



**iMEDIC 2021 | Bydgoszcz**

**5<sup>th</sup> International Medical  
Interdisciplinary Congress**

**Medical, Pharmaceutical and Health Sciences**

**5<sup>th</sup> June | Bydgoszcz, Poland**

# **ABSTRACT BOOK**



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## 5<sup>th</sup> International Medical Interdisciplinary Congress

Medical, Pharmaceutical and Health Sciences

**5<sup>th</sup> June | Bydgoszcz, Poland**

### Editor:

Anna Ziółkowska



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## **Medicine Sciences Block**

### **Jury:**

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### **Moderator:**

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Jakub Husejko

Hanna Bednarek

Aleksandra Modlińska

Oliwia Jarosz



**Title:** The impact of Bevacizumab, Pazopanib, and KRN-633 on endothelial cells

**Authors:** Dominika Spyt, Klaudia Mikołajczyk, Wioletta Zielińska, Alina Grzanka, Maciej Gagat

**Session:** Medical Sciences Session I

#### Introduction:

The endothelium plays a significant role in the preservation of vascular homeostasis. It not only acts as a barrier between components circulating in the blood and tissues but is also important in the process of transmitting signals regulating vascular vasodilatation. Progressive endothelial dysfunction can contribute to disorders in the course of angiogenesis. The consequence of this can be the development of cardiovascular pathologies as well as the growth and development of tumors. The influence of angiogenesis inhibitors may increase the effectiveness of the therapy of these diseases.

#### Aim of the study:

The study was aimed to assess mechanisms of anti-angiogenic activity of Bevacizumab, Pazopanib, and KRN-633 in human primary endothelial cells and established endothelial cell line.

#### Material and methods:

The study was performed using commercially available (ATCC) primary human coronary artery endothelial cells (pHCAECs) and EA.hy926 cell line derived from the fusion of human umbilical vein endothelial cells with human lung adenocarcinoma cell line A549. The cells were treated with a solution of anti-angiogenic drugs: Bevacizumab, Pazopanib, and KRN-633 at various concentrations and incubated for 24 hours. Additionally, the inflammatory response of the cells pHCAECs and EA.hy926 was induced by a pro-inflammatory cytokine rhTNF- $\alpha$  in the concentration of 100 ng/ml. The antiangiogenic drug mechanisms were investigated using immunofluorescence labeling of the actin cytoskeleton and VE-cadherin. The immunofluorescence staining results were documented using a confocal microscope.

#### Results:

The study showed that rhTNF $\alpha$  activated expression of VE-cadherin. The pHCAECs cells showed less sensitivity to the anti-angiogenic drugs than the EA.hy926 cells. The influence of compounds on cells of pHCAECs induced structural changes within the actin cytoskeleton, the presence of entosis, and apoptotic body-like structures. Additionally, in EA.hy926 cells, the tested compounds led to the degradation of the actin cytoskeleton. Moreover, the inflammation induced in the cells of both lines intensified the effect of the compounds used in the study, which resulted in increased disintegration of the cytoskeleton of the cells. The effect of Pazopanib in combination with TNF- $\alpha$  led to the formation of vesicular structures along the course of the F-actin retraction fibers of migrating pHCAECs cells. While KRN-633 with TNF- $\alpha$  in these cells led to the translocation of VE-cadherin to the nucleus.

#### Conclusions:

The results of the study indicate that the angiogenesis-inhibiting drugs exert mainly antiproliferative effect in endothelial cells. What is more, immunofluorescence staining of F-actin and VE-cadherin showed that the reorganization of the cytoskeleton leads to the disruption of cell-cell connections, and in this manner limited directed cell migration.



**Title:** A child with sepsis - how not to make a mistake

**Authors:** Agnieszka Grabowska, Jan Bieniasz, Wojciech Kuźnicki, Michał Światała

**Session:** Medical Sciences Session I

#### **Introduction:**

Sepsis is a major diagnostic and therapeutic challenge in the pediatric population. Limited knowledge and experience of primary care physicians on the subject of sepsis and frequent non-specific symptoms at the early stages of the disease, both foster adverse events in diagnosis and treatment of sepsis in children. The new 2020 Surviving Sepsis Campaign (SSC) guidelines include separate recommendations for the management of the pediatric population, highlighting the existing need to improve care of the youngest sepsis patients.

#### **Aim of the study:**

Analysis of adverse events in the diagnosis, differential diagnosis and treatment of sepsis in pediatric patients. An attempt to identify the key points determining the correct management.

#### **Material and methods:**

Retrospective analysis of 13 forensic medical opinions issued by the Department of Forensic Medicine, Wrocław Medical University, in medical malpractice cases. Inclusion criterion: clinical or post-mortem diagnosis of sepsis or septic shock. Patients aged 1 month to 18 years; 10 boys and 3 girls.

#### **Results:**

In 12 opinions, the experts found a medical error, which involved exposing the patient to direct danger of loss of life or serious harm to health (Article 160 of the Penal Code). In 12 cases death of a patient which could have been avoidable occurred. In 7 cases the error concerned a diagnostic procedure; in 5/7 the anamnesis and physical examination were incomplete; in 3/7 laboratory tests were missing. Therapeutic errors involving delay or omission of antibiotic therapy, inappropriate fluid therapy or omission of vital signs monitoring were found in 5 cases. In 3 cases, irregularities in the organization of transport between hospitals were found; in 2 cases, there was a delay in hospital admission of a patient in an immediate life-threatening condition.

#### **Conclusions:**

In children with symptoms of sepsis, a careful anamnesis, focused not only on the nature of the symptoms, but also on their onset and further evolution, is vital. In physical examination, particular attention should be paid to vital signs, disturbances of consciousness and skin lesions. When facing expected dynamic deterioration of the patient's condition, it is important to avoid delays in treatment, which may result from inaccurate history taking, improper transport of a patient or delays in admissions to a hospital. In the therapeutic process, rapid and appropriate antibiotic and fluid therapy is essential. Monitoring of vital signs should never be neglected during treatment. The above-mentioned elements are key points to increase the chances of saving the patient's life.



**Title:** Associations of autonomic dysfunction with clinical characteristics of the patients with Parkinson's disease – a pilot study

**Authors:** Jakub Malkiewicz MD, Doctoral advisor: Joanna Siuda MD. PhD.

**Session:** Medical Sciences Session I

#### Introduction:

Dysfunction of autonomic nervous system (ANS) is common in Parkinson's disease (PD). Knowledge about different factors related to ANS dysfunction leading to appropriate diagnosis and treatment, could improve quality of life of PD patients.

#### Aim of the study:

To find associations of ANS dysfunction with clinical characteristics of PD patients.

#### Material and methods:

Data about age, gender, PD duration, Hoehn-Yahr's stage (HYs), cognitive functions, history of depression or presence of depressed mood in psychological assessment, BMI, laboratory findings and used drugs were collected. Autonomic functions were evaluated with SCOPA-AUT questionnaire, where higher score means more severe dysfunction. 5 minute ECG during resting in supine position was utilized to heart rate variability (HRV) analysis in time and frequency domains. Presence of orthostatic hypotension (OH) was assessed in tilt test, where blood pressure was measured in supine position and during 1-st, 3-rd, 5-th minute after tilting to 60°. OH was diagnosed in patients with systolic blood pressure drop  $\geq 20$  mmHg or diastolic blood pressure drop  $\geq 10$  mmHg. 50 patients with PD were assessed. Abnormal thyrotropin or thyroid hormones levels, polyneuropathy, advanced diabetes or heart failure, non-sinus heart rhythm, renal failure, many ectopic beats in ECG used to HRV analysis and incomplete SCOPA-AUT questionnaire were exclusion criteria. Finally 34 patients were included. Mann-Whitney U test, Chi-square test with Yates correction, Fisher's exact test, Spearman and Pearson correlations were used in statistical analysis.

#### Results:

PD patients with more advanced disease (HYs ON  $p=0.016$ , HYs OFF  $p=0.004$ ) depression ( $p=0.011$ ), or those using amantadine ( $p=0.004$ ) had more points in SCOPA-AUT questionnaire. SCOPA-AUT domains analysis revealed that presence of gastrointestinal symptoms were correlated with PD duration ( $p=0.018$ ), higher HY staging (HYs ON and OFF  $p<0.001$ ), depressive disorder ( $p=0.044$ ), lower BMI ( $p=0.012$ ), and use of amantadine ( $p=0.009$ ). Symptoms from cardiovascular domain were more common in females ( $p=0.019$ ) and PD patient with depression ( $p=0.006$ ). Urinary symptoms were significantly associated with depressive disorder ( $p=0.035$ ). Higher HYs were related to more points in thermoregulatory domain of SCOPA-AUT questionnaire (HYs ON  $p=0.16$ , HYs OFF  $p=0.041$ ). OH presented in 11 (32%) of patients was related to cognitive dysfunction (0.044), older age ( $p=0.047$ ), as well as higher level of fasting glucose ( $p=0.014$ ). HRV was affected by PD duration, L-dopa equivalent daily dose, HYs in OFF state fasting glucose and depression.

#### Conclusions:

PD patients with longer disease duration, more advanced HY stage, depression, high fasting glucose level, treated with amantadine and high L-dopa equivalent daily dose might be at risk of having ANS dysfunction.





**Title:** A case of fecal microbiota transplantation ( FMT) in patient with UC and Clostridium difficile

**Authors:** Oliwia Gocel, Karolina Pendrasik, Katarzyna Winter, Ewa Małecka-Panas

**Session:** Medical Sciences Session I

#### Introduction:

The SARS-Cov-2 pandemic has increased the incidence of Clostridium difficile infections. This situation is especially problematic for positive patients with inflammatory bowel disease (UC / CD). In the absence of effective antibiotic therapy, recurrent infections are a challenge. In these cases FMT is recently recommended..

#### Case study:

The 67-year-old female patient with UC was admitted to the Department of Digestive Tract Diseases in Norbert Barlicki Memorial University Hospital in Lodz for microbiota transplantation due to Clostridium difficile infection, not responding to vancomycin treatment. From December 2020, patient showed gastrointestinal symptoms such as diarrhea, weight loss and abdominal pain. In January, the patient was hospitalized due to symptoms and confirmed infection with SARS-Cov-2 in the hospital in Słupca.

After obtaining a negative test for SARS-Cov-2, she was redirected to the Colorectal Surgery Department in hospital in Poznań for further diagnosis of gastrointestinal symptoms.

A colonoscopic examination was performed which showed that the mucosa of the entire intestine is swollen, brittle, bleeding in the contact, ulcerated; Rectal mucosa was red and swollen with yellowish white plaques.

The histopathological examination revealed mild dysplasia, which is almost indistinguishable from inflammatory lesions, with the presence of numerous eosinophils in the stroma.

On March 16, she was rehospitalized in Konin due to persistent diarrhea, caused by infection with Clostridium difficile confirmed in the positive test Clostridium difficile Toxin A/B.

After being admitted to the Department of Digestive Tract Diseases in Norbert Barlicki Memorial University Hospital in Lodz, a colonoscopy was performed which confirmed the earlier diagnosis - UC and C. difficile.

Then the patient was qualified for FMT and 100 ml of intestinal microbiota suspension was administered to the caecum, 50 ml before the hepatic flexure and 50 ml before splenic flexure. The course of the procedure was without any complication. Diarrhea was relieved the next day after the procedure.

#### Conclusions:

FMT seems to be a promising and save therapy in the management of Clostridium difficile infection in Patient with Ulcerative colitis. Additionally, it may be associated with an decrease in microbiota diversity and richness, similarity, and certain change of bacterial composition due to SARS-Cov-2 infection.





**Title:** Catastrophic antiphospholipid syndrome associated with systemic lupus erythematosus

**Authors:** Konrad Bruski, D. M. Sc. Ewa Zarzycka

**Session:** Medical Sciences Session I

#### **Introduction:**

Catastrophic antiphospholipid syndrome (CAPS) is a rare autoimmune disease characterized by diffused thromboembolic events in multiple organs and systemic inflammatory response syndrome (SIRS) with attendance of antiphospholipid antibodies. Due to relatively small amount of reported cases It's hard to work out clinical guidelines with satisfying significance proven by scientific evidence.

#### **Case study:**

Following case concerns 34 years old Caucasian female previously treated for immune thrombocytopenia (ITP) and autoimmune haemolytic anaemia (AIHA) in the course of systemic lupus erythematosus (SLE).

Patient was admitted to Emergency Department in May 2019 due to exacerbation of ITP . She was diagnosed with SLE. Pulses of methylprednisolone and intravenous immunoglobulins (IVIG) were administered. At 3rd of June in computed tomography (CT) of head besides of expected signs of haemorrhages area of encephalomalacia was found. It was identified as signs of previous thromboembolic events. The diagnosis of CAPS was made. She received methylprednisolone, cyclophosphamide, rituximab, low-fractionated heparin and undergone multiple plasmaphereses. Hospitalization course was complicated by multiresistant bacterial infections, respiratory failure incidents, complex psychiatric and neurological symptoms. After two and a half month patient was discharged with supportive treatment (hydroxychloroquine).

#### **Conclusions:**

We would like to emphasise with this report importance of precise diagnostics of thromboembolic symptoms. In this case CAPS presented with unusually low titers of antiphospholipid antibodies; there was no histopathological examination performed, two ultrasonographic examinations haven't proved deep vein thrombosis.

We would like to raise awareness of early treating of CAPS even without fully meeting Asherson's criteria.<sup>1</sup> We also hope that our contribution into reported CAPS cases will help to evaluate rituximab as first choice treatment in this syndrome.



**Title:** Adolescent congenital central hypoventilation syndrome: an easily overlooked diagnosis

**Authors:** Marta Ditmer, Szymon Turkiewicz, Agata Gabryelska, Marcin Sochal, Piotr Białasiewicz

**Session:** Medical Sciences Session I

#### Introduction:

Congenital central hypoventilation syndrome (CCHS), more commonly known as Ondine's curse, is a rare, potentially fatal genetic disease. There are only 300 cases worldwide, in majority pediatric. Diagnosis of CCHS in adult and adolescent patients is rare, this makes this case unique. Symptoms of CCHS include hypercapnia, right ventricle (RV) hypertrophy and pulmonary hypertension.

#### Case study:

In 2003 a 14-year-old female was admitted to the Cardiology Department with acute pericarditis and fluid accumulation in the pericardium. Medical history revealed multiple hospitalizations requiring mechanical ventilation and recurring respiratory tract infections. Cyanosis was observed during sleep. Patient's spirometry, body plethysmography, lung diffusion and residual capacity were normal, yet gasometry results before and after 10 minutes of hyperventilation changed significantly (pO<sub>2</sub> 68.6mmHg to 82mmHg saturation 93.2% to 97.6%). Echocardiography showed dextrocardia and RV hypertrophy. Cardiac catheterization was performed in order to assess pulmonary hypertension. During the procedure, the patient had an apneic episode after pethidine. RV hypertrophy, low oxygen saturation, cyanosis and otherwise unexplained respiratory failure after analgesics led to the consideration of CCHS as a possible diagnosis. Antibiotic pericarditis treatment was successful and the patient was referred to the Sleep Medicine Department to undergo polysomnography (PSG). As expected, central sleep apnea was confirmed. Genetic tests were performed. The patient was heterozygous for the PHOX2B polyalanine expansion mutation, genotype 20/25, which confirmed the diagnosis of CCHS. The mutation was absent in the patient's parents' genomes thus it was either de novo mutation or a result of germline mosaicism. The chosen form of treatment was Bi-PAP with nasal mask. In 2014 after PSG, a full-face mask was applied to avoid desaturation periods. As of 2021, the patient still uses Bi-PAP with full-face mask and has no additional complications associated with CCHS.

#### Conclusions:

CCHS is a rare, possibly underdiagnosed condition in adult and adolescent patients with mild symptoms. It requires clinical vigilance and proper management. Disregard of the symptoms might lead to serious health consequences resulting from hypoxia, hypercarbia and sleep apnea, such as pulmonary hypertension and cardiac hypertrophy. However, adequate therapy allows patients to lead a normal life and avoid aforementioned sequelae of sleep apnea.



**Title:** Diagnostic dilemma in severe course of multicentric Castleman disease - case report

**Authors:** Michalina Tamowicz

**Session:** Medical Sciences Session I

#### **Introduction:**

Castleman's disease (CD) is a rare benign lymphoproliferative disorder occurring in two forms: unicentric (UCD) and multicentric (MCD). In UCD, 50% of patients remains asymptomatic, while MCD can manifest as systemic inflammation resulting from an excessive production of proinflammatory cytokines. Subtypes of MCD include idiopathic MCD (iMCD) with TAFRO (Thrombocytopenia, Anasarca/Ascites, reticulin bone marrow Fibrosis, Renal failure, Organomegaly) and non-TAFRO clinicopathological variants. Both subtypes happen to have overlapping clinical features which makes distinction between them difficult.

