travels in invisible waves or rays. Ionising radiation is a vital tool in medicine, routinely used in X-rays, CT scans, etc. While at higher doses, it can cause bone marrow disorders, cataract, cancers, etc, the effect of ionising radiation at low doses, which is what most radiation workers are exposed to, is highly debatable.

**Aim of the study:** The present study aims to explore the effects of low dose ionizing radiation (LDR) on selected immune marker levels in radio technicians.

**Materials and methods:** The study population consisted of two groups- 25 radio technicians recruited from the radiology department of a tertiary care centre, and 25 lab assistants, as the control group, chosen with similar age, sex and duration of employment, without any work related exposure to ionising radiation. Additional demographic data was collected to rule out systemic conditions like diabetes, hypertension, and addictions like chronic smoking and alcoholism. Radiation exposure levels for the past 6 months of the radio technicians was collected from their respective dosimeter readings. Venous blood samples were drawn from the 2 groups and tested for Immunoglobulin profile and Complement proteins 3 and 4 by nephelometry. ELISA was conducted to test for Antinuclear antibodies (ANA) in the samples, to screen for autoimmune disorders. Data was compiled in MS Excel, and quantitative and qualitative parameters were described using mean (SD) and percentages respectively. Data was analysed using SPSS (USA) 23.0.

**Results:** The mean IgG levels of the radio technicians were 44% lower than those of the controls, which was 1265 mg/dL. The mean C3 and C4 levels of the radio technicians was 51% and 41% lower than those of the controls, which was 111 and 29 mg/dL respectively. All the samples were ANA negative, thereby ruling out autoimmune disorders.

**Conclusion:** The levels of IgG, C3 and C4 were significantly lower in the radio lab technicians as compared to the control population. Therefore, while our study points to increased risks for healthcare workers in these labs, it also highlights the need for more protection and awareness for the medical staff in their work environment"

## **Guidelines based role of CT for diagnosis and endovascular treatment of type B Aortic dissection**

**Presenting author:** Strahil Vasilev

**Introduction:** Aortic dissection is acute condition, which is potentially lethal and needs exact and rapid diagnosis. Incidences of this disease are between 3-4 cases per 100 000 people yearly with a tendency for increasing.

**Aim of the study:** The aim of the study is to clarify the role of CT and endovascular techniques in diagnosing and treating AD.

**Materials and method:** We collect the available data from guidelines and important studies in the field of cardiology and radiology and make a clarification according them and our experience.

**Results:** Computer tomography has an important role in diagnosing, assessment and follow up of AD. CT is the preferred imaging modality, because of its high sensitivity and specificity. It is the most used imaging method for aortic pathologies, because of its rapidity, availability and accuracy. The endovascular methods for treating AD are fast-growing, like implanting stent-graft for type B AD, which is already widely used.

**Conclusion:** The aim of this article is to present to the audience the international guidelines and recommendations for type B AD. The emphasis is on imaging diagnostic with CT and endovascular treatment for type B AD.

## **Minimal apparent diffusion coefficient (ADC) cut-off values for histologically proven clinically significant prostate cancer.**

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**Tutors:** MD PhD Mantas Trakymas, MD PhD Ieva Naruševičiūtė,  
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**Introduction:** Prostate cancer is one of the most frequent malignant tumours in a worldwide population of men. Currently, multiparametric MRI analysis based on Prostate Imaging Reporting and Data System (PI-RADS) and targeted biopsy is the most promising diagnostic tool. An apparent diffusion coefficient (ADC) map has the highest prognostic potential but as of now there is no cut-off quantitative ADC value yet recommended by PI-RADS v2.1.

**Aim of the study:** The purpose of our study was to establish ADC cut-off values for prediction of clinically significant prostate cancer (csPCa) in different prostate zones.

**Materials and methods:** This single-center retrospective study was conducted at National Cancer Institute of Lithuania. Our study enrolled 142 patients with 219 mpMRI detected PI-RADS v2.1  $\geq 3$  lesions. mpMRI-ultrasound fusion guided prostate biopsy was performed on every lesion. The minimal ADC (minADC) value from ROI of every lesion was established. Based on the histological data, lesions were divided into Group of no csPCa (Category 0 - benign findings and Category 1 - PCa Gleason score 3+3) and Group of csPCa (Category 2 - PCa Gleason  $\geq 3+4$ ). Statistical analysis was carried out using IBM SPSS Statistics 27 and R Commander.

**Results.** Mean age of the patients included in this study was 64,2 (standard deviation, SD=7,46) and their mean PSAD was 0,175 (SD=1,44.) 219 lesions included 96 (43.8%) of Category 0; 69 (31.5%) of Category 1 and 54 (24.7%) of Category 2. The mean score of minADC was 699.96. Statistically significant differences in mean minADC values were found between the three categories both overall and when assessed separately using ANOVA and post-hoc analysis ( $p < 0,05$ ) (Category 0: 791.96; Category 1: 677.30; Category 2: 565.35). Using binary logistic regression models, minADC cut-off values between the two groups of csPCa and no csPCa were determined as  $718 \times 10^{-6} \text{ mm}^2/\text{s}$  for overall prostate,  $851 \times 10^{-6} \text{ mm}^2/\text{s}$  for peripheral zone and  $666 \times 10^{-6} \text{ mm}^2/\text{s}$  for transition zone. Prediction accuracy of csPCa was 94,4%. Prediction accuracy of no csPCa varied from 37,5 % in the TZ to 55,3 % in the PZ.

**Conclusions.** We suggest  $851 \times 10^{-6} \text{ mm}^2/\text{s}$  for the lesions found in the peripheral zone and  $666 \times 10^{-6} \text{ mm}^2/\text{s}$  in the transition zone as possible cut-off values of ADC for prediction of csPCa.

## Prevalence of arterial aneurysms in group of patients with arteriovenous malformations.

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**Introduction:** Cerebral arteriovenous malformations (AVMs) are rare non-neoplastic vascular lesions with arteriovenous shunting. Their characteristic feature is a dysplastic network of vessels, the nidus. Intracranial haemorrhage remains the main complication of brain AVMs. The risk of such an event may be increased by coexisting aneurysms.

**Aim of the study:** To explore the coincidence of cerebral arteriovenous malformations and intracranial aneurysms.

**Material and methods:** The study included 40 subjects with AVM evaluated retrospectively, based on Digital Subtraction Angiography. The research examined coexistence of AVMs and aneurysms, the number of supplying arteries, median maximal diameter of nidus of AVMs and aneurysms. Statistical analysis was performed using R software.

