INTERNATIONAL MEDICAL STUDENTS' CONFERENCE

SEPTEMBER 21-23th 2020 CRACOW

BOOK OF ABSTRACTS

Honorary Patronage:

Rector of the Jagiellonian University for the Medical College
Prof. dr hab. med. Tomasz Grodzicki

https://imsc.cm-uj.krakow.pl

INVITATION

Dear Students,

For the first time International Medical Students' Conference, organized annually in Krakow, has to be moved on line. Virtual conference is nothing unusual because such conferences have existed since the late 1990s. This year COVID-19 pandemic forced us to change the meeting formula. We are aware that regardless technology improvement virtual conferences lack of face-to face in-person human interaction. But if we want to continue a tradition of bringing together young researches from all over Poland studying medicine and medical sciences we all must accept the current medical recommendation regarding social distancing. Current situation brings upon a famous quote from Sir Alexander Graham Bell: "When one door closes, another opens...". We wish you that the new digital door will provide excellent opportunities for wide participation, interaction and learning.

The major goal of these medical students' conferences is to share an insight into the recent basic and clinical research and cutting edge medical technologies, which gains immense interest with presence of medical adepts, brilliant young researchers, and talented student communities. Due to international character of these meetings in the past, students not only representing Medical Faculties of major universities in Poland but also young students from other countries are welcomed to present and exchange break-through ideas relating to medicine and biomedical sciences. Medicine is one of the most ancient professions known from the beginning of civilization. It promotes top level research since this discipline is constantly moving forward after visionary statement of Dr William J. Mayo, the outstanding physician and founder of famous Mayo Clinic in United States. Therefore, we expect that your presentations during the conference will be competitive and focusing attention on the recent outstanding achievements in the field of medicine thus prompting participant's discussion. Thus, the scientific sessions at the meeting are devoted to explore the diverse and evolving modalities in diagnostics, methodologies and technology in experimental and clinical medicine. Based on our own experience, we're confident that being open to new advances in basic and clinical medicine would benefit everyone in their professional development throughout the rest of your medical education and in any future career.

We are very proud that so many of you, open-minded young people, will participate in the virtual conference and will have an opportunity to present and to discuss your current work. As you know, each question in the discussion triggers many new questions. Your research studies accelerate the progress in medical knowledge and contribute to new discoveries. We do hope that the virtual conference, in similar way as traditional conferences held in recent years, will inspire you with new ideas for research subjects and will be the beginning of your adventure with science. We wish you consequence in your research studies and joy of discoveries.

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WORKSHOPS

How does your memory work? – Facts and Myths

Students' Scientific Group – Brain Team

Coordinator: Aneta Myszka

E-mail: anetamyszka95@gmail.com

Memory is the ongoing process of information retention over time. Because it makes up the very framework through which we make sense of and take action within the present, its importance goes without saying. But how exactly does it work?

Incorrect beliefs about the properties of memory have broad implications: The media conflate normal forgetting and inadvertent memory distortion with intentional deceit, juries issue verdicts based on flawed intuitions about the accuracy and confidence of testimony, and students misunderstand the role of memory in learning.

What is Memory? How do we retain and then access all of that information whenever we need it? what's the best way to improve your powers of recollection? What, if anything, should we do to keep our memory active, sharp, and always ready to take on more. What is Memory? How do we retain and then access all of that information whenever we need it? what's the best way to improve your powers of recollection? What, if anything, should we do to keep our memory active, sharp, and always ready to take on more.

Using the latest scientific reports we will try to answer these and many other questions. If you would like to check the possibilities of your memory, get to know your weakness and strengths, our workshops are created especially for you!

Cardiac Surgery Workshop

Students' Scientific Group at Department of Cardiac Surgery and Transplantation, Jagiellonian University Medical College, John Paul II Hospital, Cracow

Coordinator: Veranika Baravik

E-mail: veronika.br97@gmail.com

Tutor: Prof. Roman Pfitzner

Opportunity to learn surgical sewing, especially cardiac surgery on the hearts of pigs. After the workshops, you can acquire skills such as tying surgical nodes, sewing in various ways, sewing the dentures to the heart.

Eyes of a Neurosurgeon – Neurosurgical Experience

Students' Scientific Group at the Department of Neurosurgery and Neurotraumatology JU MC

Coordinator: Maciej Frączek

Tutor: Roger Krzyżewski MD

E-mail: maciej.fraczek@student.uj.edu.pl

Have you ever thought what it looks like to operate on the human brain? This workshop will allow you to see the neurosurgeon point of view when performing three neurosurgical procedures with commentary. You will be able to see how it looks to perform aneurysm clipping, brain neoplasm surgery, and spinal disc procedure. After that, you will be able to ask questions and talk about neurosurgery and neurotraumatology.