#### **Case study:**

We report a case of 50-year old woman, who was admitted with a 3-week history of malaise, fever, stabbing pain in right hypochondrial area, itching of forearms, loss of appetite and general swelling. She had cardiac infarction at age of 47, 15 pack-years of smoking and a family history of systemic lupus erythematosus. Initial laboratory testing showed elevated C-reactive protein, thrombocytosis and leukocytosis with normal hemoglobin. Computer tomography revealed pleural effusion, hepatosplenomegaly and mediastinal lymphadenopathy up to 26mm. Differential diagnosis included infections, autoimmune disorders, neoplasms, work-up for multiple viruses and autoantibody profile. A bone marrow biopsy was not diagnostic. Histological evaluation of lymph node biopsy revealed picture consistent with Castleman disease, hyaline – vascular type. Given the patient's clinical presentation, including non-infectious widespread lymphadenopathy, hepatosplenomegaly, anasarca, renal failure and histology findings indicated severe course of iMCD or iMCD with TAFRO. Treatment was initiated with high dose of methylprednisolone and rituximab, followed by tocilizumab, without regression of symptoms. Therefore, cyclophosphamide and vincristine were administered leading to brief improvement, followed with deterioration again. She received the second dose of rituximab, tocilizumab and bortezomib, after which improvement occurred in patient general condition.

#### **Conclusions:**

Castleman disease is a rare cause of enlarged lymph nodes with various manifestations. This case underline the importance of differential diagnosis and histological findings in patients with lymphadenopathic presentation associated with systemic symptoms. Although MCD is rather uncommon cause for such presentation, it should be taken into consideration, when non-infectious lymphadenopathy occurs.

**Title:** Breast adenoid cystic carcinoma: a rare triple-negative breast cancer. A case report and diagnostic pitfall

**Authors:** Michał Zwoliński, Katarzyna Matczak, Anna Bieniek, Adrian Hovagimyan

**Session:** Medical Sciences Session I

#### Introduction:

Adenoid cystic carcinoma (ACC) is a salivary gland-type, triple-negative breast carcinoma (TNBC) accounting for less than 0.1% of all mammary cancers.

It predominantly affects postmenopausal women, with a few described cases among men.

The tumour is typically composed of a dual population of luminal and myoepithelial cells, forming tubular, cribriform and solid (basaloid) architectural patterns. The cells form distinct, punched-out spaces or pseudocysts containing hyaline basement membrane material.

CK7, EMA, CK5/6, CD117 are the most reliable markers for luminal cells. S100, p63/p40, SOX10, actin, calponin and vimentin are the markers for myoepithelial cells. Estrogen and progesterone receptors, and HER2 are negative.

ACC has a relatively favourable survival prognosis. It rarely gives metastases as this tumor is generally well-differentiated and slowly growing unlike other triple-negative basal-like breast cancers. Because of variety of microscopic patterns, ACC can mimic benign changes such as: adenosis, collagenous spherulosis and cylindroma. As well as malignant lesions: other types of primary and metastatic breast carcinoma, first of all invasive duct carcinoma, which require different treatment.

#### Case study:

69-year-old woman was admitted to hospital with painless tumour of the right breast. Clinical assessment showed a lump 5 cm in diameter. Core needle biopsy (CNB) was performed. The samples were scant and fragmented. Due to some papillary structures and hyalinising stroma the diagnosis of probably benign lesion of papillomatous character was established. CK 5/6 and p63 were partially positive. Because of discrepancy between pathological and radiological diagnosis the additional biopsy was taken. In this material there was invasive carcinoma, triple negative, p63, SMA, CK 5/6, CK 7 positive, S100 focally positive, Ki 67 was 50%. There were solid areas (over 30%). It has been diagnosed as Carcinoma adenoides cysticum G3. A radical mastectomy (R0) with lymphadenectomy was performed, there were no metastases in the lymph nodes. The patient received adjuvant chemo- and radiotherapy. Currently, the patient is in a good state of health with no symptoms of an active disease.

#### Conclusions:

ACC is a rare TNBC with variety of morphological patterns which can cause diagnostic problems when a pathologist is provided with tiny tissue specimens obtained by CNB. Differential diagnosis should be performed with both benign and malignant conditions.

The diagnosis is important because treatment and prognosis of ACC are different comparing with other TNBCs.

Surgery is a treatment of choice with good results and excellent survival prognosis.

Adjuvant RT may be beneficial because of a high rate of positive surgical margins.

ChT is controversial and probably doesn't have any influence on survival.



**Title:** Life in displeasure, id est occurrence of pain among elderly people

**Authors:** Aleksandra Piotrowska, Oliwia Jarosz, Aleksandra Modlińska, Jakub Husejko, Hanna Bednarek

**Session:** Medical Sciences Session I

#### **Introduction:**

Generally understood pain is one of the biggest problems faced by the elderly. This commonly known phenomenon, referred to in the literature as an unpleasant sensory experience, not only hinders everyday activities, but also lowers the mood and well-being. It has been proven that pain has a significant impact on the functional efficiency of people of all ages, but in seniors it is a particularly important phenomenon that deprives them of independence.

#### **Aim of the study:**

The aim of the study was to demonstrate the degree and location of pain in elderly patients.

#### **Material and methods:**

The study lasted from October to December 2019 and took places at the Clinic of Geriatrics of the University Hospital No. 1 in Bydgoszcz. As part of medical examination had data collected on the basis of questionnaires from patients aged between 60 and 83 on the occurrence of the pain phenomenon and its area, duration, intensity and intensity were analyzed.

#### **Results:**

Out of the group of 36 subjects, whose average age was 71 years, it was shown that as many as 22 people experienced pain related to the locomotor system. 14 of 22 patients was feeling pain chronically in at least one area of the body. The lumbar spine significantly stands out among the pain parts, as 21 people reported any complaints in this area. The head, cervical and thoracic spine appeared in comparable numbers among the respondents. The responses showed that the musculoskeletal system is the main source of pain in elderly patients, but on the VAS scale, patients tend to mark its level on a scale from 0 to 10, on average values mainly between 4 and 7. As many as 19 respondents noted the fact that pain can be bothersome and had been lasting longer than 3 months, which indicates the tendency of seniors to chronic discomfort, which may be caused by degenerative processes in the body.

#### **Conclusions:**

Pain among the elderly may be common and frequent. Usually, it is chronic and troublesome, which may be associated with natural changes in the human body as a result of aging processes, such as degeneration or overload. The most common pain is in the lumbar spine, which is often part of the NSLBP (Non-Specific Low Back Pain) phenomenon.



**Title:** A case report of a 43-years-old patient after lung transplantation due to idiopathic pulmonary arterial hypertension supported on extracorporeal membrane oxygenation because of bronchial haemorrhage and bronchial stenosis

**Authors:** Paweł Sybila, Kaja Pelar

**Session:** Medical Sciences Session I

### Introduction:

Idiopathic pulmonary arterial hypertension (IPAH) is a disease characterised by increased pulmonary arterial pressure without an identified cause. IPAH eventually leads to death by means of end-stage right ventricular failure. Lung transplantation (Ltx) remains the only viable option for patients with refractory IPAH. One of the most common complications after LTx is bronchial stenosis. The severe, acute and symptomatic onset of respiratory failure in course of bronchial stenosis may require the most advanced intensive care techniques including extracorporeal membrane oxygenation (ECMO).

### Case study:

In June 2016 a 40-years-old patient diagnosed with IPAH in WHO class III was admitted to hospital due to an exacerbation of right ventricular failure which was confirmed in cardiac ultrasound examination after admission. NT-proBNP reached 1437.0 pg/ml. It was decided to reevaluate the patient for lung transplantation. The procedure took place in January 2017. Postoperatively, she required multiple bronchoscopic interventions due to airway obstruction caused by the ischemia-reperfusion syndrome.

2 years later after the lung transplantation, routine balloon bronchoplasty of the main right bronchus was performed due to increasing granulation tissue and dyspnoea. During the procedure, a massive bronchial haemorrhage occurred. Because of the fragility of the vessels, it was decided to perform stent implantation over the previously implanted stent. However, that did not stop massive haemorrhage from the vessel near the anastomotic site. The decision was made to start circulation on ECMO V-A due to severe hemodynamic instability. ECMO was explanted 24 hours after the bleeding had stopped. The patient was then extubated and started rehabilitation. Since then she still required frequent bronchoscopic interventions, which were carried out without complications.

However, in January 2019 she was admitted in order to have the balloon bronchoplasty performed the next day. On the evening of admission, she developed acute respiratory failure due to the complete closure of one of the main bronchus. It resulted in shunting so severe that the patient had to be supported on ECMO despite previous intubation and mechanical ventilation. Under general anaesthesia and using ECMO, the bronchoplasty of the closed bronchus was performed. She had ECMO explanted and was consecutively extubated. Due to tissue overgrowth in the stent area, the patient's treatment was changed to sirolimus. Tacrolimus was discontinued. Satisfactory results have been obtained.

### Conclusions:

Lung transplantation saves and prolongs life. However, the course after the procedure may be complicated with bronchial stenosis. Treatment consists of bronchoscopic interventions.

The use of ECMO makes it possible to stabilize a patient with severe respiratory failure caused by treatment complications of bronchial stenosis as well as bronchial stenosis itself.



**Title:** Treatment of heterophoria with botulinum toxin - case study

**Authors:** Przemysław Raczkiewicz, Natalia Śmiech, Maria Kalicka, Tomasz Korzec, Martyna Nowińska

**Session:** Medical Sciences Session I

### Introduction:

Heterophoria (latent strabismus) is an imbalance in the tone of the oculomotor muscles. In a young child this disorder usually does not affect the development of binocular vision. While viewing, binocular vision (image fusion) keeps the eyeballs straight. With age binocular vision may be impaired for example as a result of trauma, general disease, stress or severe fatigue and strabismus (heterotropia) may be revealed, which causes double vision. 20 year old man consulted a doctor with paroxysmal headaches, fatigue, problems with concentration and reading. The patient as a first year student recently had increased mental effort, these pain symptoms disturbed his functioning. Internal and neurological examination did not reveal any pathologies. Blood tests: Iron, Glucose, TSH, Vitamin D3, Creatinine, Morphology, Urea were within the limits of the standard. The patient was referred for an MRI of the head with contrast. The radiographic examination was normal, the brain's structures remained unchanged. The patient went to the optometrist. Ophthalmological examination showed latent strabismus and low fusional reserves. After 3 treatments of botulinum toxin injection, the strabismus angle was reduced by 86%. The patient felt a significant improvement after the procedure: headaches, difficulty concentrating and double vision passed.

### Case study:

The case shows the possibility of curing an adult with botulinum toxin, in whom heterophoria (latent strabismus) has turned into strabismus (heterotropia).

### Conclusions:

Despite its transient kinetics, botulinum toxin can have a lasting effect on eye alignment, favoring binocularity and reducing double vision, can serve as a primary treatment. To obtain a permanent effect, it is necessary to repeat the treatment.



**Title:** Significantly reduced visual acuity in a 34-year-old man - a rare case of acute posterior multifocal placoid pigment epitheliopathy

**Authors:** Maciej Lazarek, Magdalena Milewska, Paweł Niewiadomski, Katarzyna Zabel

**Session:** Medical Sciences Session I

### Introduction:

Acute posterior multifocal placoid pigment epitheliopathy (APMPPE) is an idiopathic uveitis belonging to the white dot syndromes. It occurs more commonly in females and affects mostly people between 20 and 30 years of age. Symptoms of the disease include bilateral decreased visual acuity, central and paracentral scotomas and photopsia. 30% of patients developed flu-like symptoms, it is probably related to the presence of HLA-B7 and HLA-DR2 antigens.

### Case study:

A 34-year-old man presented to the Ophthalmology Clinic with decreased visual acuity, haziness and dark spots in the visual field of both eyes. The best-corrected visual acuity of the right eye was 0.8; of the left eye, 0.2. Fundus examination of both eyes revealed multifocal, plaque-like, creamy-white, and grayish foci in the posterior pole and mid periphery, which on optical coherent tomography showed hyperreflectivity and blurring of the outer retinal layers. Fluorescein angiography could show hypofluorescence in the early stages and diffuse hyperfluorescence in the late stages.

Excluding other causes of complaints and based on the ophthalmologic findings, a diagnosis of acute posterior multifocal placoid pigment epitheliopathy (APMPPE) was made. Due to a significant decrease in visual acuity, a decision was made to initiate general steroid therapy. Several months after hospitalization, follow-up examinations were performed, in which areas of atrophic changes corresponding to hypoautofluorescence and areas of hyperplasia of the retinal pigment epithelium corresponding to hyperautofluorescence on fundus autofluorescence (FAF) examination were found on the fundus.

On angio-OCT, abnormalities were observed, mainly in the choriocapillaris layer in the form of hypoperfusion of the macular region, which is most likely related to damage to the outer retinal layers. Despite the improvement of the local condition after the applied treatment, no significant improvement of vision was obtained.

### Conclusions:

The use of corticosteroids in the treatment of APMPPE remains controversial, as the disease tends to resolve spontaneously. The differential diagnosis of APMPPE can be complicated by its similarity to other inflammatory choriocapillaropathies.

**Title:** Acute myocardial infarction in COVID-19 and Non–COVID-19 patients

**Authors:** Daniel Gondko, Marta Gorczyca, Adam Grzebinoga, Jakub Roman, Maria Stec, Agata Suleja

**Session:** Medical Sciences Session I

### Introduction:

Severe acute respiratory syndrome coronavirus 2 (Sars-Cov2) has affinity to cardiovascular system via ACE receptors, what may lead its major impact on the clinical course of acute myocardial infarction (AMI).

### Aim of the study:

The aim of the study was to compare in-hospital course and 3-month survival of AMI patients with and without Covid-19 infection in pandemic period.

### Material and methods:

Overall, 150 consecutive patients with AMI hospitalized at one tertiary reference cardiology center, between October 2020 and January 2021: 30 with COVID-19 (mean: age 74.5 years; 40% STEMI; 40% with radiologically confirmed pneumonia) and 120 without COVID-19 infection (mean: age 69.2 years; 31% STEMI; 5% with radiologically confirmed pneumonia) were enrolled into the study. Analysis involved clinical characteristics, laboratory tests, results of imaging methods, in-hospital as well as 3-month survival rate.

### Results:

COVID-19 patients were older ( $p=0.029$ ), had significantly lower left ventricular ejection fraction ( $p=0.019$ ), higher troponin I ( $p=0.006$ ) and CK-MB ( $p=0.031$ ) levels. Infected subjects presented higher level of d-dimer (12x normal range), hsCRP (16x normal range) and IL-6 (260x normal range). In COVID-19 patients troponin I concentration positively correlated with hsCRP level, white blood cells count and neutrophils count. Primary PCI was performed in 68% COVID-19 and in 90% non-COVID-19 patients ( $p=0.03$ ). Hospitalization was longer in COVID-19 subjects ( $p=0.003$ ) and atrial fibrillation was more frequent in this group ( $p=0.014$ ).

Both in-hospital mortality (33% vs 13%,  $p=0.004$ ) as well as 3-month mortality (53% vs 20%,  $p=0.001$ ) was higher in COVID-19 group.

### Conclusions:

COVID-19 infection significantly modifies a clinical course of AMI. There is observed more severe myocardial damage related to inflammatory activation and less invasive reperfusion treatment, prolonged and complicated hospitalization and higher 3-month mortality rate.



**Title:** Psoriasis and Metabolic syndrome: prevention and holistic approach

**Authors:** Aleksandra Nowicka

**Session:** Medical Sciences Session I

#### **Introduction:**

Psoriasis vulgaris is a chronic autoimmune inflammatory disease of genetic origin. It can appear at any age and affect up to 4% of the world's population. Psoriasis manifests itself mainly in the form of skin symptoms, however, it can be accompanied by a number of other disease entities with common pathogenetic pathways. This group of diseases includes the metabolic syndrome (MS), which together with psoriasis increases the risk of developing cardiovascular diseases and diabetes. The metabolic syndrome can be diagnosed when a patient exhibits abnormalities in 3 out of 5 criteria including waist circumference, triglyceride levels, HDL-C, blood pressure, and fasting glucose.

#### **Aim of the study:**

The aim of the study is to draw attention to the frequently increasing documented relationship between the occurrence of psoriasis and metabolic syndrome as well as cardiovascular diseases, and the importance of properly implemented prevention of these diseases.