**Results:** In 18 cases (45%) coexisting aneurysms were found. The average age of the patients was  $45.9 \pm 16.6$  (range 17.8-78.49), 22(55%) of them were female. Malformations were found in the extent of circulation of ACA 10(25%), MCA 19(47.5%) and PCA 25(62.5%). In 14(35%) cases AVMs supplying arteries were multiple, and in 26(65%) single. AVMs supplied by multiple arteries were significantly larger than those supplied by a single artery (median maximal diameter 40mm vs 19mm,  $P < 0.001$ ). Median maximal diameter of AVM nidus was  $25.42 \pm 14.82$ mm, intranidal aneurysm (located within the nidus)  $3.88 \pm 2.84$ mm and extranidal aneurysm  $5.39 \pm 2.51$ mm. All of the intranidal aneurysms were single. Malformations with intranidal aneurysms were significantly smaller than those without (median maximal diameter 10mm vs 25mm,  $P = 0.0227$ ). Patients with intranidal aneurysms were significantly younger (median age 21.25 vs 52.71 years;  $P = 0.0162$ ).

**Conclusions:** Aneurysms are common findings among patients with AVMs. Multiple arterial supply of AVMs has an impact on aneurysms size. Intranidal aneurysms tend to be isolated, smaller in size and occur at a younger age.

## **Magnetic resonance spectroscopy (1H-MRS) to assess microglia activation in immunocompetent patients with Toxoplasma gondii acute lymphadenitis**

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**Tutor:**MD Adam Garkowski

**Introduction:** *Toxoplasma gondii* (*T. gondii*) is cosmopolitan parasite that causes the disease toxoplasmosis. It is alleged that the healthy person's immune system usually keeps the parasite latent from causing illness, and it is commonly said that infection with *T. gondii* is either asymptomatic or cause mild, self-limited illness including, lymphadenopathy and muscle aches. In immunocompromised individuals *T. gondii* infection often can lead to a life-threatening disorder such as those with HIV infection. Interestingly, however, many recent epidemiological studies suggest that in immunocompetent people the latent *T. gondii* infection is associated with a range incidence of neuropsychiatric disorders including schizophrenia, suicide, depression, premenstrual syndrome and more subtle alterations in behaviour. However there have not been any studies assessing the impact of an acute infection with *T. gondii* in potentially healthy adult immunocompetent patients on the central nervous system (CNS) using imaging techniques such as magnetic resonance imaging (MRI), including proton magnetic resonance spectroscopy (1H-MRS). 1H-MRS allows for non-invasively evaluation the metabolic activity in selected brain regions.

**Aim of the study:** In view of the epidemiological human and animal studies from the last decade, we aimed to assess the impact of an acute infection with *T. gondii* on the CNS in immunocompetent persons to identify areas of any damage to the brain using 1H-MRS.

**Material and methods:** Fifteen patients diagnosed with an acute toxoplasmosis and ten healthy volunteers as a control group (with excluded *T. gondii* infection) have been involved in the study. Proton MR spectra were acquired at 3 T MRI scanner with repetition time (TR) = 2000 ms, and echo time (TE) = 30 ms. Single voxels were located in the basal ganglia, frontal, temporal and occipital lobes.

**Results:** We found a statistically significant increase of the myo-inositol/creatine (mI/Cr) ratio within the frontal lobe, basal ganglia and in the temporal lobe in the patients suffered from acute toxoplasmosis. We also observed significantly reduced glutamate–glutamine/creatine (Glx/Cr) ratio in the occipital lobe and reduced N-acetylaspartate/creatine (NAA/Cr) ratio within basal ganglia.

**Conclusions:** A significant increase in mI/Cr ratio, reduction in NAA/Cr and Glx/Cr ratio in patients with acute toxoplasmosis suggests the presence of microglia activation with neuronal dysfunction, and additionally glutamine-glutamate dysregulation.



## Dose optimisation for CT examination of paranasal sinuses: a phantom study

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**Introduction:** Since CT examinations are more commonly used worldwide, it is mandatory to evaluate the harmful effects of ionising radiation, such as oncogenesis, on one's health. Unfortunately, there is a correlation – more radiation means better image quality. Therefore a burning topic in CT imaging are iterative reconstruction (IR) techniques. They are applied to diminish image noise, compensating poor image quality determined by reduced ionising radiation dose.

**Aim of the study:** To find the most optimal IR technique allowing to perform paranasal sinus CT examinations with lower radiation doses, maintaining diagnostic informativity of the image.

**Materials and methods:** Five CT image series of paranasal sinuses of a PIXY antropomorphic human training phantom were scanned with a 64-slice Philips CT machine. Dose affecting parameters - kV and mAs – were changed every time. Scan length was 8,5 cm and it consisted of 86 images. CT dose index (CTDIvol) for each scan differed 4,1 – 17,2 mGy). For every scan, 4 reconstructions were made using iterative reconstruction algorithms (Philips iDose, from level 1 to 4), for the bone windows. To estimate the quality of reconstruction series, one radiologist performed 15 measurements of radiodensity and image noise in 3 slices of every reconstructed series. Measurements were made in a circle-shaped region of interest (100 mm<sup>2</sup>, ± 5 mm<sup>2</sup>) in the air 1-4 mm from the body surface. The median density and noise values, as well as the corresponding signal-to-noise ratio (SNR) were calculated to estimate the most optimal IR technique providing the best image. Both image quality and dose (CTDIvol, in mGy) used in examination were taken into account to determine the best IR technique for use in practice.

**Results:** Altogether 20 reconstructions were obtained and 300 radiodensity and noise measurements were made. From 2nd to 4th scan, as the CTDIvol was growing, noise levels decreased, until CTDIvol was above 12,8 mGy and noise levels started to increase. Within the same CTDIvol, iDose 3 compared to iDose 2 and it compared to iDose 1 provided either the same or better SNR. However iDose 4 compared to iDose 3 in 3 out of 5 scans showed even more noise than previous IR technique level. The lowest noise value (SD=38) as well as the best SNR (32,3) was acquired using IR technique iDose 3, when CTDIvol was 12,8 mGy.

**Conclusions:** In paranasal CT examination, within comparable image quality levels, no IR technique for bone window provides significantly less image noise than any other. Image quality is closely related to the dose used for examination.

## **ECG-gated computed tomography as a tool in detecting abnormalities of cardiac pacing systems – analysis**

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**Tutor:** Prof. Elżbieta Czekajska-Chehab, Prof. Piotr Machowicz

**Introduction:** In recent decades, cardiac pacing has become a common method of treating symptomatic disorders of automatism and atrioventricular conduction in the myocardium. Cardiac computed tomography (CT) with high spatial resolution, volumetric acquisition and multiplanar image reformatability is considered the gold standard imaging method for the study of pacing systems. Moreover, it enables the assessment of the position and course of the older generation of stimulating systems, in which, due to the generation of a strong electromagnetic field, magnetic resonance imaging is contraindicated.

**Aim of the study:** The aim of the study was to present the possibilities of ECG-gated CT in detecting abnormalities in the course and position of cardiac pacing systems.

**Material and methods:** The results of ECG-gated CT of the heart of 141 patients (71 women, 70 men, mean age  $67.4 \pm 13.5$ ) with the presence of loops on the course of the electrodes of the cardiac pacing systems, abnormalities in the position and fixation of the electrodes in the lumen of the heart cavities, and the position of the electrodes outside the heart cavities, examined at the 1st Department of Medical Radiology of the Medical University of Lublin in the period 2002-2021 were analyzed.

**Results:** Loops on the electrode course were found in 59 patients. Position abnormalities were detected – position in the superior vena cava in 33 cases, in the inferior vena cava in 5, in pulmonary trunk or pulmonary artery in 2, and in the lung in 1. Within the heart cavities, position in the right atrium was found in 14 patients, in the right ventricle in 50, and in the left ventricle in 4 subjects.

**Conclusions:** Cardiac CT imaging with ECG gating is a useful tool for the assessment of electrode positioning and detection of possible abnormalities in their course, characterized by high sensitivity and unambiguous interpretation of the test.

## SURGERY AND TRANSPLANTOLOGY

**COORDINATORS:** Magda Barańska, Magdalena Kowalczyk

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## **Correlation of tumor markers in peritoneal fluid and blood serum in patients with colorectal cancer.**

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**Introduction:** Tumor markers detected in blood serum are routinely used to diagnose and monitor various neoplastic diseases. However, their sensibility and specificity is often insufficient. This problem prompts the search for more reliable and indefectible methods of detecting tumor markers, e.g. by sampling them from the peritoneal fluid during surgery.

**Aim of the study:** The aim of the study was to investigate whether selective tumor markers measured in the peritoneal fluid have a greater diagnostic value than those obtained from serum. An additional goal was to evaluate the dynamics of markers decrease three days after tumor removal.

**Material and Methods:** Between April 2019 and March 2020 samples of peritoneal fluid and blood serum were collected from 20 patients with colorectal cancer (CRC) in the stages II to IV. The peritoneal fluid was collected firstly, during the operation and secondly, three days later from the surgical drains. The blood serum was drawn just before the operation and subsequently three days later. The levels of carcinoembryonic antigen (CEA), Ca-125, Ca19.9, lactate dehydrogenase (LDH) and alpha-fetoprotein (AFP) were determined in all samples and compared. Statistical data analysis was performed with Statistica.

**Results:** The levels of Ca125 and LDH at the day of operation were significantly higher in peritoneal fluid than in the blood serum ( $p=0,0012$ ,  $p=0,0268$ ), whereas the level of AFP was higher in blood serum ( $p=0,0001$ ). Three days after the operation, the levels of Ca125 and LDH in peritoneal fluid remained significantly higher ( $p=0,0007$ ,  $p=0,0153$ ), while AFP levels became comparable in both the peritoneal fluid and blood serum. There was no statistically substantial decrease in the level of the tumor markers in the peritoneal fluid after three days. Out of all the measured tumor markers obtained from the blood serum, only the AFP level decrease after three days has been proven to be of statistical significance ( $p=0,0170$ ).

**Conclusions:** Quantitative determination of Ca125 and LDH levels in the peritoneal fluid is more accurate as compared to the determination in the blood serum both on the day of surgery and 3 days later, while the determination of AFP is more accurate in blood. However, in the subsequent studies, the impact of the operation (e.g. tissue traumatization) on the level of the markers should be excluded.

## Differences in iron and magnesium blood concentrations as the aftermath of laparoscopic sleeve gastrectomy (LSG)

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**Introduction:** Laparoscopic sleeve gastrectomy (LSG) is an instance of the fundamental procedure used in treating obesity. Countless, beneficial outcomes of this treatment such as weight loss, systemic parameters improvement and enhancing comfort of life determine its efficacy. However, there are some disadvantages of this method which are manifested in microelements deficiency.

**Aim of the study:** The aim of the study was to investigate differences in iron and magnesium blood concentrations after LSG and to evaluate minerals supplementation efficacy.

**Material and methods:** The retrospective medical history analysis of 153 patients who underwent LSG between 2014-2017. The blood tests of iron and magnesium were collected 1,3,6,12 months postoperatively. The supplementation of microelements was incorporated in case of their deficiencies.

**Results:** The study group consisted of 80 women (52.29%) and 73 men (47.71%). The mean age was  $46 \pm 10.55$  years. Mean BMI before the surgery was  $45.44 \pm 7.34$  kg/m<sup>2</sup>. One month after the surgery 7 patients (5.11%) presented iron deficiency-mean iron blood concentration was  $81.28 \pm 24.33$  µg/dL. Due to supplementation iron mean serum concentration elevated to  $99.06 \pm 37.83$  µg/dL after 1 year. The iron scarcity was shown in 4 patients. One month after the surgery magnesium mean blood concentration was  $0.84 \pm 0.09$ . The magnesium deficiency was found in 43 patients (31.39%). Those patients had supplementation included. After 12 months magnesium mean serum concentration increased to  $0.86 \pm 0.07$  and only 15 patients presented its value below expected level.

**Conclusions:** Mineral supplementation after laparoscopic sleeve gastrectomy is crucial to sustain optimal minerals levels and to avoid the consequences of their deficiency.

## **If computed tomography angiography can diagnose Median Arcuate Ligament Syndrome?**

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**Tutor:** Bohdan Solonynko MD. PhD

**Introduction:** Median arcuate ligament syndrome (MALS) is a rare clinical condition caused by the celiac trunk and celiac plexus compression by median arcuate ligament. In some real cases, it may cause additional symptoms from the nervous system, such as loss of consciousness, arrhythmia and abdominal pain as well as ischemic complications: ischemic gastritis and ischemic pancreatitis. However, not all patients with celiac trunk compression diagnosed in computed tomography and angiography (CTA) scans may develop clinical symptoms.

**Aim of the study:** was to check the occurrence of celiac trunk compression and the incidence of specific symptoms of MALS.