#### **Material and methods:**

Researchers at Peking Union Medical College Hospital in Beijing enrolled a total of 2577 patients in the study with 859 adult patients suffering from psoriasis and 1718 patients qualified as a control group. They met a number of criteria and were appropriately selected in terms of gender, age, ethnicity and examined for blood pressure, screened for obesity/overweight, hypertension, hyperlipidemia, and type 2 diabetes. Venous blood was collected to assess fasting glucose, triglyceride, and high-density lipoprotein levels (HDL).

#### **Results:**

Based on the results of the research, it was conclusive that the group of patients suffering from psoriasis were counted with more frequent occurrence of obesity/overweight, hyperglycemia, hypertriglyceridemia and decreased HDL levels. The data obtained was used to diagnose the metabolic syndrome in these patients. The group of patients suffering from psoriasis was characterized by a higher incidence of metabolic syndrome compared to the control group, 14.3% and 10%, respectively.

#### **Conclusions:**

The simultaneous occurrence of psoriasis and cardiometabolic diseases suggests taking measures aimed not only at treating the underlying dermatosis, but also taking a holistic approach to the patient and proper treatment of comorbidities. The metabolic syndrome is classified as a civilization disease, therefore it is crucial to introduce screening tests in patients with psoriasis due to the fact that they are significantly more exposed to it than the healthy population. Prevention, faster diagnosis of disorders and education of the patients are not only the most important factors in the prevention of comorbidity, but also affect the patient's well-being and quality of life.

**Title:** The effect of ciprofloxacin on bladder cancer cells in 3D culture

**Authors:** Aleksandra Wolska, Tomasz Kloskowski, Kamil Szeliski, Zuzanna Fekner, Tomasz Drewa, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

### Introduction:

The 2D cell culture is still one of the standard methods to test the anti-cancer drugs effectiveness, but lately the scientists are learning more about the 3D cell cultures that mimic the in vivo conditions better. One of the advantages of the 3D method is the possibility to check how the tested drug penetrates the tissue.

### Aim of the study:

The aim of this study was to evaluate the cytotoxic properties of ciprofloxacin on human bladder cancer cells (T24) and normal human urothelium cells (SV-HUC-1) cultured in a 3D spheroid form.

### Material and methods:

Spheroids were prepared using the ultra-low attachment 96 well plates. Three different concentrations of ciprofloxacin (LC10, LC50, LC90), calculated in a previous study, were used. Mitomycin C was used as a control drug in the same concentrations; the cells were incubated with the drugs for 24h and 48h. To determine the number of viable cells in the 3D cell culture luminescence assays using plate reader and an analysis in fluorescence microscope were carried out.

### Results:

Both the mitomycin C and ciprofloxacin have decreased the number of viable cells in the spheroids in a concentration dependent manner. The luminescent viability assay showed that the lower concentrations of ciprofloxacin used on T24 didn't work as well as the same concentrations of mitomycin C. In the case of LC90 the results were more similar. The calculated concentration reducing 50% of cell viability in 2D cultures was not effective on 3D spheroids. The spheroids appeared larger while treated with the LC90 because of the loosening of the structure due to the death of external cells. In the case of SV-HUC-1 cell lines, ciprofloxacin showed weaker effects compared to the cancer cell line. Fluorescence analysis confirmed luminescence assay and only in the highest tested concentration increase in number of death cells was observed.

### Conclusions:

Although the ciprofloxacin treatment gave worse results than mitomycin C, the fact that it accumulates in the urine after the oral and intravenous administration in a high concentration can extend the exposure time of this drug. Another advantage of ciprofloxacin is also a weaker cytotoxic effect on normal SV-HUC-1 cell line. All in all the ciprofloxacin has promising properties as a supportive drug in bladder cancer treatment.



**Title:** Ophthalmic manifestation of Cat- scratch disease in 9-years old female patient – case report

**Authors:** Anna Kopeć, Agnieszka Pecyna, Martyna Pietrzak, Katarzyna Zabel

**Session:** Medical Sciences Session II

#### Introduction:

Cat scratch disease (CSD) is an infectious zoonotic disease caused by the Gram negative bacterium *Bartonella henselae*. It most often affects children and adolescents. The reservoir for *Bartonella henselae* are domestic animals, especially cats. Infection occurs as a result of scratching, biting or contact with the saliva of the host animal. Infection symptoms include mild fever, malaise, myalgia and occasional rashes. In most cases of CSD, regional lymphadenopathy and subacute lymphadenitis occur. Most cases are benign and self-limiting, but disease may affect many organs and could be associated with ocular complications, which may include neuropapillitis, papilloedema, and retinitis. Complications, which may require intensive treatment, are more likely to occur in children and people with weakened immune systems.

#### Case study:

9- years old female patient was admitted to the Emergency Department because of visual defect- central scotoma (a black spot placed centrally in the visual field). Scotoma first occurred 3 months earlier, when she was hospitalized due to fever of unknown origin (FUO) and abdominal pain. Back then urine culture was negative, no abnormalities were imaged during abdominal ultrasound, the C-Reactive Protein level were slightly elevated; after 3 days of empiric antibiotic therapy, she was discharged upon her mother's request.

The patient was diagnosed with reduced visual acuity of right eye and higher intraocular pressure in right eye than in left eye, but within normal ranges. Ophthalmoscopic examination showed signs of papillitis and retinal swelling, macular star of lipid exudates and peripheral focal masses (which presented signs of subretinal fibrous proliferation in Optical Coherence Tomography- OCT) of right eye. No other abnormalities were found, both in ophthalmic and pediatric examination.

Due to suspicion of an infectious disease patient was referred to further diagnosis in Infectious Diseases Hospital, where blood serology for *Bartonella henselae* proven positive. Patient was diagnosed with cat scratch disease and treated with systemic antibiotics and steroids.

During 2 month follow-up most of abnormalities in examination disappeared. OCT examination showed atrophy of outer layers of retina. Despite inflammation decrease, there was no improvement of visual acuity.

#### Conclusions:

*Bartonella henselae* infections are quite common in Poland, but they are rarely recognized due to uncharacteristic symptoms in most cases. Therefore we need to consider bartonellosis in every patient with FUO, especially when it's accompanied with visual defect- ocular manifestation of CSD is second most prevalent atypical form of this disease. Usually the prognosis about improvement of visual acuity is promising in case of combined antibiotics and corticosteroid treatment, but- as in this case- full visual recovery is uncertain. Therefore it is very important to diagnose and treat CSD in early stages of disease.





**Title:** Human Adipose Derived Mesenchymal Stromal/Stem Cells differentiation into chondrocytes in vitro

**Authors:** Damian Kasiński, Marta Rasmus, Daria Balcerczyk, Justyna Durślewicz, Dariusz Grzanka, Tomasz Drewna, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

#### Introduction:

Articular cartilage defects due to injury or other pathology are difficult to heal. The results of the clinical treatment used today are not satisfactory. Adipose Derived Mesenchymal Stromal/Stem Cells (AD-MSCs) are multipotent stem cells with the multilineage differentiation capacity. Tissue engineering methods based on the ability of AD-MSCs to differentiate into chondrocytes provides a new idea for regeneration of articular cartilage defects..

#### Aim of the study:

The aim of the study was to develop a method of chondrogenic differentiation of human Adipose Derived Mesenchymal Stromal/Stem Cells in vitro.

#### Material and methods:

Cells were isolated from subcutaneous adipose tissue harvested from 3 patients from the abdominal region, during minimally invasive liposuction. After the isolation, cells were cultured up to 3 passages in two culture media: medium I (MEM) and medium II (DMEM). The immunophenotype of AD-MSCs was confirmed by cytometric analysis. After the third passage, AD-MSCs were seeded into 24-well culture plates using 3 methods: monolayer, aggregates and alginate beads. Cells in aggregates and alginate beads were seeded in two densities:  $1 \times 10^5$  and  $1,5 \times 10^5$  cells per bead/aggregate. The culture was carried out for 14 days in differentiation medium and two control media. After the culture, the cells were stained with hematoxylin and eosin, toluidine blue and alcian blue to assess the chondrogenic differentiation of the stem cells.

#### Results:

AD-MSCs cultured in the monolayer did not show chondrogenesis features in the differentiation medium and both control media. AD-MSCs cultured in aggregates in differentiation medium successfully differentiated into chondroblasts. AD-MSCs cultured in aggregates at the density of  $1 \times 10^5$  formed more chondroblasts than those cultured at the density of  $1,5 \times 10^5$ . In contrast, AD-MSCs cultured in aggregates in both control media did not show any differentiation features. AD-MSCs cultured in alginate beads in the differentiation and the first control medium (MEM) were differentiated into chondroblasts and single chondrocytes.

#### Conclusions:

AD-MSCs are capable of chondrogenic differentiation in vitro culture. The cell seeding density had an influence on the differentiation in the case of culture carried out in aggregates. The most effective of the three compared methods of chondrogenic differentiation of AD-MSCs was the culture of cells in alginate beads. The dimensional structure in which the culture of AD-MSCs is carried out has a significant influence on the process of chondrogenic differentiation of AD-MSCs.



**Title:** Decellularized human amniotic membrane as a material in the regeneration of elements of the urinary system. In vitro study

**Authors:** Hanna Piszczek, Tomasz Kloskowski, Zuzanna Fekner, Paweł Dąbrowski, Tomasz Drewa, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

#### **Introduction:**

Human amniotic membrane is one of the promising materials for regeneration and reconstruction of the urinary system elements. As the outermost membrane of the placenta it is relatively easily accessible. Low immunogenicity, anti-inflammatory and antibacterial properties, increase the likelihood of a successful regeneration. The decellularization of the amniotic membrane is a process that enables the preparation of this material as a cells carrier for regenerative purposes.

#### **Aim of the study:**

The aim of this study was to develop the amniotic membrane decellularization process for its application in the regeneration of the urinary tract elements.

#### **Material and methods:**

The study was performed on the human amniotic membrane prepared from placenta, taken during a planned caesarean section. The decellularization method used in this study was performed on the basis of protocol described by Milan et al. (2009). Human amniotic membrane was incubated with 2% detergent sodium dodecyl sulfate for 2 and 72 hours with additional mechanical removal of cellular elements using a scraper. To confirm the effectiveness of the decellularization process, a histological analysis using hematoxylin-eosin staining, fluorescent staining with DAPI, DNA isolation from lyophilized amniotic membrane and the cytotoxicity evaluation of the material using the MTT test were performed.

#### **Results:**

Histological analysis showed the lack of cellular elements on the membrane surface after 2 and 72 hours incubation with sodium dodecyl sulfate. Molecular and fluorescent analysis showed the presence of genetic material decreased significantly after prolonged incubation time with SDS solution. Lack of cytotoxic effect of amniotic membrane extracts was observed after 72 hours of rinsing the material in water with antibiotics.

#### **Conclusions:**

The proposed decellularization method allowed the removal of cellular elements from the surface of amniotic membrane. However, in order to classify the method as effective, it is necessary to carry out further analysis for removal of residual genetic material.



**Title:** Comparison of small Extracellular Vesicles purification protocols from human serum and urine

**Authors:** Kamil Szeliski, Filip Kowalski, Tomasz Drewa, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

### Introduction:

Small Extracellular Vesicles (sEVs), with 30-200nm diameter, mostly composed of exosomes are group of Extracellular Vesicles getting the most interest in cancer diagnostic applications. The variety of possible carried cargo makes them a rich source of biomarkers for malignancies diagnosis. One of the crucial part is a choice of purification method, which allows separation of vesicles of proper size and number, lacking non-vesicular impurities, which can significantly affect obtained results, and with methodological ease, enabling their further application.

### Aim of the study:

The aim of this study was comparison of different non-ultracentrifugal sEVs purification methods, from peripheral blood serum and urine.

### Material and methods:

Urine and blood samples were collected from patients qualified for Radical Prostatectomy for Prostate Cancer treatment. Before sEVs separation, pre-purification of serum and urine was performed by series of centrifugation steps: 2x 2000xg, 10 min, for cells and cell debris removal, followed by 14 000xg, 45 min, 4°C for larger vesicles removal. Additionally after pre-purification urine was concentrated with 10kDa Centrifugal Filters. Samples prepared in such manner were subjected to 3 sEVs purification methods: MI: Precipitation with PEG; MII: Size Exclusion Chromatography; MIII: Immunomagnetic separation of CD9, CD63, CD81 positive vesicles. Size and concentration of obtained sEVs were analysed with Tuneable Resistive Pulse Sensing. Protein to vesicle concentration ratio was used for purity analysis. Additionally, surface markers analysis for selected tetraspanins (CD9, CD63, CD81) was performed by flow cytometry.

### Results:

The results show that the highest number of isolated sEVs/ml of sample from serum was obtained with MII, however for urine samples the highest number was obtained with MIII. The purity of obtained vesicles differed between sources, with generally higher protein/vesicles ratio obtained in serum than in urine. The highest amount of protein contamination in serum samples was observed with MIII and lowest with MII. In urine samples MI and MIII gave similar, higher protein/vesicles ratio results than MII. Significantly higher size of sEVs was observed for MI in serum samples, which can be caused by clumping of smaller vesicles. No significant differences were observed in tetraspanins levels in obtained sEVs.

### Conclusions:

These results show that sEVs can be successfully obtained from both sources with all of the selected methods. However most optimal methods differ between sources, and different methodology for analysis of sEVs from urine and serum should be considered.

**Title:** Efficacy and safety of novel collagen conduits filled with collagen filaments to treat patients with peripheral nerve injury: A multicenter, controlled, open-label clinical trial

**Authors:** Michalina Wachulec

**Session:** Medical Sciences Session II

### Introduction:

Peripheral nerve injury has been so far treated with two methods: 1) suturing the two ends of the severed nerve (in cases where the injury was not extensive) or 2) joining the two ends with an autologous graft. Unfortunately, grafting method requires the severing of an uninjured nerve, usually the calf nerve. The possibility of joining the nerve defect using an artificial nerve canal as a new method has been investigated.

### Aim of the study:

The purpose of this work is to highlight the development of treatment of peripheral nerve injuries with less invasive method (artificial nerve conduit).

### Material and methods:

The study used a conduit created entirely of collage, consisting of an outer cylinder filled with fibres. Patients with a nerve defect  $\leq 30$  mm at the level of the wrist or a more distal were eligible for the study. The method of treatment for the injury was chosen by the patient. Then sensory recovery using static two-point discrimination and adverse events were compared between the artificial collagen nerve conduit and autologous nerve grafting.

### Results:

The study included 49 patients who underwent the artificial nerve conduit and 7 patients who underwent nerve graft surgery. Because of the large difference in the number of patients in the two groups, it was decided to use archival data from 31 patients who underwent nerve grafting (in whom there were data on sensory recovery at 12 months after surgery). The results of perceived sensory improvement of the damaged site were compared to the unaffected site, and the progress of regeneration was evaluated on this basis.

36 (75.0%) patients undergoing nerve repair using a collagen channel and 28 (73.7%) undergoing nerve grafting regained sensory function by 12 months after surgery.

Collagen channel 44% (3 months postoperatively)

Nerve grafting 57% (3 months after surgery )

### Conclusions:

This study provides evidence that satisfactory treatment results can be achieved using an artificial nerve conduit to bridge defects  $\leq 30$  mm in length. This was the first study to evaluate the efficacy of artificial collagen fiber-filled nerve conduits in humans. Based on the data, grafting an artificial collagen nerve conduit may be a suitable alternative to autologous nerve grafting for the treatment of peripheral nerve injuries.

**Title:** Evaluation of various methods of deoxyribonucleic acid isolation from adipose tissue

**Authors:** Paweł Dąbrowski, Marta Rasmus, Arkadiusz Jundziłł, Tomasz Drewa, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

### Introduction:

Adipose tissue is used in various medical application. Due to the large amount and easy availability, white adipose tissue is a good source of mesenchymal stromal cells used in tissue engineering and regenerative medicine. Clinical use of these cells still require additional research. Basic step for molecular analysis is nucleic acids isolation which can be problematic because of the large amount of lipid vacuoles in adipocytes.

### Aim of the study:

The aim of the study was to compare and evaluate selected methods of deoxyribonucleic acid isolation from adipose tissue.

### Material and methods:

The tested material was subcutaneous porcine adipose tissue, which was subjected to different ways of homogenization and DNA isolation. Disruption in liquid nitrogen with mortar and pestle or ceramic beads were used for homogenization. After homogenization samples were subjected to three different methods of DNA isolation: organic extraction (TriPure Isolation Reagent), spin columns with silica-membrane (High Pure PCR Template Preparation Kit) and automatic MagNA Pure LC 2.0 System. Five combination were compared for DNA isolation: method I – homogenization with ceramic beads and organic extraction; method II – disruption in liquid nitrogen and organic extraction; method III – spin column isolation; method IV – disruption in liquid nitrogen and spin column isolation; method V – homogenization with ceramic beads and automatic isolation. Obtained samples were subjected to qualitative and quantitative analysis. Concentration (A260), purity (A260/A280) and degradation (DNA Integrity Number, DIN) were measured. The results were subjected to statistical analysis using the SPSS Statistics.

### Results:

Among tested methods the spin-column purification stands out with significantly higher DNA yield, purity and integrity. Required values of A260/A280 ratio was achieved only for spin column-based DNA isolation methods (III and IV). Additional homogenization with liquid nitrogen, mortar and pestle allowed to shorten the digestion of tissue from about an hour to 10 minutes. The average DNA yield per tissue amount was the highest for the spin-column method IV –  $428,25 \pm 102,14$  ng/mg and the lowest for the automatic method V –  $70,40 \pm 20,03$  ng/mg. The less degraded DNA was in method III with DIN values exceeded 9. Differences at the significance level of  $p < 0.05$  were considered statistically significant.

### Conclusions:

The most effective DNA isolation from adipose tissue are both methods using spin-column (M-III and M-IV). These are characterized by high integrity, purity and DNA yield. Other tested methods because of low DNA yield, purity or integrity cannot be recommended for DNA isolation from an adipose tissue.



**Title:** Comparison of the anticancer properties of six different quinolones, an in vitro study on urinary bladder cancer cells

**Authors:** Zuzanna Fekner, Kamil Szeliski, Tomasz Kloskowski, Michelle Paradowska, Tomasz Drewa, Marta Pokrywczyńska

**Session:** Medical Sciences Session II

#### Introduction:

Bladder cancer is one of the most common malignant tumors among men in Poland. The main reason for a large number of treatment failures is an insufficient effectiveness of currently used chemotherapeutics, that is why a lot of research is focused on finding new, more effective methods. Fluoroquinolones show anticancer properties due to inhibition of topoisomerase II or IV, which leads to the cell cycle arrest and in consequence to cells death. Concerning the anticancer properties of quinolones and their high concentration achievable in urine, they seem to be promising candidates for the bladder cancer treatment.

#### Aim of the study:

Aim of the study was to evaluate and compare the cytotoxic effect of different concentration of ciprofloxacin, norfloxacin, ofloxacin, levofloxacin, moxifloxacin and enrofloxacin on the growth of normal and urinary bladder cancer cells in vitro.

#### Material and methods:

This study was conducted on two human cell lines including human uroepithelium cell line (SV-HUC-1) and urinary bladder cancer cells (T24). Cells were exposed to drugs for 24 and 48 hours at concentrations ranging from 25 to 800 µg/ml. The evaluation of cell viability depending on exposure time and drug concentration was performed using MTT assay, which enables to calculate concentrations reducing cell proliferation by 10, 50 and 90%. Real-time cell analysis using the xCELLigence system was used to confirm results obtained by MTT assay. In order to visualize the changes occurring inside the cells after exposure to the tested drugs, fluorescence staining was performed. Additionally, using flow cytometry techniques, cell cycle and cell death type analyses were performed. The results were subjected to statistical analysis using the GraphPad PRISM 7.

#### Results:

The results of this study indicate that tested fluoroquinolones exhibit cytotoxic properties depending on the concentration of the compound and the incubation time against both tested cell lines. The cancer cells (T24) have been shown to be more sensitive to these drugs than SV-HUC-1 cell ( $p < 0.05$ ). MTT assay showed that the most effective in lower concentration (LC10 and LC50) of the studied fluoroquinolones was ciprofloxacin. Norfloxacin was the most effective in higher doses. Real-time cell analysis confirmed obtained results. Cell cycle analysis showed increase in the number of cells in the G2/M-phase after exposure to all quinolones. High concentrations of tested drugs led to significant increase in late apoptotic and necrotic/dead cells.

#### Conclusions:

Obtained results together with favourable pharmacokinetic parameters of the analyzed quinolones suggest that these drugs, especially ciprofloxacin, can be potentially used in the treatment of bladder cancer.

**Title:** The role of ultrasound examination in the diagnostic of autoimmune thyroiditis

**Authors:** Zavgorodniy Sergey Nikolaevich, Rylov Andrei Ivanovich, Danylyuk Mikhaylo Bogdanovych, Zymnia Kateryna Oleksandrivna

**Session:** Medical Sciences Session II

### Introduction:

Introducion of the thyroid gland is one of the most affordable and safe methods for diagnosing the autoimmune thyroiditis. But it becomes more difficult for patients with only minimally or moderately hypoechogenic pattern. Hypoechogenicity have usually noticed in a euthyroid patient.

### Aim of the study:

To analyze the results of ultrasound diagnostics of thyroid disease in patients with autoimmune thyroiditis and without for evaluation their efficiency in the diagnostic of this disease.

### Material and methods:

A retrospective analysis of 122 histories of patients who have been diagnosed autoimmune thyroiditis during ultrasound exam in the period from 2018 to 2020 year was performed.

### Results:

Patients were divided into two groups according to the results of pathomorphological examination. The 68 (55.7%) patients of whom the diagnosis of autoimmune thyroiditis was confirmed, were included to the first group. The 54 (44.3%) patient, witch whom this diagnose was not confirmed were included to the second group.

Ultrasound examination showed an increase in thyroid size in 29 (42.6%) patients of the first group, and in 21 (38.9%) among the second group,  $U = 1801,0$ ;  $p = 0,8589$ .

Hypoechogenicity and of the thyroid parenchyma was detected more often than in the first group - 54 (78.4%) and 29 (52.7%) patients of the second group had the same changes,  $U = 1364,0$ ;  $p = 0,0151$ . The heterogeneity of the thyroid gland was more often determined in patients of the second group 23 (42.6%) than in the first 10 (14.7%),  $U = 1358,0$ ;  $p = 0,0138$ . The specificity of this indicator in the diagnosis of autoimmune thyroiditis is 57.4%. Hyperechogenicity of the thyroid parenchyma was detected with equal frequency in both groups - 4 (5.9%) and 2 (3.7%),  $U = 1796,0$ ;  $p = 0,8387$ .

Fibrous inclusions were found in 44 (81.5%) patients of the second group, while in the first 40 (58.8%),  $U = 1420,0$ ;  $p = 0,0322$ . The specificity of these changes is 18.5%.

An increase in volumetric blood flow rate was found in only 18 (26,5%) patients in the main group. In the second group, the frequency of detection of this indicator did not differ significantly and was detected in 3 (5.6%) patients,  $U = 1452,0$ ;  $p = 0,0487$ . Estimation of volumetric blood flow rate has a specificity of 94.4%.

### Conclusions:

Ultrasound diagnosis is not effective enough in detecting autoimmune thyroiditis. According to our study, the greatest sensitivity in the diagnosis of this disease is the presence of fibrous changes in the parenchyma of the thyroid gland 58.8%. Estimation of volumetric blood flow velocity makes it possible to rule out the diagnosis of autoimmune thyroiditis on ultrasound examination, with a specificity of 94.4%.





**Title:** Results of surgical treatment of acute cholecystitis in the elderly and senile, depending on the duration of surgical intervention

**Authors:** Danyliuk Mykhailo, Sumyk Yaroslava

**Session:** Medical Sciences Session II

### **Aim of the study:**

To evaluate the results of surgical treatment of elderly and senile patients in emergency abdominal surgery with acute cholecystitis on the background of cholelithiasis, depending on the duration of surgical intervention.

### **Material and methods:**

The basis of our work is the analysis of the results of surgical treatment of elderly and senile patients with acute cholecystitis on the background of cholelithiasis, who were hospitalized in the City Hospital of emergency medical care in 2019. The study included 89 patients aged 60 to 89 years, with an average age of  $69.66 \pm 7.30$ .

### **Results:**

All patients were operated on urgently, the average duration of the preoperative period is 20.00 (7.00; 27.00) hours. Laparoscopic cholecystectomy with abdominal drainage was performed in 70 patients (78.7 %), laparotomy, cholecystectomy with abdominal drainage – 14 (15.7 %). Laparotomy, cholecystectomy with choledochal drainage was performed in 5 patients (5.6 %). In 3 patients (4.3%) with laparoscopic cholecystectomy, conversion was necessary for bleeding from the gallbladder bed.

### **Conclusions:**

Delaying the duration of surgical intervention in elderly and senile patients with acute cholecystitis on the background of GI allows you to stabilize the condition, improve the results of postoperative treatment and reduce the frequency of postoperative complications.

Relief of pain syndrome, stabilization of the cardiovascular and respiratory systems, as well as prevention of thrombotic complications, allow us to expand the indications for applying pneumoperitoneum and performing laparoscopic surgery.

Elderly and senile patients require a more detailed and individual approach to the perioperative period, which determines the need to develop an algorithm for treating these patients.



**Title:** Oral dietary supplements as a potential way of preventing and treating chemotherapy induced peripheral neuropathy

**Authors:** Adam Michalski

**Session:** Medical Sciences Session II

#### **Introduction:**

Chemotherapy induced peripheral neuropathy (CIPN) is a frequent side effect for patients treated with several anti-cancer drugs, that often requires dose-limitation or even stopping the therapy altogether. Usually presents itself as a sensory polyneuropathy with symptoms such as paresthesia, pain or burning sensation. Motor presentation is possible, although less frequent. It is evaluated that around 68.1% of patients will suffer from CIPN during the first month post-chemotherapy with 30% of patients still having symptoms at 6 months and later post-chemotherapy. Currently available treatment options include several antidepressant and anticonvulsant drugs, although their effectiveness is not certain.

#### **Aim of the study:**

The aim of this work is to assess the effectiveness of chosen oral dietary supplements as a potential way to prevent and treat the CIPN.

#### **Material and methods:**

Method used in this work was a review of clinical trials focused on the administration of chosen dietary supplements (acetyl-L-carnitine [ALC], omega-3 fatty acids [O3FA] and vitamin E [VE]) in CIPN.

#### **Results:**

Based on currently available data, VE and O3FA may be effective in preventing CIPN, although prolonged vitamin E administration may considerably increase the risk of a prostate cancer in males. On the other hand, administration of ALC can significantly worsen CIPN when given during chemotherapy. Importantly, the data regarding VE is inconsistent, with some clinical trials indicating its effectiveness and other showing no difference between VE and placebo.

#### **Conclusions:**

Oral administration of VE and O3FA can be a fairly safe and cheap way that could potentially prevent CIPN. Due to the small sample sizes of reviewed clinical trials as well as conflicting data coming from different studies, these findings are unlikely to change the current clinical practice. In order to improve our understanding of the effects of oral dietary supplements as a potential way to prevent or treat CIPN a more complex study involving a bigger cohort of patients are required.





**Title:** Monocytosis as a potential prognostic marker of chronic lymphocytic leukemia

**Authors:** Adam Michalski, Izabela Morawska, Bartosz Twarowski, Michał Zarobkiewicz, Wioleta Kowalska

**Session:** Medical Sciences Session II

### Introduction:

Leukocytosis with lymphocytosis, as well as confirmed presence of clonal CD5+/CD19+ B-cell are among diagnostic criteria of chronic lymphocytic leukemia (CLL). Currently it is suspected that level of peripheral blood monocytes in CLL patients can also serve as a prognostic factor. Interestingly, it was proven that monocyte count in addition to the other prognostic factors can help us to identify patients with high progression risk CLL.

### Aim of the study:

The aim of the study was to assess the value of monocyte count as a prognostic factor in CLL patients at the different stages of the disease.

### Material and methods:

During the study a total monocyte count (thou/ $\mu$ l) was assessed in blood smear performed at the moment of diagnosis in 70 CLL patients and 20 healthy volunteers (HV).

### Results:

Among patients diagnosed with CLL a statistically higher ( $p < 0.01$ ) level of monocytes was discovered, as compared to the HV. Furthermore, a statistically lower level ( $p < 0.05$ ) of monocytes was discovered in Rai 0 stage patients diagnosed with CLL, as compared to the patients in other stages of Rai classification.

### Conclusions:

Patients diagnosed with CLL have higher levels of monocytes than healthy population. Furthermore, it is speculated that monocytes may be involved in the process of progression of the disease, as suggested by the higher values of monocyte count in patients with high progression risk CLL compared to the intermediate and low progression risk CLL.



**Title:** Ophthalmological aspect of pharmacological treatment of erectile dysfunction

**Authors:** Anna Nowak

**Session:** Medical Sciences Session II

### **Introduction:**

Non-Arteritic Anterior Ischemic Optic Neuropathy (NAAION) involves partial or complete infarction of the optic disc associated with the closure of the posterior short ciliary arteries. The symptom of the disease is usually a sudden, painless deterioration of visual acuity. Sildenafil is a drug used to treat erectile dysfunction. Its action is based on smooth muscle relaxation, including vascular muscle leading to vasodilation. In Poland, the drug is available without a prescription and is aggressively advertised.

### **Case study:**

A 57-year-old man presented to the Department of Ophthalmology for sudden, painless blindness in one eye. In the medical history, the patient reported that he was being treated for hypertension and denied taking medication for other diseases. Based on the patient's history and ophthalmologic examination, visual field, OCT and AF, a diagnosis of NAAION was established. During the in-depth interview, the patient added that he had recently used sildenafil due to erectile dysfunction.

### **Conclusions:**

Disease pattern, examination findings, presence of systemic disease, and anatomical conditions of the optic disc led to the diagnosis of NAAION, and a review of the literature identified sildenafil as a legitimate additional risk factor for NAAION. This case report is intended to point out that an extended interdisciplinary medical history in an atmosphere of respect and trust allows the collection of additional information useful for establishing the correct diagnosis.



**Title:** Evaluation of stereoscopic vision among dentistry students and its consequences

**Authors:** Anna Nowak

**Session:** Medical Sciences Session II

### 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.

### Material 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 arc, 90% in 200 seconds of arc, 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.



**Title:** Lung transplantation as a viable treatment option in patients with pulmonary vein stenosis – case report

**Authors:** Dagmara Galle, Kornelia Niepokój, Martyna Gawęda, Anastazja Pandel, Klaudia Nowak, Kaja Pelar

**Session:** Medical Sciences Session III

#### **Introduction:**

Pulmonary vein stenosis (PVS) is a very rare vascular malformation that is associated with significant mortality. The disease used to be seen almost exclusively in children. Survival to maturity is very rare due to the progression of pulmonary hypertension, which is associated with worsening cardiac conditions. That is why in the adult population it is even more infrequent and has been reported rarely in previously unoperated adult patients.

#### **Case study:**

The case describes a 49-years old female patient with pulmonary hypertension in the course of primary pulmonary veins stenosis and hypoplasia of the pulmonary veins. Congenital malformations in the form of pulmonary arteries and veins stenosis of the right lung were accompanied by its poor vascularization (pulmonary infarctions) and abnormalities of venous structures of the left lung. The patient complained of dyspnoea, orthopnoea, chest pain during physical activity and hand edema that indicated class III heart failure (NYHA III). Echocardiography also showed right ventricular volume overload. In previous years, the patient has received two successful balloon angioplasties of upper and lower left pulmonary veins. However, further procedures were necessary and conducted but failed due to vessel damage and blood extravasation to the lung tissue. Because of the fragility of the vessels, further attempts were abandoned. Subsequently, the patient developed end-stage respiratory failure in the course of pulmonary hypertension. For this reason, it was decided to introduce a new treatment method and after 139 days the patient underwent double lung transplantation (LTx). It was the only fully curative therapy for this entity. Bilateral sequential lung transplantation was performed with the use of veno-arterial extracorporeal membrane oxygenation (ECMO). ECMO was discontinued 4 days after the procedure. Results of the 6-minute walk test improved from 73,7 m at the qualification process - to 480,7 m 10 months after the LTx. Currently, the patient is in good general condition with full respiratory efficiency.

#### **Conclusions:**

In infrequent diseases such as PVS, there are no medical procedures that guarantee a full recovery. Bridging methods play an important role in the treatment plan, but in some cases LTx is the only therapeutic option, which has good long-term clinical results in the patient.

**Title:** The potential influence of potassium metabisulfite on tumor growth and cell viability in non-small-cell lung cancer

**Authors:** Dawid Lewko

**Session:** Medical Sciences Session III

### Introduction:

Most of lung cancers are non-small-cell lung cancer (NSCLC). This life-threatening malignancy causes high mortality, therefore positive results of researches related to the assessment of inhibition of its growth would give huge possibilities for patients with cancers and new opportunities of therapies. In the presented study, the effects of potassium metabisulfite on NSCLC cells were evaluated.

### Aim of the study:

The aim of the study was to investigate the potential influence of potassium metabisulfite on the viability of cancer cell line A549.