**Material and method:** The anatomy of the celiac trunk was analyzed in CTA of 300 consecutive patients, diagnosed in the Department of General, Vascular and Transplantation Surgery. Due to medical reports data, patients with celiac trunk compression were divided into two groups: symptomatic (A) and asymptomatic (B). The multifactorial analysis was performed in both groups for symptoms causally related to celiac trunk compression. Information was collected on age at the first onset, gender and reported symptoms. Patients were diagnosed for arrhythmias, abdominal pain, and loss of consciousness.

**Results:** The radiological signs of celiac trunk compression in CTA were found in 43 of 300 patients (14%). The compression caused stenosis in 38 patients (88%) and occlusion in 5 patients (12%). Due to the medical data reports, 6 of 43 (14%) patients had specific symptoms of MALS (group A). The rest 37 of 43 (86%) were asymptomatic (group B). All 5 patients with celiac trunk occlusion were asymptomatic. The multifactorial analysis of medical data performed in both group showed be higher incidence of MALS in younger patients with early onset of clinical symptoms.

**Conclusions:** The celiac trunk compression is usually asymptomatic in the majority of patients. The diagnosis of MALS should depend on specific symptoms as well as CTA. The higher incidence of MALS is associated with younger age and earlier onset of specific symptoms.

## THE IMPACT OF OPEN INGUINAL HERNIA MESH REPAIR ON QUALITY OF LIFE

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**Aim of the study:** is study aims to evaluate the effect of open inguinal hernia repair with mesh on the quality of life of the patients who were operated at a university hospital.

**Material and methods:** In this cohort study, 86 patients who had undergone an open inguinal hernia repair at General Surgery Department in a university hospital between January 2017 and October 2019 were asked to fill out the Carolinas Comfort Scale questionnaire and the data were analyzed retrospectively.

**Results:** The total number of patients in the study was 86. Seventy-three were male (84%) and 13 were female (16%). The median age was 53 years ranging from 18 to 82. The difference of pre- and post-operative scores revealed high significance in all categories and in total; laying down, bending over, sitting up, performing activities of daily life, coughing or deep breathing, walking or standing, walking up or down the stairs, exercising and total score.

**Conclusion:** Inguinal hernia decreases the quality of daily life by limiting the movements with groin pain. Surgical low-tension repair with mesh improves the quality of life significantly. Keywords: Inguinal hernia, quality of life, mesh repair,

## The comparison of surgical treatment results of cholecystolithiasis between young and elderly populations

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**Introduction:** Laparoscopic cholecystectomy is one of the most frequently performed procedures in general surgery. According to data from the USA, only in this country this procedure is performed 500 000 times annually. Commonness of this method of treatment yields that an absolute number of complications is high and due to that some research institutes claim that we overuse that procedure and perform it without explicit indications. So, is it worth to apply the conservative treatment in patients with cholecystolithiasis?

**Aim of the study:** was to compare the results of surgical treatment of cholecystolithiasis in the population of young people to results in population of elderly people. Thanks to this, we attempt to answer the question whether it is more favourably to treat patients with early diagnosed cholecystolithiasis or to wait for symptoms and perform surgery in older age.

**Material and methods:** We retrospectively analyzed the 538 patients admitted in years 2014-2020 for elective or acute cholecystectomy at the General Surgery and Multiorgan Trauma Clinic of the University Hospital in Krakow. Our group included patients under 35 years old (group A) and patients over 65 years old (group B). We compared: gender distribution, admission mode (emergency or elective), general condition according to the ASA scale, severity of the disease on the APACHE 2 scale, mean hospitalization time and mean duration of the surgery, conversion rate, open cholecystectomies, postoperative complications and hospitalization in ICU and death rate. The material was collected in the Excel spreadsheets, statistical research was conducted using the t-student and chi-square tests.

**Results:** We qualified 85 patients for Group A and 155 patients for Group B. We observed, that patients included in the Group B were significantly more often admitted in acute mode ( $n=92, 59,4\%$  vs  $n=30, 35,5\%$ ), their mean duration of stay ( $119,4h$  vs  $57,8h$ ) and mean operation time ( $93,6min$  vs  $77,25min$ ) were longer. Conversions were observed more often in group B ( $n=16, 10,3\%$  vs  $n=1, 1,2\%$ ), so were complications ( $n=29, 18,7\%$  vs  $n=8, 9,4\%$ ). In group A neither ICU stays nor deaths were not reported, while in group B there were 11 and 8 cases, respectively. In all considered parameters we have shown the statistical significance ( $p<0,02$ ) between both groups.

**Conclusions** 1. It was found that the elderly patients (group B) are hospitalized significantly longer, more often admitted in the emergency mode, and the mean time of procedures they undergo is longer. 2. Surgical treatment of cholecystolithiasis in older age is associated with a higher risk of conversion, complications are more frequent as well as the necessity of staying in the ICU. The percentage of deaths is also noticeably higher. 3. The general conclusion: it is better to operate on young patients than to postpone the procedure until symptoms appear, because performing cholecystectomy in old age is associated with a higher peri- and postoperative risks.



## **Prognostic value of novel serological markers in predicting postoperative complications of ileocecal resection in Crohn's disease patients**

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**Introduction:** Nearly 50% of patients with Crohn's disease (CD) undergo surgery in the first 10 years of course of the disease. Some of these procedures are burdened with risk of serious postoperative complications, thus it is important to predict possible outcomes of surgery. Research of current literature revealed, that studies give special attention to estimate significance of easily available blood markers (i.e., neutrophil-to-lymphocyte ratio, platelets-to-lymphocyte) in diagnosis and monitoring of Crohn's disease. Therefore, in this study we examine clinical significance of neutrophil-to-lymphocyte ratio (PLR), platelets-to-lymphocyte ratio (NLR), mean platelet volume (MPV) and C-reactive protein (CRP) in predicting possible postoperative complications.

**Aim of study:** To determine if NLR, PLR, MPV and CRP, which are markers easily obtained from complete blood count, can be used as a prognostic marker in predicting complications of ileocecal resections performed in CD patients.

**Material and methods:** A retrospective analysis of medical records from 2008-2019, was performed. The study group consisted of 122 patients (including 57 female and 65 male) with Crohn's disease exacerbation who underwent ileocecal resection or subtotal colectomy in the Department of General and Colorectal Surgery at the Medical University of Lodz. Patient data were analyzed for age, gender, complete blood count at the time of admission to the ward as well as postoperative complications. Severity of the complications was assessed using the Comprehensive Complication Index (CCI). Data analysis was carried out with the STATISTICA software.

**Results:** 50 patients developed any complication in the peri- or postoperative course. The CRP and MPV levels were significantly higher (respectively  $73,62 \pm 72,12$  vs.  $27,74 \pm 50,7$ ,  $p=0,003$ ;  $10,31 \pm 1,03$  vs.  $9,58 \pm 1,04$ ,  $p<0,001$ ) in the group of patients with complications. The NLR and PLR levels were also higher but without statistical significance (respectively  $7,08 \pm 6,2$  vs.  $6,01 \pm 5,21$ ,  $p=0,318$ ;  $340,22 \pm 236,46$  vs.  $318,96 \pm 182,63$ ,  $p=0,577$ ). Moreover CRP and MPV were positively with the CCI score (respectively  $r=0,367$  and  $r=0,412$ )

**Conclusions:** Our analysis revealed that, CRP and MPV level are significant in predicting possible postoperative complications of ileocecal resection performed in patients with Crohn's disease. These parameters should be taken into consideration, when surgical procedures are scheduled.

## **Risk factors of postoperative complications after surgery in Leśniowski-Crohn's disease: A meta-analysis**

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**Presenting author:** Joanna Łosińska

**Tutor:** Prof. Michał Mik

**Introduction:** Leśniowski-Crohn's disease is a chronic progressive inflammatory granulomatous disease that can involve any part of the gastrointestinal tract. Nearly 70–90% of patients will undergo at least one operation during the course of Leśniowski-Crohn's disease. The incidence of postoperative complications is higher after surgery for Leśniowski-Crohn's disease than after other surgeries. Proper identification and intervention can significantly limit the adverse consequences and possibly improve outcomes.

**Aim of the study:** The aim of this study was to assess the risk factors of postoperative complications in Leśniowski-Crohn's disease patients undergoing abdominal surgery.

**Material and Methods:** The PubMed database was searched to identify observational studies reporting the risk factors for postsurgical complications in Leśniowski-Crohn's disease patients. A meta-analysis was conducted to investigate the impact of various risk factors.

**Results:** This review included 26 studies evaluating 11500 patients undergoing 12134 operations. The meta-analyses found that preoperative low albumin levels (odds ratio [OR]:2,32; 95% confidence interval [CI]:1,80-2,99), elevated CRP levels (OR: 2,70; 95% CI: 1,59-4,57), anaemia (OR:1,52; 95% CI:1,01-2,27); elevated WBC count (OR:2,09; 95% CI:1,03-4,26), low BMI (OR: 3,24; 95% CI: 1,54-6,82), preoperative steroids use (OR: 1,75; 95% CI:1,40-2,18), preoperative biologics therapy (OR: 1,50; 95% CI:1,14-1,98), previous surgical history (OR:1,57; 95% CI:1,32-1,85) may be risk factors for postoperative complications. There were no associations between patient's age at the time of surgery, gender, cigarette use, a preoperative abscess, immunomodulator therapy with the risk of postoperative complications.

**Conclusions:** Knowledge about risk factors like serum albumin, CRP, hemoglobin and WBC levels, as well as BMI, medications, previous surgical history may influence treatment decisions, and possibly may reduce the postoperative complication rate.

## **The use of Videoautopsy in a post-mortem examination,**

Szymon Rzepczyk

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**Introduction:** An autopsy consists in opening body cavities and assessing each organ. A few years ago, tomographic methods were used in post-mortem analyses in order to facilitate the performance of a classic autopsy and help to determine the cause of death (Virtopsy). Endoscopy will complement tomographic methods in post-mortem examinations (Videoautopsy). Videoautopsy is a method of minimal invasiveness, therefore, its implementation will undoubtedly reduce the disfigurement of a corpse. This new method will be especially important if, as an alternative, it is possible to leave the traditional method behind completely. Videoautopsy, an examination of the organs of the chest and abdominal cavity using endoscopic techniques, is a brand new way of performing a post-mortem examination. In this work, we present the first attempts to use the new endoscopic method in autopsies in Poland.

**Aim of the study:** The objective is to showcase the use of the endoscopy, which its authors named Videoautopsy, in post-mortem examinations. This technique will be an excellent complementation to Virtopsy, which in the future may completely replace the traditional autopsy.

**Material and methods:** In the period from April 2020 to February 2021 at the Chair and Department of Forensic Medicine of Poznań University of Medical Sciences, 10 post-mortem examinations were carried out with the use of endoscopy (Videoautopsy). They were performed using a column and an optical system Storz (Telecam SL II, Xenon Nova 300, Storz Thermoflator, Germany) and Mölnlycke laparoscopic surgical instruments (Sweden).

**Results:** The procedures proved Videoautopsy to be a feasible and useful method in post-mortem diagnostics. Endoscopic examination of abdominal cavity and chest allowed for the accurate detection and evaluation of macroscopic changes in organs, while causing minimal damage and disfigurement to the corpse. Openings made to insert trocars were small and easy to conceal. The whole procedure could have been recorded.

**Conclusions:** This minimally invasive endoscopic method of examining the chest and abdominal cavity organs may, one day, become an alternative procedure to the traditional autopsy. Videoautopsy can also be utilized for educational purposes, to instruct surgeons. The method would be a complement to the tomographic one (Virtopsy), which would significantly expand the diagnostic possibilities. It is necessary to develop a technique of endoscopic examination of the skull and brain cavities. Research carried out at the Chair and Department of Forensic Medicine of Poznań University of Medical Sciences also aims at developing a set program for conducting a post-mortem examination, as well as showcasing its limitations.

## **Pancreatic surgery - a complex interdisciplinary problem**

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This paper presents the complexity of pancreatic surgery as an interdisciplinary problem. It is a brief compilation of recent findings and well-known methods in this area. The article is based mostly on American Cancer Society, American Gastroenterological Association and Endocrine Society guidelines. The pancreas is one of the most important organs in the human body. It regulates blood glucose levels, secretes hormones and produces digestive enzymes which break down carbohydrates, proteins and fats. In recent years, the number of gastroenterological patients with pancreatic problems (particularly cancers) has been increasing. Surgical removal of the pancreas, which also involves the removal of surrounding tissues, plays a key role in the cancer treatment process. The difficulty of the procedure is related to the location of the pancreas and the anatomical proximity of important organs and structures. Therefore, the surgery can result in a dysfunction of not only the pancreas itself, but also of the nearby organs and tissues. The most common complications of complete or partial pancreatectomy include deficiencies in endocrine or exocrine pancreatic function. The surgery, preoperative patient preparation and postoperative care are not just a surgical challenge, as they require cooperation of many specialists. It is a high-risk procedure with many possible complications. As an important endocrine and exocrine organ, the pancreatic surgery is a surgical, endocrine and gastroenterological problem.