### Material and methods:

A549 cells were purchased from the American Type Culture Collection. The cells were grown in F-12K Medium supplemented with 10% heat-inactivated fetal bovine serum, FBS, 50 units/ml penicillin and 50 µg/ml streptomycin. Cells were cultured at 37°C in 5% CO<sub>2</sub>. MTT assay was employed to determine IC<sub>50</sub> of potassium metabisulfite - the cells were incubated with potassium metabisulfite for 24 hours. The cells of line A549 were prepared to the cytotoxicity assay detecting the apoptosis by the flow cytometry using ready-made Annexin V-FITC Apoptosis Detection Kits. The impact of particular potassium metabisulfite concentrations on the tested cancer cells (10 mM; 5 mM; 2.5 mM; 1 mM and 0.5 mM respectively) has been assessed. After 24-hour incubation with selected concentrations, the cells were washed twice in DPBS and resuspended in Binding Buffer at a concentration of about 1x10<sup>6</sup> cells/ml. Then 5 µl of Annexin V FITC Conjugate and 10 µl of Propidium Iodide Solution were added to the test tubes with 500 µl of the apoptotic and non-induced cell suspension. Apoptosis was induced by the addition of 1 µg/ml staurosporine for 3 hours as a positive control. Protein expression (Caspase-3) were demonstrated using western blot analysis.

### Results:

The results demonstrated that at a concentration of 5 mM of potassium metabisulfite, cell viability of lung cancer is inhibited in around 50%. Moreover, concentration of potassium metabisulfite over 0,5 mM induced apoptosis in cancer cell lines A549.

### Conclusions:

Potassium metabisulfite possess the potential to inhibit the viability of non-small-cell lung cancer.

**Title:** Rare malignancy in a 55 year old male suffering from abdominal pain – peritoneal mesothelioma (case report)

**Authors:** Karol Śliwa

**Session:** Medical Sciences Session III

### Introduction:

Peritoneal mesothelioma is an example of rare malignancies of serous membranes. It accounts for 7-30 % of all mesotheliomas. These malignancies are often linked to exposure to toxic pollutants, especially asbestos. Peritoneum is the second most common site where mesotheliomas can be found, just after the pleura. Patients with this type of peritoneal malignancy are often presented with abdominal pain and ascites. In many cases diagnosis is delayed due to the nonspecific nature of these symptoms. It takes many tests to accurately diagnose the patients. They may include the evaluation of the tumor markers levels and radiological tests. Nowadays the mainstay of treatment is cytoreductive surgery with heated intraperitoneal chemotherapy, but still new therapies are being developed.

### Case study:

55 year old patient with abdominal pain, ascites and elevated level of C-reactive protein was admitted to the Department of General, Minimally Invasive and Elderly Surgery in Olsztyn. The patient didn't have a fever. He was treated with the empirical antibiotic therapy. After conducting laboratory and radiological tests, which had come back showing elevated level of CEA and nonspecific changes in the abdominal cavity and pelvis, exploratory laparoscopy was performed. It showed high amount of free fluid in the peritoneal cavity. Together approximately 4 l. of murky fluid was evacuated. A large tumor in the hypogastric region as well as the neoplastic, nodular spread in the anterior peritoneum were identified. Small pieces of the diffuse, cancerous changes were dissected for further histopathological evaluation, which showed it's peritoneal mesothelioma. There were no post-op complications and the patient was discharged in a good condition.

### Conclusions:

The diagnostic process of peritoneal mesothelioma can be very challenging, both for a patient and the doctors. Patient's complains may be nonspecific. They can also vary in different groups of patients. But it's essential to evaluate them correctly. This can dramatically increase patient's chance of survival and the lifespan as well as the quality of life. This is also really important considering new methods of treating patients.





**Title:** Heart transplantations in the era of the COVID-19 pandemic - a single-center study

**Authors:** Kornelia Niepokój, Dagmara Galle, Kaja Pelar, Paweł Sybila, Anastazja Pandel, Martyna Gawęda

**Session:** Medical Sciences Session III

#### Introduction:

The COVID-19 pandemic caused by SARS-CoV-2 has significantly affected the delivery of medical care across all specialties, therefore, it is not a surprise that the number of heart transplantations (HTx) has drastically diminished worldwide during the pandemic. This has led to a situation, in which patients with end-stage heart failure find themselves in an even more difficult position, where being on the transplantation-waiting list is even longer.

#### Aim of the study:

The aim of the study was to examine how COVID-19 pandemic has impacted the number and outcomes of heart transplantations performed at the Silesian Center for Heart Diseases in Zabrze.

#### Material and methods:

Patients qualified for HTx underwent a series of tests examining the indication for transplantation and assessing the safety of the procedure by a multidisciplinary team. From March 2020 to March 2021, 96 patients underwent orthotopic HTx. The age range was 33-66 yrs, and a median of 54 yr. Both donor and recipient were tested for SARS-CoV-2 within 48 hrs before the procedure and none were positive. All recipients were regularly tested following the procedure and also none were positive.

#### Results:

Fifty-three patients (55,2%) with INTERMACS 4 class have been treated, 31 patients (32,3%) with INTERMACS 3 and 11 patients (11,5%) with INTERMACS 2. Only one patient (1,0%) with INTERMACS 1 underwent HTx. Six patients (6,3%) died within the first 30 days following HTx. After the HTx all recipients were treated with standard immunosuppression protocol and were regularly tested during planned admissions to the ward. The outcome was assessed based on biopsy and the presence of renal failure after the HTx. Rejection at first biopsy occurred in 16 patients (17,8%). Renal failure presented in stage G3a in 17 patients (18,9%), in stage G3b in 7 patients (7,8%), and in stage G4 in 3 patients (3,3%) within the first 10 days after HTx. Seventy percent of patients have never experienced transient worsening of kidney function. Moreover, we checked whether the number of COVID-19 cases in Poland had an impact on the number of performed HTx. The analysis showed a statistically significant and strongly negative correlation between the examined parameters. With more new cases found - the less transplantations monthly were performed. Fortunately, the number of total transplantations performed in our facility increased by 37%, while the number of heart transplantations in Poland did not change compared to the previous year.

#### Conclusions:

By creating a robust system of care based on teamwork, early testing, and re-testing of patients and staff for SARS-CoV-2 - we were able to demonstrate that HTx in the era of the COVID-19 pandemic can be performed safely and without worsening the outcomes of HTx procedures.



**Title:** A new organoid model of adipose tissue culture \*

**Authors:** Krzysztof Drygalski, Kamil Grubczak, Hady Razak Hady, Katarzyna Siewko, Adam Krętowski

**Session:** Medical Sciences Session III

### Introduction:

The increasing rate of obesity and obesity-related diseases, within modern societies, forced an astonishing growth in the number of conducted research in the field of energy metabolism and insulin sensitivity in the last two decades. One of the major organs involved in the pathogenesis of obesity and its aftermaths is adipose tissue. However, so far there was neither no research model that would allow to study mature white adipocytes in a long period nor a method preserving real tissue structure.

### Aim of the study:

The aim of the study was to develop a complex, three dimensional model of adipose tissue which could be used in physiological, pathophysiological and pharmaceutical research. A model that, in contrast to 3T3-L1 or MSCs derived models, preserves tissue architecture, cell-ECM interactions and contains both mature white adipocytes, as well as, all the stroma vascular cells naturally occurring in adipose tissue.

### Material and methods:

In our study we developed a brand new method of ex vivo adipose tissue slice culture creating an organoid model which could be used in metabolic research. Briefly, the subcutaneous adipose tissue was obtained from 24 patients undergoing surgery for clinical reasons. Most of them underwent laparoscopic sleeve gastrectomy due to morbid obesity or abdominoplasty after significant weight loss. During the surgery tissue fragments were placed in ice-cold PBS buffer and immediately transported to the laboratory where they were trimmed to and embedded in agarose. Subsequently, the agarose blocks were cut on a Leica VT1200S vibrating microtome and the slices were placed in a culture medium. During the study we assessed the cell survival and morphological changes in 10 different media in time. To assess the cell viability slices were stained with propidium iodide, Calcein-AM and DAPI in different time points. Moreover, to assess the usability and stability of this organoid model a response to physiological stimuli of insulin and isoprenaline were analysed on day 0 and day 3. In insulin test slices were incubated with the addition of 100nM insulin (NovoRapid) for 20 min. Subsequently, the slices were fixed and prepared for immunofluorescence staining for insulin-dependent transporters: FAT/CD36 and GLUT-4. In the glycerol release test slices were incubated with 10µM of isoprenaline for 2h. Once completed, the glycerol concentration in media was assessed.

### Results:

The conducted experiments allowed us to optimise the culture conditions, confocal imaging and preparation of 3D tissue reconstructions. The study showed that adipose tissue organoid can remain vital in ex vivo culture, preserve structural integrity, stable protein expression and response to physiological stimuli.

### Conclusions:

The research showed that ex vivo adipose tissue slice culture might be a new, useful tool in metabolic research.

\* Research work financed from the budget for science in 2019-2022, as a research project under the "Diamond Grant" program.

**Title:** The child with joint and muscles pain in pediatric emergency department

**Authors:** Małgorzata Drozd, Adrianna Gorecka, Bartłomiej Zaremba

**Session:** Medical Sciences Session III

### Introduction:

Musculoskeletal pain in children is a common reason for visits to the emergency department. It may be a symptom of benign and self-resolving musculoskeletal conditions or more severe diseases, such as leukemia or malignancy. The differential diagnosis is large including some diseases that do not primarily affect the locomotor system.

### Aim of the study:

The aim of the study was to analyze the diagnostic approach to a child with musculoskeletal pain.

### Material and methods:

We have retrospectively analyzed the clinical data of 498 pediatric patients admitted to The Emergency Department (ED) of University Children's Hospital in Lublin, in 2018-2020. The inclusion criteria were initial diagnosis of muscle pain, nonspecific arthritis, limb or back pain and no prior consultation with the family doctor. The exclusion criterion was the final diagnosis associated with injuries of the musculoskeletal system.

### Results:

Musculoskeletal pain was the reason of 0,48% visits to ED. Majority of patients presented acute, non-trauma related, single-site pain, usually localized in the hip, the knee and the spine. 107 patients (21,49%) were referred to a hospital ward, usually rheumatological, neurological or orthopedic. In 71,96% of these patients the final diagnoses at the hospital ward were diseases from the group of the musculoskeletal system and connective tissue, the most frequently - nonspecified arthritis, muscle pain or other reactive arthropathies. Musculoskeletal pain was also the symptom of infectious or parasitic diseases or nervous system disorders, among others. Elevated leukocytes levels occurred in 29,91% of patients with indication to hospitalization vs. 18,41% of patients without indication to hospitalization; elevated neutrophils levels – 19,63% vs. 8,44%; erythrocyte sedimentation rate (ESR) – 7,48% vs. 0,51%, C-reactive protein (CRP) – 16,82% vs. 2,55% and creatine kinase (CK) – 12,15% vs. 2,81%. Analogically, plain radiography revealed pathological changes in 44% vs. 29,78%, ultrasonography – in 64% vs. 59,03%. 18,07% of patients did not have any tests ordered, out of which one-third were admitted to certain hospital wards and had proper tests conducted afterwards.

### Conclusions:

Our observation can help in planning care for a child with musculoskeletal pain. Along with medical history and physical examination, laboratory and imaging tests, although not mandatory, aid in distinction between benign and severe conditions.



**Title:** Asymptomatic bladder leiomyoma in 58-year-old female: A case report

**Authors:** Maria Derkaczew

**Session:** Medical Sciences Session III

### Introduction:

Leiomyoma is a common benign tumor generally located in the uterus. The occurrence of leiomyoma in the bladder is quite a rare phenomenon, although it is the most common benign mesenchymal neoplasm of this organ, estimated at about <0,5% of all bladder tumors. Leiomyomas are asymptomatic in approximately 20% of cases. Symptomatic patients often complain about lower urinary tract symptoms (LUTS) or irritative symptoms. Complete tumor removal is the best therapeutic method, which gives good results.

### Case study:

A 58-year-old female was admitted to the urology department due to the incidental finding of a 1,5 cm diameter bladder tumor during routine ultrasound examination. The patient had no symptoms and the test results were normal. Cystoscopy has shown protruding part of the mucosa length about 15 mm near the left ureteric orifice. Tumor had the form of a moveable submucosal mass. The patient underwent En-bloc transurethral resection of bladder tumor (TURBT) with a complete removal of leiomyoma. Operation time was 15 minutes and patient was discharged 8 hours after procedure.

### Conclusions:

Leiomyoma is a rare finding in bladder, but with very characteristic cystoscopic view. Fortunately, this is a benign neoplasm and properly performed excision of this lesion gives satisfactory results. In this case leiomyoma was asymptomatic, which can be related to the location and size of the tumor. Masses localized close to the bladder neck or with significantly larger size can cause urgency or pain. TURBT is the gold standard of treatment because of the minimal invasiveness and the best cosmetic effect. However in cases of larger tumors is worth to consider laparoscopy or perform TURBT with the defragmentation or morcellation.



**Title:** Recurrent Kawasaki disease with gallbladder hydrops – case report

**Authors:** Paulina Frączek

**Session:** Medical Sciences Session III

#### **Introduction:**

Kawasaki disease is an acute systemic vasculitis with predominant incidence in children up to 5 years of age. Its etiology is not fully understood. The diagnosis is based on typical clinical features. It is a self-limiting inflammatory illness, however its major complications concern coronary artery dilatation and aneurysm, making proper assessment significant. Inflammation process affects many systems, causing possible gastrointestinal manifestation including gallbladder hydrops and cholestasis. It has been noted that abdominal involvement of the disease predisposes to IVIG resistance and coronary complications. Recurrence of Kawasaki disease is possible, and according to literature, the second episode is more likely to occur in patients presenting gastrointestinal manifestation of the disease.

#### **Case study:**

Presented report shows a 9-year-old patient with this non-typical clinical picture of Kawasaki disease - dominant abdominal pain and fever. In physical examination he had maculopapular rash with predominant intensification on trunk and peeling skin on face and eyelids. Erythema of oral cavity and lips with "strawberry tongue" as a mucositis sign were also observed. Abdominal ultrasonography and CT showed enlarged liver, distended, thin-walled gallbladder filled with hypodense bile and edema of biliary ducts, suggesting a gastrointestinal, cholestatic manifestation of Kawasaki disease. Four days after admission, ultrasonography revealed a massive hydrops of gallbladder. the patient received intravenous immunoglobulin (IVIG) with ASA (acetylsalicylic acid), repeated after 48 hours due to limited improvement. After 3 weeks of hospitalization, the patient in stable condition was discharged. After two weeks, the patient was admitted to the pediatric unit again for control tests. He complained on abdominal pain in the right upper quadrant. Overall clinical assessment led to diagnosis of exacerbation of Kawasaki disease with gastrointestinal manifestation.

#### **Conclusions:**

Kawasaki disease also known as mucocutaneous lymph node syndrome, is a multisystem vasculitis primarily affecting coronary arteries in children. The course of Kawasaki disease may differ. Not all typical symptoms listed in KD criteria are present in every child. According to studies, there is possibility of a non-typical manifestation of KD including neural, gastrointestinal, hepatobiliary and others. High dose IVIG and ASA are leading treatment line and if the patient is still febrile 36 to 48 hours after the first IVIG dose, then the dose should be repeated once. According to literature, individuals at risk for IVIG resistance and development of CAA (coronary artery aneurysm) include those with gastrointestinal/abdominal involvement. The pattern of recurrence as well as positive correlation between aneurysm and recurrence of KD should be a ground for careful assessment of patients with the first episode of Kawasaki disease.



**Title:** Congenital defect syndrome with duodenal obstruction – four times a charm

**Authors:** Paweł Bednarek, Kacper Michalski, Agnieszka Mucha

**Session:** Medical Sciences Session III

#### Introduction:

Duodenum is the most common place for congenital gastrointestinal tract atresia. It occurs in 1 infant per 10,000 births. It co-occurs with other anomalies really often (40-60% with Down Syndrome, 50% with heart congenital anomaly). Because of a lack of intestinal passage, during pregnancy we find an excess of amniotic fluid in amniotic sac. Early treatment is removing fluid from the stomach by nasogastric tube and parenteral nutrition. Surgery is compulsory to provide normal intestinal passage and effective oral nutrition.

#### Case study:

A girl was born in December 2020 in University Hospital in Zielona Gora, at 35 weeks of pregnancy because of preeclampsia. She rated on 1/6/6/6 in 1st, 3rd, 5th, 10th minute of life in Apgar scale. Her body mass was 1580 grams. In the first examination several defects were detected: malformation of the humerus, forearm and lack of fingers in the hand, cleft lip and palate, dextrocardia, anorectal malformation. Defects of limbs were detected prenatally in the 14th week of pregnancy. She presented signs of gastrointestinal signs obstruction. Laparotomy was performed and atresia of duodenum type II was discovered. Duodenoduodenal diamond-shaped anastomosis was carried out. The patient still had difficulties with swallowing and signs of gastrointestinal tract obstruction were observed. Relaparotomy after 12 days was conducted during which anastomosis was checked out, many adhesions were cut and gastrostomy was implied, but the GI tract was still occluded. Greenish substance was found in a gastric probe. Another laparotomy was performed to create Roux-en-Y gastrojejunal bypass. In the following days, the patient was still vomiting up a greenish substance and her condition was getting worse. After 11 days the next, fourth laparotomy was carried out and the old anastomosis was sewed wider into the stomach again. Also Nissen fundoplication was performed. After this operation, massive dermatitis caused by staphylococci was observed and broad-spectrum antibiotics with local treatment was applied. Progressive local and overall recovery was noticed. Oral feeding was applied gradually, the child tolerated it well without further vomitings and defecated normally. The skin was cured completely. The child was discharged from the hospital.

#### Conclusions:

Surgical treatment of children with many birth defects may be associated with numerous complications and could create more problems. Sometimes methods appropriate for another age group of patients should be used. Roux-en-y surgery in this case was an effective method, even if it is not dedicated to this kind of patient.





**Title:** Socio-economic condition, life style, occupational Behavior of the sanitation worker in the selected area of old Dhaka city, Bangladesh

**Authors:** Ashish Paul

**Session:** Medical Sciences Session III

#### **Introduction:**

Sanitation workers play an important role in maintaining the health- hygiene in the communities. Aim: The aim of this study is to find out socio-economic condition, lifestyle, common health problems , occupational behavior of the sanitary workers.

#### **Material and methods:**

This was a cross sectional type of descriptive study .149 respondents were selected and data was collected from them by Face to face interview. The sampling technique was Convenient type of non -probability sampling . Structural questionnaire was used as research instrument .Graphical presentation (pie chart), tables were applied and analyzed by SPSS 20 programme.

#### **Results:**

Among the total respondents 145(97.3%)were sweeper and 4 were scavenges.67 (45%) were literate .124 lived in Semi Paccya house . 15(10.07%) had sore throat,21(14.09%) had cough,9(6%) had breathlessness and 16(10.74%) had chest tightness.7 ( 20%) had lacrimation ,15(42.9%) had redness of eye,13(37.1%) had itching problem in eye. 7 (4.10%) had abdominal pain and 2(1.03%) had diarrhea. 92(61.74%) had musculoskeletal pain. 43(46.7%) had leg pain,37(40.2%) had back pain. 31(20.81%) had knowledge about personal protection equipment, 12(37.50%) used mask,8(25%) used hand gloves. 7(4.70%) had a regular health checkup . 51(46.36%) had a habit of taking betel nut ,31(28.18%) took cigarette, 27(24.55%) took gul and 1(0.91%) took tobacco.

#### **Conclusions:**

The occupational health hazards, the knowledge and attitude about the health conditions and occupation, socio-economic condition, lifestyle of the sanitation workers are not satisfactory.



**Title:** Is there any solution? - a case report of the paediatric patient with recurrent meningitis.

**Authors:** Julia Bilska, Aleksandra Jędrasek, Szymon Bernard

**Session:** Medical Sciences Session III

### Introduction:

Recurrent bacterial meningitis (RBM) is defined as two or more episodes of bacterial meningitis with at least 3-week interval after the completion of therapy for the initial episode, or any interval if caused by different bacteria. A common risk factor for RBM in young age is anatomical abnormalities in the skull - both congenital and acquired, as presented in our case.

### Case study:

We describe the case of the girl with the history of a head trauma, which caused RBM. When she was 10 months old, she fell out of bed and suffered a head trauma. Then, her parents observed a nose fluid leakage that they did not associate with the accident. After 4 months, the girl was admitted to the Department of Paediatric Neurosurgery. Two days prior a myringotomy followed by fluid leakage from the right ear caused a rapid deterioration of health. Ultimately, the girl was diagnosed with meningitis, rhinorrhoea and otorrhoea.

No indisputable cerebrospinal fluid leakage was observed in the imaging studies. Nevertheless, the osteoplastic craniotomy in the right parieto-temporal area was performed. The suspected spot of the fluid leakage was filled with Neuro-patch and tissue glue. On the 2nd postoperative day, paresis of the right facial nerve appeared. Rhinorrhoea and otorrhoea were still present. During the hospitalization, meningitis recurred twice more. It resolved quickly after antibiotic therapy.

Subsequent episodes of RBM occurred at the age of 5, 8 and 10. Afterwards, vaccination against pneumococci and meningococci was recommended by doctors and administered to the girl at the age of 10. Currently, the patient is 23 years old and no further relapses of meningitis have been observed.

At the age of 5, audiometric tests were performed. The results indicated profound sensorineural hearing loss in the right ear that could be caused by head trauma, meningitis or neurosurgical operation. There was no progression of the hearing loss in follow-up examinations.

### Conclusions:

Our case highlights that head trauma is a crucial risk factor of RBM. Therefore, it is essential to ask parents about child's major traumatic events from several years ago. Moreover, it is important to inform them about rhinorrhoea as a symptom of head trauma.

The presented case indicates the high vaccine efficacy against contagious diseases. Therefore, parents should be encouraged to have prophylactic vaccination administered for their children. Sometimes it may be crucial for saving their life.



**Title:** Ocular manifestation and complications in the patients with COVID-19

**Authors:** Maciej Sobczyk, Katarzyna Słowińska, Natalia Sergiel

**Session:** Medical Sciences Session III

#### **Introduction:**

The COVID-19 is the contagious disease, which is caused by the SARS-CoV-2. The SARS-CoV-2 is the new coronavirus, which is responsible for the global pandemic. It was discovered in the end of year 2019. The virus is causing mostly pneumonia and is droplet-transmitted. As a result of the increasing number of SARS-CoV-2 infections and the duration of the pandemic, new symptoms of the disease are observed. One of them is ocular manifestation.

The main receptor for SARS-CoV-2 is Angiotensin-converting enzyme 2. It is present in alveolar lung cells type 2, cells in small intestine. It has been identified in human cornea, conjunctival epithelium, retina, retinal pigment epithelium and choroid.

#### **Aim of the study:**

The aim of the study is to emphasize the ocular manifestation and complications of the COVID-19. In this case we analysed available articles about COVID-19 and ocular manifestation.

#### **Material and methods:**

A search was conducted in the PubMed database. The keywords were "covid-19" "ocular manifestation", "eyes", "complications", "ocular".

#### **Results:**

Reported ocular manifestations of COVID-19 have been rare so far. However ocular manifestation correlated with the severity of the disease. Conjunctivitis can be the first symptom in patients with SARS-CoV-2 infection. The virus can be present in tear and conjunctival secretions. The most common features were bilateral conjunctival hyperemia, epiphora, and foreign body sensation, followed by itching, lid swelling, and mucopurulent discharge. One of the ocular complications that has been described is opportunistic candida retinitis in the patient with hypertension and diabetes mellitus.

#### **Conclusions:**

The COVID-19 pandemic is one of the most important problem for society nowadays. It is essential to know the course of the disease, possible symptoms and complications. The symptoms of ocular SARS-CoV-2 infection are non-specific and similar to other viral infections. Due to non-specific symptoms, patients may be misdiagnosed and their symptoms may be underestimated. The complications can be serious if the patient have comorbidity.



**iMEDIC 2021 | Bydgoszcz**

**5<sup>th</sup> International Medical  
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## **Pharmaceutical Sciences Block**

**Jury:**

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dr hab. Krzysztof Skowron, prof. UMK

dr hab. Tomasz Dziaman, prof. UMK

**Moderator:**

Hanna Bednarek

Maja Kozdrój

**Title:** Relationship between structure and antimicrobial activity of novel quaternary imidazolium salts

**Authors:** Kamil Szupryczyński, Maciej Karolak, Andrzej Skrzypczak, Łukasz Pałkowski

**Session:** Pharmaceutical Sciences Session

### Introduction:

Quaternary ammonium salts (QAS), as the antimicrobial and surface active compounds, are widely used in medicine and industry. These compounds are applied in cosmetology (as ingredients of hair care products), agriculture (as fungicides, pesticides, insecticides), healthcare (as medications), and chemical industry (as biocides, fabric softeners, corrosion inhibitors). Their common application is responsible for the development of microbial resistance to QAS. To overcome this issue novel compounds, including mono and gemini-type ones, are still developed.

The mono compounds consist of the hydrophilic part, containing quaternary nitrogen atom and the hydrophobic part, mainly a long alkyl chain. Gemini QAS are built of two identical parts, connected by an alkyl linker. Cations are responsible for surface activity and adsorption on the surface of microbial cells, which causes a disorder of the structure of cell membranes and leads to their damage.

### Aim of the study:

This study investigates antibacterial and antifungal activity of newly obtained mono and dimeric quaternary imidazolium salts and provides insight into the relationship between their structure and activity.

### Material and methods:

In the study, a group of 47 compounds, divided into four series (mono and gemini-imidazolium) was tested for the bacteriostatic properties, by determining the Minimum Inhibitory Concentration (MIC) according to CLSI guidelines, against *Staphylococcus aureus* ATCC 25923 (SAU) (Gram-positive bacteria), *Pseudomonas aeruginosa* ATCC 27853 (PAE) (Gram-negative bacteria) and *Candida albicans* ATCC 90028 (CAL) (Fungi). Obtained data was compared between compounds in a given homologous series as well as between series, regarding differences between length of alkyl linkers.

### Results:

Our analysis showed that the newly obtained quaternary imidazolium salts presented substantial antimicrobial activity, particularly against Gram-positive bacteria and fungi strains. A relationship between the number of carbon atoms in the chain and the antimicrobial activity of the tested compounds was also observed. Elongation of the alkyl chain connecting imidazolium and phenyl group increased the antimicrobial activity. Moreover, dimeric compounds exhibited lower MIC values than their monomeric counterparts. These relationships were observed in all studied series.

Tested compounds presented a comparable activity to commonly used biocides from QAS group - benzalkonium chloride, and didcyldimethylammonium chloride. We conclude that longer alkyl linker increases antimicrobial activity but all compounds require further investigation.

**Title:** Regulation of food intake and the meaning of peptides in eating Disorders

**Authors:** Sylwia Zawiaślak, Joanna Listos

**Session:** Pharmaceutical Sciences Session

### Introduction:

The hypothalamus is a structure in brain, that connects behavior, hormonal and autonomic reactions using inlet and outlet paths from brainstem and peripheral organs, taking part in f.e. hunger regulation. Signals that hypothalamus gets, come from different organs such as liver, adipose, muscles, pancreas or intestines. They send hormonal and neuronal information. The most important structure that integrates these signals is an arcuate nucleus. All disturbances and dysfunctions in proper information processing, lead to eating disorders like obesity or malnutrition.

An information about feeding state is dependent on orexigenic and anorexigenic peptide signals coming from gastrointestinal tract. The orexigenic stimulation increases hunger. To this group of neurons we include neuropeptide Y, agouti-related peptide, which initiate food intake and decrease spending energy in term of hunger. In contrast to the orexigenic stimulation, the anorexigenic system exists. It is composed of POMC/CART neurons which release of proopiomelanocortin (POMC),  $\alpha$ -melanocyte-stimulating hormone ( $\alpha$ -MSH) and cocaine- and amphetamine- regulated transcript peptide (CART). Stimulation of the anorexigenic neurons inhibits the food intake and increases spending extra energy if there is some.

### Aim of the study:

Orexigenic and anorexigenic systems are stimulated by lots of peptides from digestive tract. The purpose of that presentation is the overview of the role of three peptides involved in the hypothalamic activity, such as: insulin, ghrelin and glucagon-like peptide 1 (GLP-1). Insulin and GLP-1 provoke anorexigenic stimulation, which inhibits food intake. Ghrelin works antagonistically for them and stimulates orexigenic system. It increases hunger and food intake. The role of these peptides will be confronted in the light of current literature data.

### Material and methods:

The following review paper was based on a database found on PubMed.

### Results:

According to our research, concentration of ghrelin, insulin and GLP-1 depend on a few factors. It changes in terms on body weight, energy balance or taken meals. Moreover there is a correlation between this peptides levels and eating disorders.

### Conclusions:

The analysis of these data brings us to conclusion that this peptides may be involved in the weight changes and that patients with eating disorders may have different reactions on this factors. There are assumptions that this peptides may have an impact in pathology of eating disorders.



**Title:** Preparation of alternative 3D printed thin-film microextraction (TFME) supports

**Authors:** Dominika Kołodziej, Łukasz Sobczak, Krzysztof Goryński

**Session:** Pharmaceutical Sciences Session

#### Introduction:

Until recently, no materials compatible with regular 3D printers were able to withstand strict stability demands, preventing implementation of 3D printing into preparation of microextraction devices. Now, few of the lately introduced thermoplastic filaments were selected to achieve this goal, based on their excellent chemical resistance and high heat deflection temperature. These characteristics enabled application of thin-film microextraction (TFME) coatings, with drying temperature of at least 110°C.

#### Aim of the study:

This study presents, for the first time, implementation of 3D printing to create inexpensive and easy to prepare alternative for costly metal supports, currently used for application of TFME coatings.

#### Material and methods:

Different materials (metal, and 3D printed thermoplastics) were compared as supports for TFME coatings prepared with polar end-capped C18-bonded silica particles. Moreover, adsorption to the elements such as non-coated supports and polyacrylonitrile (biocompatible particle binder) were investigated. All microextraction devices were evaluated by extraction of 38 diverse small molecules (with logP range of 0.2–7.2) from oral fluid. Extracted samples were analysed with high performance liquid chromatography coupled to tandem mass spectrometry (HPLC-MS/MS).

#### Results:

Supports prepared with 3D printing method were demonstrated as equivalent to conventionally used metal supports, with average differences in extraction efficacies as low as 3.96% (n=38). Simultaneously, matrix effects recorded for the compared devices, prepared with alternative supports, were not significant – that is always below  $\pm 20\%$  (n=20). In addition, the influence of support materials, as well as polyacrylonitrile adhesive, were determined as marginal for the overall extraction process efficacy – with most of the recorded values below limit of quantification.

#### Conclusions:

Presented study demonstrates benefits associated with implementation of 3D printing into preparation of TFME supports, such as chemicals-free preparation protocol characterized by significant cost reduction.





**Title:** Advances in microextraction sample preparation methods – recent developments and appealing perspectives for the future

**Authors:** Łukasz Sobczak, Dominika Kołodziej, Krzysztof Goryński

**Session:** Pharmaceutical Sciences Session

#### Introduction:

Solid phase microextraction (SPME) was first introduced as sample preparation method used in conjugation with gas chromatography. However with extensive development, SPME became highly versatile and adaptable to the demands of other leading instrumental methods such as liquid chromatography, capillary electrophoresis, or direct coupling with the detectors themselves. Today, with the method already being well esteemed and highly regarded, full potential of microextraction-based sample preparation is still yet to be unleashed. Especially with instrumentation other than gas chromatography. As was already noted by several other authors, limited selection of commercially available stationary phases hinders further implementation of SPME use in conjugation with the omnipresent liquid chromatography [1,2].

#### Aim of the study:

This work intends to showcase the benefits of microextraction-based sample preparation methods and encourage their further popularisation by presenting important findings resulting from multiple research projects realized by the Bioanalysis Scientific Group of Collegium Medicum in Bydgoszcz.

#### Material and methods:

Core of the research was conducted with a use of self-prepared prototypes of thin-film microextraction devices (TFME) in blades format. TFME devices were evaluated by extracting a broad panel of model small molecules characterised with diverse chemical properties, from various aqueous samples (including phosphate-buffered saline (PBS), oral fluid, plasma, and urine). All resulting extracts were analysed with high-performance liquid chromatography coupled with tandem mass spectrometry (HPLC-MS/MS) on the Shimadzu LCMS-8060 Triple Quadrupole instrument operated in reversed-phase gradient elution mode.

#### Results:

Scope of presented results ranges from optimization of stationary phases (including selection of the most effective functional group ligands, end capping chemistries, or particles' sizes), through improvements in extraction protocols, to the novel solutions used in preparation of device formats and support materials.

#### Conclusions:

Presented study shows advances in numerous aspects of microextraction sample preparation methods, that can readily be implemented into preparation of future SPME/TFME devices. Improvements, especially concerning method efficacy, should result in reduction of necessary sample volume, decreasing both laboratory waste production, and organic solvent consumption. In addition, new directions for the development of microextraction-based methods are outlined.