UROLOGY

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## **Renal injuries in trauma center.**

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**Introduction:** Injuries are the third leading cause of death across all ages [1]. In both, adult and children cohorts, urogenital trauma has a cumulative incidence of 10-20%, and the kidney is involved in 65–90% of the time [2]. Renal trauma is often a part of polytrauma. Although these injuries are seldom life - threatening and non - operative methods are preferred (except high grade renal injury), their early diagnosis and management can prevent hemodynamic instability and loss of organ function.

**The aim of the study:** The aim of this study was the multifactorial analysis of cases of renal traumas.

**Methods and material:** The analysis includes data on the management of 33 patients (men = 30, women = 3) in the Clinical Urology Department in Trauma Center in Sosnowiec in the period between 2010 and 2020.

**Results:** The most common mechanism of renal trauma was blunt trauma, noticed in 82 % of all cases. The mean age of patients was 46 years  $\pm$  20. Non - operative treatment was conducted in 9 cases. 24 patients needed surgery. The severity of injuries was estimated according to AAST scale and the following distribution was noted: grade I = 9, grade II=4, grade III = 5, grade IV =12 and grade V = 3. In 18 cases renal trauma was a part of polytrauma. The most common injuries coexisting with renal trauma were bones fractures (n= 12, in which more often ribs fractures n = 10), pneumothorax (n = 6), lungs contusion (n=5), spleen trauma (n=5) and liver trauma (n=5). None of the patients died due to renal trauma in our study.

**Conclusions:** The management of renal trauma based on a proper diagnosis and best way of treatment is very important for saving patients' health and for maintaining a good quality of life after trauma. It depends on many factors. The most important of them are the medical team (that consists of well-educated and cooperating health care workers), a proper management of life - threatening injuries and then appropriate treatment by urologists.

## **Defects of the testicle, epididymis and vas deferens in boys with cryptorchidism.**

Maciej Nowak

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**Tutor:** Prof. Jerzy Niedzielski

**Introduction:** Cryptorchidism(undescended testis – UDT) is a condition in which one or both testes are absent from the scrotum, having failed to descend into the scrotum before birth. It is one of the most common urogenital malformations in children. Anatomical defects of the gonad are considered to be one of the causes of cryptorchidism in boys. Defects may concern the testicle, epididymis and vas deferens.

**Aim of the study:** The aim of the study was to investigate the frequency of abnormalities of the testicle, epididymis and vas deferens in the group of boys operated on for cryptorchidism and to compare the results with the incidence of these defects in boys operated on for communicating hydrocele.

**Material and methods:** 408 boys operated on for cryptorchidism at the Department of Pediatric Surgery and Urology of Medical University of Łódź in the period from January 2011 to December 2017 were subjected to a retrospective analysis. Orchidopexy was performed in 209(51,2%)boys on the right side, in 158 (38,7%) on the left side and in 41(10%) boys bilaterally. During the operation, after opening fascia, surgeons assessed the structure of the testicle, epididymis and vas deferens as well as the continuity of connections between them. The detected anomalies were classified based on uniform criteria adopted by the authors.

**Results:** 226 testicular defects were found in 210(51.4%) UDT patients and were classified as major(defects that could impair patient's future fertility) and minor(the ones not influencing future fertility). Defects concerned testis were found in 34(15%) cases, epididymis in 94(41,6%) and vas deferens in 16(7%)boys. 82 (20%) patients had appendix testis or epididymis, which were removed during surgery. The 68 major defects were observed in 64(15.6%) boys while 164 minor anomalies were found in 146(35.7%) patients. In 192 patients one defect only, in 14 patients two defects and in 4 patients three defects were found. In the reference group of 249 patients operated on for communicating hydrocele 134 defects were observed in 125(50.2%) patients - 5(2%) major and 129(48.1%) minor. The incidence of both major and minor defects(excluding appendix testis) was significantly higher in the UDT group in comparison to reference group(major 15% vs 2%, minor 20% vs 11.2%)

**Conclusions:** Meticulous inspection of the gonad in order to detect possible anatomical abnormalities should be obligatory during each orchidopexy in boys with cryptorchidism. Both major and minor defects incidence was higher in the UDT boys comparing with reference group, what indicates their close relationship with the process of testicular descent (as a cause or as a result).

## **Community awareness about UTI and why people do not visit the urologist?**

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**Introduction:** Urinary tract infection (UTI) is one of the most common bacterial infections, and the incidence in women is much higher than in men. The diagnosis of UTI can be made based on a combination of symptoms such as (dysuria, cloudy or bloody urine, pelvic pressure and lower abdominal discomfort) and a positive urinalysis or culture, UTI accounted for nearly 7 million office visits and 1 million emergency department visits, resulting in 100,000 hospitalizations.

**Aim of this study:** to compare the awareness of Saudi society with that of other societies about UTI and to identify the reasons why people complaining of UTI do not visit a urologist and to compare it with other complaints such as (lower back pain, chest pain, shortness of breath...).

**Results:** This meta-analysis study was based on data collected using a questionnaire created in a Google document. The data were analyzed using statistical software in Microsoft Windows. The studied sample which is aged between 18 and above 45-year-old, consisted of a randomly selected group of 200 Saudi and Non-Saudi males and females, equally divided. In addition, the study investigates the effect of gender, age, sexual activity and other factors on the level of awareness of urinary tract infections. The study explores how Saudi society obtain medical information, recognize symptoms of UTI, and consult a urologist compared to other specialists, as well as their awareness of common prevention methods for urinary tract infections.

**Conclusions:** the level of awareness in both societies is crucial, most people know what is UTI, but they have no idea of the symptoms associated with it . The study shows that the most common reason why people who complain of UTI usually do not go to the urologist is that they do not feel the need for it, followed by shyness. Almost half of people go to the doctor when they have other complaints, such as chest pain, while about 75% of people do not go to the urologist.



## The prevalence of vitamins deficiency among dialysis patients

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**Tutor:** MD PhD Laurynas Rimševičius

**Introduction:** Normally, people obtain adequate amounts of nutrients by eating a wide range of natural foods. However, many dialysis patients find it difficult to obtain enough of certain vitamins to stay healthy as they must follow dietary restrictions and many vitamins are lost during dialysis. That's why they are at risk for vitamin deficiencies. It can be stated that many dialysis patients present hypovitaminosis. It is necessary to follow up and when deficiency is detected, prescribe the missing vitamin to maintain a normal health status.

**Aim of the study:** The purpose is to investigate the prevalence of vitamin deficiencies among patients on peritoneal dialysis (PD).

**Material and methods:** A retrospective analysis was conducted where the medical data of 146 patients who were treated with PD was analyzed. Medical data was generated from the Hospital Information system and was processed in IBM's SPSS Statistics 21.0 software. The significance level was 0.05.