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Medical, Pharmaceutical and Health Sciences

5<sup>th</sup> June | Bydgoszcz, Poland

## Health Sciences Block

### **Jury:**

Anna Pyszora, PhD

Szwed Krzysztof, PhD

### **Moderator:**

Eliza Oleksy

Paulina Kasperska

**Title:** Lifestyle is important, i.e. the phenomenon of overweight and obesity among independent seniors from Bydgoszcz and its vicinity

**Authors:** Jakub Husejko, Aleksandra Piotrowska, Aleksandra Modlińska, Hanna Bednarek, Oliwia Jarosz, Kornelia Kędziora-Kornatowska

**Session:** Health Sciences Session I

**Introduction:** The aging of the organism causes irreversible changes in the course of metabolic processes, the clinical manifestation of which, in the elderly, is often overweight or obesity. However, the occurrence of this type of disorder is influenced not only by the aging process itself, but most of all by the lifestyle and its physical activity and eating habits. Due to the fact that overweight and obesity predispose to a number of complications that may become a threat to health or life, such as emergencies from the cardiovascular system or type 2 diabetes, it is necessary to take appropriate measures to determine the scale of the problem and to promote pro-health behavior. Virtual-reality technologies (VR) are very new and developing programs, which use interactive experience of artificial reality in relation to patients who use them. To create this reality, computer programs are used. VR are interactive, real-time, three-dimensional and contain copies of real people, sceneries and events. Different VR systems allow users to immerse in them, which means creating a sense of reality in the virtual world. Studies on VR have been observed for about 15 years. They are based on rehabilitation of patients suffering from balance disorders and having problems with cognitive functions, for example concentration, memory or orientation. Physiotherapy of patients with VR allows to select specific and attractive tasks in the form of exercises, often computer games. In that, the acquired skills and functions in artificial conditions can be used later in everyday functioning. Virtual-reality programs are used in various disease entities. Most often, the studies of the effectiveness of physiotherapy with VR concern neurological rehabilitation – people after strokes, craniocerebral injuries, multiple sclerosis and disturbances of the balance control system caused by aging.

**Aim of the study:** The aim of the study was to determine the nutritional status of a representative group of the elderly, characterized by a high level of independence, from Bydgoszcz and its vicinity, and in this context to show to what extent the respondents struggle with the problem of overweight or obesity.

**Material and methods:** The study, which lasted from October to December 2019, at the Department of Geriatrics of the University Hospital No. 1 in Bydgoszcz, was attended by 34 people aged 61-83, living in the home environment, and who previously participated in the Department's research projects. Recruitment took place via telephone calls, and the respondents arrived at the research site on their own. As part of the nutritional status assessment, a history of chronic diseases and pharmacotherapy was collected, BMI was calculated, nutritional status was assessed using the MNA (Mini Nutritional Assessment) scale and body composition analysis was performed using the TANITA BC-545 device. The obtained results were statistically analyzed using the STATISTICA 13.3 software.

**Results:** The vast majority of the subjects (85.3%) were women, and the percentage of body fat, according to the body composition analysis, was in the range of 21.3-50.6% (mean 36.3%). BMI ranged from 20.17 to 40.27 (mean 28.1). Analyzing the obtained results, only 29.03% of the respondents had a normal body weight, the remaining respondents were overweight or obese. Abdominal obesity was diagnosed in 86.7%. 23.5% of participants reported weight loss in the last three months. According to the MNA scale analysis, 5 patients showed a risk of malnutrition, and on the basis of the collected history it was found that 32.4% of participants permanently take more than three drugs a day..



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**Conclusions:** The results obtained in the study allow for the conclusion that the states of overweight and obesity are significant problems for elderly people who live in the home environment and show high independence. A possible factor here is the lifestyle and the lack of serious diseases in the studied group that would lead to malnutrition. However, research on a larger group of seniors, especially men, is necessary to reliably determine the scale of the phenomenon. Virtual-reality technologies are still a growing field. Physiotherapy of people with balance disorders or problems with cognitive functions such as concentration, memory and orientation using VR aims to prevent the additional effects of the disease, such as falls or feeling of confusion. More scientific reports about virtual-reality technologies are needed to show the effect of rehabilitation on a bigger group of people with a specific illness. There is such a necessity to understand the diversity of VR applications.



**Title:** Medical emergencies in children under the age of three based on data from the Regional Ambulance Station in Bydgoszcz

**Authors:** Patrycja Żarnoch

**Session:** Health Sciences Session I

**Introduction:** Dealing with a life-threatening child requires the paramedic to know the anatomical and developmental differences characteristic for a given age category of a small patient. This knowledge is necessary to be able to effectively assess the patient's condition and provide professional help, because both the use and dosage of medications, as well as the type and size of emergency equipment used, are closely related to the age of the child.

In the future, the study may be extended to other cities or regional, and even to the whole of Poland. The research will help, medical emergency teams will be able to be better equipped during visits to pediatric patients.

**Aim of the study:** It is a retrospective research based on data from 2018-2019 from the Regional Ambulance Station in Bydgoszcz, made in 2020. The aim of the study was to analyze the occurrence medical emergencies in children under the age of three based on data from the Regional Ambulance Station in Bydgoszcz, with particular emphasis on medical rescue operations provided at the scene.

**Material and methods:** Retrospective study included data of patients under the age of three based from the medical rescue team departures from the Regional Ambulance Station in Bydgoszcz. The data includes: age, reason for the call, diagnosis according to the ICD 10 category, data on medical history and physical examination, selected medical procedures performed during the call, procedure of the paramedics. The study uses the method of retrospective data analysis. The obtained data were analyzed statistically. All calculations and figures were made with the use of Microsoft Excel, using standard functions of this program. In the descriptive analysis, the results are presented in tables in which the numbers are presented.

**Results:** In the years 2018-2019, based on the calls of the medical rescue teams of the Regional Ambulance Station in Bydgoszcz, 1988 cases of life-threatening conditions in children under the age of three were recorded. The most common life-threatening condition was fever of unspecified origin. It accounted for 24% of all calls of medical rescue teams to medical emergencies in children under the age of three category. The most common procedure performed by medical rescue team was monitoring of vital functions. Paracetamol was the most used drug by medical rescue team. No similar studies have been command in the Kuyavian-Pomeranian. The research will help paramedics to better prepare for help in the medical emergencies in children under the age of three.

**Title:** Impact of various factors on the frequency of side-effects, duration, and occurrence of post-vaccination pain.

**Authors:** Anna Ryszewska, Paweł Niewiadomski, Kornelia Kędziora-Kornatowska

**Session:** Health Sciences Session I

**Introduction:** Coronavirus disease 2019 (COVID-19) is a novel disease that was firstly reported in December 2019 in Wuhan, China. The disease spread all over the world, causing a pandemic. The pandemic affects our lives strongly and impacts on domestic economies. The main strategy for combating the disease is vaccination. Until now, 7,3 mln people in Poland have been vaccinated with at least one dose, of which 2,5 mln have been fully vaccinated. The invention of the vaccine and generation of herd immunity are significant points in the strategy of fighting the pandemic. Nevertheless, the vaccine has different side effects, which vary in different people.

**Aim of the study:** The aim of the research was to study the frequency of side effects, the relationship between age, sex, comorbidities, long-term medication, lifestyle, and getting a flu vaccination. We also wanted to find out if getting COVID-19 affects the severity of adverse reactions after the COVID-19 vaccination.

**Material and methods:** We conducted an authorial survey using Google Forms. The survey was conducted from 09.03.2021 to 14.04.2021. The survey was distributed via Facebook, the questions were anonymous. The questionnaire consisted of 106 questions concerning age, sex, a type of COVID-19 vaccination, getting COVID-19, lifestyle, long-term used drugs, comorbidities, receipt of influenza vaccination. An important part of the survey were questions about types of side effects and their duration. Statistical analysis was performed using Statistica version 13.1. The study, which lasted from October to December 2019, at the Department of Geriatrics of the University Hospital No. 1 in Bydgoszcz, was attended by 34 people aged 61-83, living in the home environment, and who previously participated in the Department's research projects. Recruitment took place via telephone calls, and the respondents arrived at the research site on their own. As part of the nutritional status assessment, a history of chronic diseases and pharmacotherapy was collected, BMI was calculated, nutritional status was assessed using the MNA (Mini Nutritional Assessment) scale and body composition analysis was performed using the TANITA BC-545 device. The obtained results were statistically analyzed using the STATISTICA 13.3 software.

**Results:** There were 674 respondents in our study. The majority of them were women. 12% of the respondents (80 of 674) did not report any side effects after vaccination. The frequency of side effects was higher in women (91%) compared to men (73%) and was statistically significant. Side effects were declared by 91% of convalescent and 87% of respondents who did not suffer from COVID-19 – the difference is not statistically significant which means that frequency of side effects does not differ between these groups.

**Conclusions:** We can identify factors that affect the severity of side effects after the COVID-19 vaccination. Various factors, including age, sex, getting COVID-19, lifestyle, long-term medication affect the frequency and duration of side effects. Through our survey, we can verify common hypotheses concerning factors included in our research.





**Title:** The appearance of pain in the spine sections in active seniors from Bydgoszcz and the surrounding area

**Authors:** Aleksandra Modlińska, Anna Ziółkowska, Aleksandra Piotrowska, Jakub Husejko, Oliwia Jarosz, Hanna Bednarek, Katarzyna Rocławska

**Session:** Health Sciences Session I

**Introduction:** Backache is a serious clinical and social problem. According to scientific data, these ailments affect up to 80% of the elderly. The aging processes of the organism have a significant impact on the locomotor system. Spinal pain changes most often concern degenerative changes in vertebrae, discs and articular surfaces. Civilization conditions, such as a sedentary lifestyle or the development of motorization, increase the number of patients with back pain. Microtrauma, deviations in body structure and occurring congenital defects of the spine, recurring during human life, predispose to degenerative and overload changes in the musculoskeletal system. Despite the constant improvement of prophylactic methods, rehabilitation treatment still plays an important role in reducing or eliminating back pain.

**Aim of the study:** The aim of the study was to determine the occurrence of back pain in a representative group of elderly people, characterized by a high degree of independence from Bydgoszcz and its vicinity, and to emphasize the importance of physical activity in everyday life.

**Material and methods:** 36 people aged 61 to 83 participated in the study, which lasted from October to December 2019 at the Department of Geriatrics of the University Hospital No. 1 in Bydgoszcz. The participants are people who are independent in their daily activities and who actively participated in the Department's earlier research projects. As part of the assessment of the occurrence of pain, two pain scales were performed – the VAS scale and the pain incidence questionnaire divided into sections of the spine and frequency. The obtained results were statistically analyzed using the STATISTICA 13.3 software.

**Results:** The vast majority of respondents were women, namely 83.33%. The occurrence of pain, regardless of the frequency and duration, during the physiotherapeutic examination was reported by as many as 21 people. This is 58.33% of the respondents. On the other hand, 61.11% of the study participants admitted that they experience chronic pain. Analyzing the results, back pain most often affects the lumbar region. Disturbing pain in this segment occurring for more than 3 months was found in 77.27% of respondents who reported that they experienced chronic pain.

**Conclusions:** The occurrence of back pain is a frequent phenomenon in the elderly. Chronic pain among the elderly affects more than every second person over 60 years of age and usually affects the lumbar region. More research is needed on a larger group of people to assess the scale of this phenomenon.



**Title:** The experience of quarantine among employees of the National Medical Rescue System

**Authors:** Dominika Grzonkowska, Anna Burak

**Session:** Health Sciences Session I

**Introduction:** The COVID-19 pandemic has changed the world. It has particularly affected the medical community. Due to direct contact with people infected with the SARS-CoV-2 virus, this professional group is particularly vulnerable to infection. This involves being quarantined. Coronavirus disease 2019 (COVID-19) is a novel disease that was firstly reported in December 2019 in Wuhan, China. The disease spread all over the world, causing a pandemic. The pandemic affects our lives strongly and impacts on domestic economies. The main strategy for combating the disease is vaccination. Until now, 7,3 mln people in Poland have been vaccinated with at least one dose, of which 2,5 mln have been fully vaccinated. The invention of the vaccine and generation of herd immunity are significant points in the strategy of fighting the pandemic. Nevertheless, the vaccine has different side effects, which vary in different people.

**Aim of the study:** The aim of this study was to analyze the experience of National Emergency Medical Service (NEMS) employees who were quarantined during the COVID-19 pandemic.

**Material and methods:** The survey was conducted on the Survio online platform between December 2020 and February 2021 using a proprietary survey questionnaire. Information about the opportunity to complete the survey was diffused on social networks in medical staff groups and through Chambers of Nursing. The study was approved by the Bioethics Committee (KB 523/2020). The survey was completed by 89 NEMS employees. The data was compiled using Microsoft Excel and Statistica 10. e conducted an authorial survey using Google Forms. The survey was conducted from 09.03.2021 to 14.04.2021. The survey was distributed via Facebook, the questions were anonymous. The questionnaire consisted of 106 questions concerning age, sex, a type of COVID-19 vaccination, getting COVID-19, lifestyle, long-term used drugs, comorbidities, receipt of influenza vaccination. An important part of the survey were questions about types of side effects and their duration. Statistical analysis was performed using Statistica version 13.1. The study, which lasted from October to December 2019, at the Department of Geriatrics of the University Hospital No. 1 in Bydgoszcz, was attended by 34 people aged 61-83, living in the home environment, and who previously participated in the Department's research projects. Recruitment took place via telephone calls, and the respondents arrived at the research site on their own. As part of the nutritional status assessment, a history of chronic diseases and pharmacotherapy was collected, BMI was calculated, nutritional status was assessed using the MNA (Mini Nutritional Assessment) scale and body composition analysis was performed using the TANITA BC-545 device. The obtained results were statistically analyzed using the STATISTICA 13.3 software.

**Results:** The results showed various aspects of being in quarantine. As many as 72.9% of the respondents quarantined at their place of residence with family members admitted that they feared for the health and life of their loved ones. Almost half of the isolated individuals felt lonely, useless, anxious, and frustrated. Most people admitted that they experienced depression at this time. The respondents were mostly bored, but the worst was the inability to leave the house and the lack of a social life. 46.1% admitted that they missed work. 60.7% of the respondents thought of quarantine as a break from work. It is worrying that 78.7% of the people indicated that they did not have the possibility to receive psychological help during this time. Only two people admitted that they had received such help. Half of the staff felt stressed. Sleep was the most frequently chosen way to cope with stress. 68.5% of the subjects slept more than usual and 7.9% of the subjects slept for days. Additionally, it was a relief for them to talk to someone close, and be able to listen to music, study, do housework, garden, do some physical activity, pray, as well as consume stimulants: alcohol (34.8%), cigarettes (21.3%), psychoactive substances (7.8%). Almost half of them lost their source of income. The quarantine contributed to additional activities such as: catching up on reading and films, cleaning and minor

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home repairs, physical activity at home, cooking, self-development and education or cultivating passions. After the quarantine, the subjects were less afraid of coming into contact with symptomatic patients than before, while 43.8% feared being quarantined again.

**Conclusions:** The emotions that accompany quarantine are very different and seem to be determined by individual predispositions of the people undergoing it. Being quarantined can be a positive or negative experience that can be influenced by where and how it is carried out. However, people who find quarantine a difficult experience must be supported.



**Title:** Nursing care of a geriatric patient with urinary incontinence - a case study

**Authors:** Dżesika Kulisz

**Session:** Health Sciences Session II

**Introduction:** Although urinary incontinence can affect any age group, its risk increases with age and it affects women twice as often. The problem is particularly exacerbated in people with reduced mobility. Because of the high prevalence of urinary incontinence among the elderly and the problem it represents, it has been classified as one of the Great Geriatric Problems, a set of problems occurring in the elderly that cause functional incapacity and thus reduce the quality of life of these patients.

**Case report:** a 79-year-old female patient with urgency urinary incontinence residing in a home environment. She lives alone and uses crutches to get around due to a hip surgery she had.

**Conclusions:** Life expectancy in Poland continues to increase, resulting in the emergence of the phenomenon of "double ageing"- more pensioners both under 80 years of age and over 80 years of age. Consequently, an increase in the proportion of Grand Geriatric Problems, which include urinary incontinence, is to be expected among the elderly. The aging process causes significant functional and functional changes in the body, which also occur in the urinary system. These disorders make it very difficult to function in everyday life, cause discomfort due to their intimate nature and result in lowering of mood or even lead to exclusion from social life. Urinary incontinence is a particularly important problem in people with limited mobility and those who move with the aid of crutches, as the restriction in walking prevents them from moving quickly to the toilet and thus from being able to make it on time. Therefore, it is important to diagnose the problem early and implement an appropriate nursing care plan because a nurse can impact a patient's life in fundamental ways. Proper counseling and appropriate selection of products that compensate for lost sphincter function can influence not only the nurse's appropriate response to the effects of the disorder, but also improve the patient's quality of life. The use of gold nanocages is of considerable importance in cancer treatment. This method allows for effective inhibition of tumor growth with minimal damage to non-tumorigenic tissues and organs. It is an auspicious alternative in clinical cancer treatment that exposes the patient to side effects of therapy to a less extent.