**Results:** The research sample consists of 146 patients: 57.5% of men and 42.5% of women. A lot of patients were in the age groups of 50-59 and 60-69 years with percentages of 24.0% and 22.6% respectively. Unfortunately, 25(OH) D levels were measured in only 48% of these patients. 82.9% of them were found deficient and the mean 25(OH) D level was 48.52 nmol/l. Cobalamin was measured in 40.4% of patients and 6.8% of them were found to be deficient in. The mean vitamin B12 level among cases was 306.53 pmol/l. Folate was measured in 45.2% of patients, 18.2% of whom were found deficient and the mean level was 19.45 nmol/l. When comparing patients with and without folate deficiency, a significant difference in age was observed: respectively 48.4 and 50.5 years. No other vitamin levels were studied in patients on PD. Only 30.8% of patients were tested for all mentioned vitamins. A statistically significant difference was detected for the mean folate level when divided into two groups, those aged less than 50 years and above 50 years: respectively 22.39 and 15.05 nmol/l. By dividing the patients into groups with and without vitamin D deficiency, a significant age difference was observed: respectively 50.7 and 44.6 years similar to cobalamin, where a significant difference was observed by comparing the male/female ratio: 25/75% and 45.3/53.7%.

**Conclusion:** Many dialysis patients present hypovitaminosis, so it is important to follow up on the amounts of vitamins that are most commonly missing. Patients on PD in Santaros klinikos usually have only three tests of vitamin levels to assess their deficiencies – they are D, B9 and B12. Only a third of these patients had tests of all mentioned vitamins. The data evaluation allowed to observe that more than 80% of patients had the hypovitaminosis D, the prevalence of patients with vitamin D and folate deficiencies was highest in the elderly and cobalamin deficiency was more common in women.

## **Can we predict urosepsis in patients treated for nephrolithiasis? Risk factor analysis.**

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**Introduction:** Ureterolithotripsy is an approved low-invasive method of nephrolithiasis treatment. As the procedure does not require breaking the anatomical barriers of the urinary system, it is considered to be relatively easy to conduct and entails a low risk of complications. However, some patients develop urinary tract infection in the postoperative period, which may eventually lead to the development of urosepsis. In rare cases, this complication may be fatal, especially in the case of delayed treatment, antibiotic therapy and adequate drainage of the urinary tract. There is a lack of data involving prognostic factors of infectious complications after an undergone ureterolithotripsy. Acquiring knowledge of them would allow to identify patients with high risk of developing urosepsis, enabling the early implementation of effective treatment.

**Aim of the study:** To determine the frequency of occurrence and identify risk factors for urosepsis in the postoperative period in patients undergoing ureterolithotripsy.

**Material and methods:** The research was conducted on a group of 231 patients who underwent ureterolithotripsy due to nephrolithiasis in the Clinic of Urology and Urological Oncology in Szczecin in 2020. Each intervention was performed using a holmium laser. The risk of urosepsis occurrence during a 30-day post-treatment period was analyzed. In addition, the relationship of potential factors influencing urosepsis occurrence in postoperative course was evaluated. The analysis took into account: age, sex, body mass index, coexisting arterial hypertension and diabetes, lateralization, maximum concretion dimension and density, presence of hydronephrosis, coexisting infections of urinary tract based on urine culture results, duration of the procedure, thoroughness of lithotripsy and previous urinary tract instrumentalization. The risk factors' analysis was performed using multinominal logistic regression. Value of  $p < 0.05$  was considered statistically significant. All calculations were performed with the Statistica 13 software.

**Results:** The mean age of the patients was 56.41 SD 13.72 years. The analyzed population was dominated by men (60.17%). 16.45% of patients had an urinary tract infection confirmed before the procedure. Urosepsis after the procedure was detected in 4.76% of the patients. The multivariable analysis showed that only two variables substantially increased the risk of urosepsis after the interventional treatment: previous urinary tract instrumentalization and positive urine culture result. The odds ratio was accordingly 3.597 95%CI (1.02-12.686),  $p=0.047$  and 4.559 95%CI (1.317-15.783),  $p=0.017$ .

**Conclusions:** Patients with prior urinary tract instrumentalization due to nephrolithiasis and positive result of urine culture before the ureterolithotripsy are at substantial risk of urosepsis in the postoperative period. Urine culture should be performed routinely for each patient before the planned endoscopic nephrolithiasis treatment.

## **Does COVID-19 pandemic restrict the access to emergency urological health services? Assessment of the effectiveness of reorganization of hospital treatment.**

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**Introduction:** Renal colic caused by urolithiasis is one of the most common acute urological conditions. Treated properly, the disease usually runs without complications, but if delayed urolithiasis may lead to severe infections and renal failure. Therefore, it is essential to administer appropriate treatment as early as possible. The restrictions caused by the SARS-CoV-2 coronavirus pandemic and the burden on the healthcare system caused by the treatment of patients with severe acute respiratory syndrome SARS-CoV-2, could significantly contribute to delaying the treatment of all patients, including those with urolithiasis. Moreover, changes in the organization of the health care system may significantly extend the time from the onset of first symptoms to providing medical care in urgent conditions.

**Aim of the study:** The influence of COVID-19 pandemic on course and treatment of acute episodes of urolithiasis.

**Material and methods:** Retrospective analysis of patients treated in Department of Urology and Urological Oncology due to an acute episode of urolithiasis during the peak of infections (October-December 2020) caused by the COVID-19 pandemic. The analysed group was compared with patients treated in analogical period in 2019. Analysis included: age, sex, duration of symptoms, BMI, coexistence of diabetes and hypertension, parameters of inflammation, creatinine concentration and GFR, individual parameters of the urinalysis, urine and blood cultures, antibiotic therapy, type of intervention and hospitalization time. Additionally, variables related to the presence of deposits, such as the size, location and density of deposits, the degree of hydronephrosis, the density of the ureter above the deposit were analysed. A p-value < 0.05 was considered statistically significant. All calculations were performed with the Statistica software.

**Results:** The number of patients requiring hospitalization due to an acute episode of renal colic did not differ significantly between the analysed time intervals and amounted to 67 patients in 2019 and 62 patients in the COVID-19 pandemic. The gender distribution and average age were also similar (respectively 53.87 years in 2019 vs 53.13 years in 2020,  $p > 0.05$ ). The percentage of women was respectively 38.8% and 35.5% ( $p > 0.05$ ). No differences between the other analysed variables related to patient characteristics, including the concentration of renal parameters and inflammation were observed. The size, position and density of the deposits, the degree of hydronephrosis, and the density of the ureter above the deposit were also comparable between the patients treated.

**Conclusions:** Reorganization of hospital treatment forced by the increased burden on the health care system during the COVID-19 pandemic enabled effective treatment of patients with the acute episode of renal colic during the peak of SARS-Cov-2 infections. COVID-19 pandemic had no significant impact on treatment of urgent patients with urolithiasis.

## **Study on vitamin D3 and methylprednisolone potential in modulation of podocalyxin expression in podocyte cell line in vitro model of minimal change disease**

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**Tutor:** MD PhD Kamil Grubczak

**Introduction:** Minimal change disease (MCD) is considered one of the most significant causes of the nephrotic syndrome - a kidney disease with critical glomerular filtration barrier dysfunction, which leads eventually to an increased renal membrane permeability and proteinuria. Podocytes foot processes, whose structure is pathologically transformed in MCD, are a crucial part of the barrier. In addition, podocalyxin is a protein component involved in their formation, thus, disturbances in its structure can initiate development of minimal change disease. Although recent reports indicate unfavorable involvement of podocalyxin defects in glomeruli function, the mechanism through which therapeutically used steroids could regulate its level and consequently affect podocytes is still unknown.

**Aim of the study:** The aim of our project was to evaluate podocalyxin expression within podocytes cell line subjected to induction of minimal change disease in vitro model. Moreover, the influence of steroids and another immunomodulator - vitamin D3, on podocalyxin levels was assessed.

**Methods:** To induce selective cell damage to reflect the morphology of podocytes in MCD, the podocyte cell line (CIHP-1; University of Bristol) was incubated with LPS+PAN. Subsequently, podocytes were supplemented with different concentrations of vitamin D3 (VIT.D3) and methylprednisolone (MP). Podocalyxin expression was measured on protein and mRNA level using flow cytometry and RT-PCR.

**Results:** At first, we established that the podocalyxin expression on the mRNA level was significantly higher in LPS+PAN-stimulated podocytes. In reference to drugs tested, high concentrations of VIT.D3 resulted in decreased expression of podocalyxin on an mRNA level. Interestingly, the frequency of podocytes expressing podocalyxin protein was lower in the MCD model podocytes. High concentrations of VIT.D3 led to a further decline in percentage of podocytes expressing podocalyxin.

**Conclusions:** Our study demonstrated that minimal change disease and related morphology disturbances within podocytes might be associated with alterations in podocalyxin expression. Moreover, we found significant influence of vitamin D3 on modulation of that protein expression. Further studies are required for comprehensive assessment of podocalyxin in MCD and mechanism of its response to vitamin D3.

## **Influence of pelvic floor muscles on urinary incontinence among women.**

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**Tutor:** M.Sc. PhD Katarzyna Wszółek

**Introduction:** Incontinence consists in the uncontrolled urine leakage from the bladder, regardless of the cause. Every woman should take care of the condition of her pelvic floor muscles to prevent the occurrence of incontinence.

**Aim of the study:** Evaluation of the knowledge among women about the pelvic floor muscles and their influence on incontinence incidents.

**Materials and methods:** The study was based on the evaluation of the responses received to the online and paper questionnaires. Our questionnaire collected information on the prevalence of urinary incontinence among women and their knowledge of pelvic floor muscles. The study surveyed among 419 women (46 paper and 373 full-filled online questionnaires).

**Results:** A survey was conducted among women aged 19-70 and indicated that 34.1% respondents struggled with urinary incontinence (almost 46% while coughing, sneezing, exercising, lifting heavy objects or laughing). Surprisingly only 18.1% of women went to the doctor for a consultation due to the problem. Childbirth was undoubtedly a factor affecting the functioning of the pelvic floor muscles. 46.8% of women who gave birth, incidents of urinary incontinence occur. The knowledge among women is still not sufficient. Although 76.4% of the respondents said they knew where the pelvic floor muscles were, but more than 25.3% of them were wrong about its location. As many as 52% of the respondents were still convinced that it was appropriate to exercise the pelvic floor muscles by stopping the flow of urine.

**Conclusions:** Despite the high percentage of women with incontinence incidents, knowledge of pelvic floor muscles is still insufficient. Among women which gave birth, incontinence incidents are more frequent than among women which did not give birth. It is concern that a large percentage of respondents believe that pelvic floor muscles should be trained during urination (by stopping the urine stream). The results indicate that educational programmes for women on pelvic floor muscles should be introduced.

## Asiatic Acid as a part of modern therapy in the treatment of overactive bladder

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**Tutor:** MD PhD Andrzej Wróbel, MD Andrzej Woźniak

**Introduction:** Overactive bladder (OAB) is described as a chronic condition characterized by urinary urgency, with or without urge incontinence, usually with frequency and nocturia. Pharmacological management of OAB is highly challenging due to a shortage of effective drugs. The treatment is based on administration of the anticholinergic agents. However, therapy with anticholinergic drugs is not successful in all patients and it is frequently associated with bothersome side effects such as: constipation, dry mouth, blurred vision, somnolence, confusion.

**Aim of the study:** Since the treatment options are scarce, scientists are constantly looking for new synthetic and natural compounds that could have beneficial effects in bladder overactivity. Thus, our particular attention was drawn by asiatic acid. It is one of the pentacyclic triterpenoids of *Centella asiatica* (so-called gotu kola), i.e. a medicinal herb belonging to the Apiaceae family.

**Material and methods:** The objective of the current exploratory research was to evaluate the effectiveness of asiatic acid in the animal model of retinyl acetate-induced detrusor overactivity. All experimental procedures were carried out on naive female Wistar rats. Asiatic acid was dissolved in 1% DMSO solution and it was administered by oral gavage for 14 days.

**Results:** The outcomes of our study showed that a 14-day administration of asiatic acid (30 mg/kg/day) by oral gavage normalizes the cystometric parameters corresponding to DO (detrusor overactivity) and reduces the accompanying oxidative stress. Moreover, it decreases the urinary secretion of neurotrophins and prevents the changes in a range of biomarkers indicating the dysfunction of the urinary bladder. The mentioned parameters are associated with smooth muscle contractions, urothelial barrier, transportation and release of transmitters, or bladder compensation.

**Conclusions:** Summarizing, the presented findings allow to suggest a possible future role of asiatic acid in the prevention of conditions accompanied by DO, such as overactive bladder. Multiple pre-clinical data and scarce clinical data encourage the notion that asiatic acid could have potential therapeutic value in the management of several chronic diseases (e.g., diabetes, epilepsy, hypertension, osteoporosis, Alzheimer disease, or cancer).