**Title:** Diaper material to a risk of diaper dermatitis in children

**Authors:** Paulina Wilczewska

**Session:** Health Sciences Session II

**Introduction:** Every newborn and a child is known to have soft and delicate skin. One of the most integral parts of a baby's life are diapers that are well known in keeping their hygiene, but as well as they fulfil their function of protecting the baby from excessive licking, they may not protect them or may even be the actual cause of medical issues such as rashes and pathogen infections because of the material they are made out of.

**Aim of the study:** The aim of this article is to draw attention to the influence of the material of children's diapers in terms of the risk of diaper dermatitis and skin infections. The purpose of the study is to pay attention to the composition of individual diapers and functionality in terms of maintaining the relative skin dryness in the place where the diaper is worn.

**Materials and methods:** Materials were collected from the latest researches and case studies published of Google Scholar. The method included eighty volunteers in the study with no signs of health issues who were given two inch damp diaper patch to wear on their forearm for two hours. To measure any access skin wetness under the diaper patches there was an evaporimeter used in the study. Measures also included calculations of the amount of moisture retained in the patches.

**Results:** The case study found less moisture where the super absorbent disposable diapers was places as well as more urine was collected rather than cloth reusable and conventional disposable diapers which makes super absorbent disposable diapers showing the best results on preventing diaper dermatitis and skin infections. The super absorbent disposable diapers shown the best results on keeping skin dry from access moisture, conventional diapers' performance on preventing moisture were less effective comparing to super absorbent diapers. The lowest score on moisture-capturing ability were the cloth diapers despite of different amounts of layering included.

**Conclusions:** The best diaper to maintain baby's hygiene and health is the super absorbent disposable diaper. The cloth diaper doesn't fulfil its function so it is not proffered to use it on daily.



**Title:** Adverse conditions caused by the pandemic as potential factors for hip dislocation after arthroplasty? – Case study

**Authors:** Anna Ziółkowska, Aleksandra Modlińska, Eliza Oleksy, Paulina Kasperska, Adriana Wielgus, Katarzyna Wojtysiak, Jakub Dreliszak

**Session:** Health Sciences Session II

**Introduction:** Hip arthroplasty is a surgical procedure consisting in replacing the diseased cartilage and bone tissue of the hip joint with an artificial prosthesis. The most common cause is osteoarthritis of the hip, which causes degeneration of the joint, followed by chronic pain syndrome, limited mobility, and problems with movement.

**Case study:** A male patient, 83 years old, was referred for hip arthroplasty surgery due to advanced degenerative changes in the left hip. Comorbidities: chronic heart failure, chronic coronary syndrome, ischemic heart disease (unstable angina pectoris - treated with angioplasty in 2015), moderate tricuspid valve regurgitation, type 2 diabetes, arterial hypertension.

The surgical procedure was performed in December 2020 at Antoni Jurasz University Hospital No. 1 in Bydgoszcz. After a successful surgery, the patient was referred home. After 2 weeks, the left hip endoprosthesis was dislocated. On admission, the SARS-CoV-2 PCR test was positive. Due to the infection, the patient was referred to the dr. W. Biegański Regional Specialist Hospital. in Grudziądz. There, a closed reposition of the hip joint was applied under general anesthesia. After the SARS-COV-2 infection had been cured, the patient, as a convalescent, was transferred for further treatment to the Cardiology Department of the 10 th Military Research Hospital and Polyclinic in Bydgoszcz due to his general good condition. During his stay at the Clinic, the left hip endoprosthesis was dislocated again due to a fall on the left hip area. In the operating theater, the hip joint was repositioned under general anesthesia and derotation shoes were put on both lower limbs. After cardiological stabilization, the patient in good general condition was discharged home with instructions for further treatment and health checks.

**Conclusions:** Post-operative rehabilitation is recommended after hip arthroplasty. Despite hospital rehabilitation and physiotherapeutic instructions, the patient developed a double hip joint dislocation. The patient was also a victim of the SARS-CoV-2 pandemic. For this reason, his treatment was carried out in as many as 3 hospitals. After the end of treatment, the patient is still not independent, requires care and long-term rehabilitation in order to regain health and independence.





**Title:** The dependence of short-term verbal memory on the endocrine function of adipokines in patients after 60 with diagnosed arterial hypertension

**Authors:** Hanna Bednarek, Aleksandra Modlińska, Jakub Husejko, Oliwia Jarosz

**Session:** Health Sciences Session I

**Introduction:** In the latest reports of the center it was reported that the concentration of such adipokines as vaspin, visfatin and adiponectin is important in supporting health in each age group of data analysis.

**Aim of the study:** The aim of the work is to assess the short-term verbal memory of the endocrine function of adipokines in patients over 60 years of age with diagnosed arterial hypertension. Out of 407 people participating in the study, 14 patients with diagnosed arterial hypertension after the age of 60 and a control group consisting of 12 subjects after 60 years of age. no known hypertension.

**Material and methods:** Product parameters were examined: body mass, BMI, percentage of the instant, lean body mass, mass, percentage of water in the body, diastolic and systolic arterial blood pressure, circumference of: arm, hips, biceps and triceps, basal metabolism, current health status, sum of field activity, concentration of vaspin, adiponectin and visfatin. Mountain participants subjected to such tests as: GDFS scale, MoCA test, MMSE test.

**Conclusions:** The results of the study showed that the concentration of adipokines in the blood correlates with the functioning of short-term verbal memory in elderly people over 60 years of age with diagnosed arterial hypertension.



**Title:** Phase angle in children with IBD - a valuable parameter or an unnecessary addition?

**Authors:** Filip Biernacki

**Session:** Health Sciences Session I

**Introduction:** Inflammatory Bowel Disease (IBD) is a chronic condition characterized by inflammation and ulceration of the gastrointestinal wall, with periods of remission and exacerbation. Their pathogenesis is multifactorial and the symptomatology is varied. These include: Crohn's disease and ulcerative colitis. Malnutrition is common complication of both diseases. The phase angle is a cell health indicator. It indicates a direct relationship with the health condition of patients. Malnourished children are found to have a decreased phase angle.

**Aim of the study:** The aim of the study was, the assessment of the phase angle in children with inflammatory bowel diseases.

**Material and methods:** The study included a group of children aged 7-18 from the Kuyavian-Pomeranian Voivodeship. The Segmental body composition analysis was performed using the electric bioimpedance method with the Tanit MC-180MA method.

**Results:** In over 70% of the examined children, the value of the phase angle was below normal. Statistical analysis showed that the value of the phase angle correlates with the BMI index. The positive correlation between BMI and phase angle confirms that people with IBD properly nourished are characterized by high cell quality. Phase angle is a valuable parameter in assessing the nutritional status of children with IBD. The value of the phase angle in children with IBD below the norm can be seen as a marker of the severity of the inflammatory process in the intestines.



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## Poster Block

### **Jury:**

dr hab. Barbara Ruszkowska-Ciastek, prof. UMK

dr hab. Krzysztof Skowron, prof. UMK

dr hab. Tomasz Dziaman, prof. UMK

### **Moderator:**

Hanna Bednarek

Maja Kozdrój



**Title:** Application in silico methods in drug toxicity studies

**Authors:** Magdalena Kowalska, Łukasz Fijałkowski, Alicja Nowaczyk

**Session:** Poster Session

### Introduction:

Pharmaceutical safety is a rapidly developing area of pharmacy that aims to assess the potential risks associated with improperly conducted pharmacotherapy. Safety assessment is a crucial part of bringing a new drug to market, as well as for drugs already in use that are being tested for new indications.

### Material and methods:

According to the literature, one of the most commonly used drugs off-label in everyday clinical practice is Paroxetine, belonging to the SSRI group (Selective Serotonin Retake Inhibitors). The lack of registration of this drug for a number of conditions is due to the fact that there is not sufficient information especially in papers devoted to explanation of the paroxetine mechanism of action on specific targets. For this reason, the main issue of this work is the presentation of data related to the description of paroxetine activities tested at the molecular level based on the collected crystallographic data. The way paroxetine binds to the active site of selected receptors, which affects the way the drug interacts, is graphically presented. Using available software (ProTox II and AdmetSAR), paroxetine was assessed by comparing its safety with other drugs from the same class of drugs.

### Results:

The tests conducted were confirmed by literature data, proving the effectiveness of in silico methods in the first step of drug safety testing.

**Title:** Effects of smoking cessation on daily blood pressure profile in cardiac rehabilitation patients after acute coronary syndromes

**Authors:** Vira Lutska, Natalia Kuz

**Session:** Poster Session

### Introduction:

It is known that smoking is one of the most aggressive risk factors for the development of acute coronary syndrome (ACS), because it has a significant negative impact on both coronary and peripheral circulation. However, the effect of smoking on blood pressure (BP) regulation in cardiorehabilitation patients who undergo physical training programs and continue to smoke after an acute coronary event remains poorly understood.

### Aim of the study:

To study the influence of smoking factor on the indicators of blood pressure (BP) regulation in patients after ACS undergoing cardiorehabilitation (CR) treatment.

### Material and methods:

We examined 64 patients, who after ACS (not more than 1 month ago) underwent a CR program in the rehabilitation department after heart disease. The CR program included dosed therapeutic walking, therapeutic gymnastics, optimal drug therapy. In order to quit smoking, all patients who smoked were given individual counseling using the 5As strategy, and unmotivated smokers were given the 5R strategy. Depending on the smoking habit, all patients were divided into two groups. The first (I) group included patients (n = 36) who gave up smoking during the CR, the second (II) group - smokers (n = 28) who continued to smoke. The main indicators of daily blood pressure monitoring in the first and 24 days of CR treatment were determined in patients of the study groups.

### Results:

The analysis of indicators after passing the CR program showed a more pronounced positive trend in patients of group I, compared with patients of group II: reduction of average daily (AD) systolic (S) BP - by 11.9% (from 147.4±7.7 to 129.9±6.7 (I) mm Hg, p<0.001) and 5.6% (from 147.5±10.5 to 139.3±9.0 (II) mm Hg, p<0.001), AD diastolic (D) BP - by 14.9% (from 90.2 ±6.4 to 76.8±5.8 (I) mm Hg, p<0.001) and 10.4% (from 93.9±6.8 to 84.1±6.8 (II) mm Hg, p<0.001), AD heart rate (HR) - by 10.1% (from 82.7±8.1 to 74.4±6.2 (I) beats/min., p<0.001) and 8.2% (from 84.6±8.2 to 77.7±8.3 (II) beats/min., p<0.001), AD variability (V) of CBP - by 11.6% (from 17.2±2.6 to 15.2±2.6 (I) mm Hg, p<0.001) and 6.9% (from 17.4±2.7 to 16.2±2.1 (II) mm Hg, p>0.05), AD variability (V) of DBP - by 19.5% (from 15.4±2.8 to 12.4±2.9 (I) mm Hg, p<0.001) and 5.7% (from 15.7±2.0 to 14.8±2.0 (II) mm Hg, p>0.05), the magnitude of the morning increase (MMI) in SBP - by 22.6% (from 60.7±12.5 to 47.0±11.3 (I) mm Hg, p<0.001) and 11.5% (from 62.7±11.0 to 55.5±9.3 (II) mm Hg, p<0.05), the magnitude of the morning increase (MMI) in DBP - by 22.6% (from 55.4±9.9 to 42.9±9.4 (I) mm Hg, p<0.001) and 6.1% (from 57.6±6.8 to 54.1±7.3 (II) mm Hg, p>0.05).

### Conclusions:

Smoking cessation significantly improves the results of CR in patients who have undergone ACS. In patients who continued to smoke during CR, the achievement of the recommended target values and positive significant changes in the indicators of BP variability and the magnitude of the morning increase in BP were not registered.



**Title:** The essence of physical education in the work of a paramedic and his / her mental health

**Authors:** Nicholas Karolak, Katarzyna Ročławska

**Session:** Poster Session

### Introduction:

The aim of the work is to show the essence of physical education at the early stages of professional careers of paramedics (while still being educated and in college) and the impact of a healthy lifestyle on coping with stress in this professional group and reducing the possible occurrence of PTSD (Post-Traumatic Stress Disorder).

### Material and methods:

I used the method of analyzing previous research in the field of public health and physical education carried out in the professional group of paramedics. As well as statistical research showing the incidence of post-traumatic stress disorder among rescuers. On the basis of the analyzed materials, I drew general conclusions and made a thesis that physical education has a very positive meaning in the work of a paramedic, both in the context of physical and mental health. I checked the thesis during my three-year professional work as a qualified first aid rescuer on the medical transport team for the Gizińscy Medical Center and during assistant internships at the Medical Rescue Team and Hospital Emergency Department in Bydgoszcz.

### Results:

Early and regular introduction of physical education to the life of rescuers significantly reduces the number of injuries suffered during work, which is characterized by the requirement to carry heavy equipment and patients. By reducing the number of accidents and injuries at work, the level of stress is reduced. On the other hand, physical education can also be a form of de-stress and will not allow stress to be transferred to the home environment. However, it is not a complete substitute for constant psychological support after particularly stressful events, but it definitely improves the quality of therapy.

### Conclusions:

Finally, I ask an open question, which is to give viewers and listeners the opportunity to draw their own conclusions and reflect on their current work, and whether healthy physical exercise allows you to improve your professional work and its effects.





**Title:** Application of gold nanoparticles in oncotherapy

**Authors:** Marta Dąbrowska, Zuzanna Wojtkowiak, Kornelia Cichoń, Magdalena Izdebska

**Session:** Poster Session

### Introduction:

Gold Nanocages have gained great popularity due to favorable chemical and physical properties that may increase the effectiveness of cancer treatment. In particular, their optical properties are a desirable feature that allows them to be used as carriers for the delivery and controlled release of drugs; and as transducers for photothermal destruction of tumor cells. [doi: 10.1021/ar200061q] In addition, nanostructures are also able to enhance the radiosensitivity of tumor cells in radiotherapy which is one of the most significant methods of treatment of cancer [doi: 10.2147/IJN.S287523].

### Aim of the study:

The aim of this study is to present the use of gold nanocages in the treatment of cancer based on a review of the literature from the last 10 years, available in the Pubmed and Google Scholar databases.

According to the scientific reports, Au nanostructures with strong optical absorption in the near-infrared area convert light into heat in vivo to destroy cancer cells through hyperthermia. This enables using photothermal therapy instead of traditional treatment methods such as radiotherapy and chemotherapy, which cause increased side effects [doi:10.1021/nn800370j]. A number of scientific studies also apply to the use of the porous walls of gold nanostructures to facilitate medicine delivery to the cancer cell [doi:10.1021/ar200061q]. Gold nanoparticles have been applied in trace biomarker labeling by spectroscopic methods as well as in contrasting lesions during CT imaging [doi:10.3390/ijms20030588].

### Results:

The use of gold nanocages is of considerable importance in cancer treatment. This method allows for effective inhibition of tumor growth with minimal damage to non-tumorigenic tissues and organs. It is an auspicious alternative in clinical cancer treatment that exposes the patient to side effects of therapy to a less extent.



**Title:** The impact of the personality traits and behaviors underlying the biological impulse control on the development of overweight and obesity

**Authors:** Sylwia Kozak, Konrad Kaminiów, Maksymilian Macherski, Katarzyna Wyskida, Mateusz Glinianowicz, Monika Bąk-Sosnowska, Magdalena Olszanecka Glinianowicz **Session:** Poster Session

### Introduction:

The pathophysiology of obesity is based on the interaction between environmental, genetic, psychosocial, and behavioral factors. It is increasingly pointed out that some personality traits predispose to overweight and obesity. Of great importance for the prevention is to accurately define the group of people who, due to their temperamental conditions and the biological basis of impulse control, are at risk group of overweight and obesity development.

### Material and methods:

Three hundred and three subjects (including 175 women) were included in this study. The temperamental conditions were assessed on the basis of EAS scale (assessing fear and anger, activity, and sociability) and control of impulses using IVE scales (considering impulsiveness, the propensity to risk, and empathy).

### Results:

Group included 18 underweight (5.9%), 138 normal weight (45.5%), 100 overweight (33%) and 47 (15.5%) obese subjects. In overweight and obese groups, we observed a positive correlation between the degree of impulsiveness and the level of anger. Also, in the overweight group, a positive correlation between the empathy level and the level of fear was confirmed.

### Conclusions:

A higher degree of anger may increase impulsiveness that may contribute to overweight and obesity development. Among overweight persons being more empathic can significantly affect the level of fear that predispose a sedentary lifestyle..