Browsing and searching

Students' Research Group of Systematic Reviews

Coordinator: Katarzyna Jasińska

E-mail: katarzyna.jasinska100@gmail.com

Tutor: Dawid Storman MD

Browsing and searching are the two main attitudes of finding for information. They help to write a background for your manuscript, answer a clinical question or perform a review. But how to do it correctly? Is there any way to do it quickly and efficiently? During these workshops you will learn where to start searching, how to build a search strategy and how to assess the usefullness of information. You will learn databases from which you can get references and tools to manage them.

Workshops in pediatrics otorhinolaryngology

Student Scientific Society of Pediatric Otorhinolaryngology

Coordinator: Magdalena Dutsch-Wicherek

E-mail: dutsch.wicherek@gmail.com

Tutor: Associate Professor Magdalena Dutsch-Wicherek MD, PhD

We would like to hereby invite you to the pediatric otorhinolaryngology workshops, where you will have a chance to learn the ear, nose and throat examination under the supervision of Associate Professor Magdalena Dutsch-Wicherek, a specialist in otorhinolaryngology and children's' otorhinolaryngology.

In a small group of 10 students you will have a possibility to practice the technique of examination, learn how to grade tonsils overgrowth, and how it is relevant in a qualification process to an adenectomy procedure. Professor will also present the technique of endoscopic examination and its importance in laryngological examination.

The first underground sanatorium in the world – CANCELLED DUE TO COVID-19 OUTBREAK

SSG of Otolaryngology JUMC

Coordinator: Aleksandra Woźniak, Anna Pełkowska PhD

E-mail: aw.aleksandrawozniak@gmail.com, anna.pelkowska@kopalnia.pl

Tutor: Joanna Szaleniec PhD, Anna Pełkowska PhD

The first underground sanatorium in the world was created in the "Wieliczka" Salt Mine over 50 years ago on the initiative of Prof. Mieczysław Skulimowski. The treatment of patients included night inhalations in salt chambers, kinesitherapy and physical therapy on the surface. With time, the therapeutic activity was transferred to a complex of salt chambers located on the third level of the mine, 135 m underground. Kinesitherapy was introduced, including exercises tailored to a given disease and performed in a unique microclimate.

At present, respiratory rehabilitation of upper and lower respiratory tract diseases is carried out in a complex comprising 4 salt chambers of the "Wieliczka" Salt Mine: Jezioro Wessel, Stajnia Gór Wschodnich, Smok and Boczkowski. The specific microclimate is characterized by the presence of salt aerosol, with a high content of minerals (sodium, potassium, calcium and chlorine) (2.7-8.1 mg/m^3) and air purity which isolates patients from respiratory system irritants (pollutants, allergens). The microclimate also has a strong stimulating effect resulting from the need of the body to adapt to the climatic conditions in the salt chambers, i.e. temperature, humidity, air flow, air composition, ionization and atmospheric pressure. The concentration of allergens, such as pollen of plants, fungal spores or mite allergens, in the underground environment is very low, therefore these conditions are particularly beneficial for people suffering from allergies.

Our approach to the patient is reflected in the Lalonde's Health Field concept according to which the influence of health care and genetics on our health is less than ¼. Lifestyle and physical environment are the most important – these two factors can be modified by offering a unique microclimate, intensive patient education, as well as rehabilitation.

Rehabilitation of the respiratory system is aimed at:

- Improving the way of breathing
- Increasing strength and endurance of the additional respiratory muscles
- Reducing the excessive tension of the chest muscles
- Teaching the patient to breathe with an extended exhalation
- Facilitating expectoration of secretion
- Stimulating an effective cough
- Increasing physical activity
- Preventing exacerbations and hospitalizations
- Improving the quality of life

The goal of this workshop:

- To demonstrate breathing exercises to the participants
- Learn them to encourage the patients with airway diseases to train such exercises
- Show the participants the organization of the underground pulmonary rehabilitation ward

Additional notes:

- Due to the fact that the group has to go underground with an authorized person, people who will be late will not be able to join the group later.
- We highly recommend taking warm clothes due to low temperatures underground (approximately 14 degrees).

Hematology – Xpert BCR-ABL Ultra

Students' Scientific Group at the Department of Hematology

Coordinator: Magdalena Kamińska

E-mail: magdalena.m.kaminska96@gmail.com

Tutor: Elżbieta Szczepanek PhD, Magdalena Zawada MD, Prof. UJ Tomasz Sacha MD, PhD, Agnieszka Giza MD

Patients with chronic myeloid leukemia harbor the chromosomal translocation t(9;22), which corresponds to fusion of the BCR and ABL genes at the DNA level. The translated fusion product is an oncogenic protein with increased ABL tyrosine kinase activity causing cell transformation.

Xpert BCR-ABL Ultra is a quantitative test for BCR-ABL major breakpoint (p210) transcripts that provide highly sensitive and on-demand molecular results. Based on the innovative technology, it automates the entire test process including RNA isolation, reverse transcription and fully nested real-time PCR of BCR-ABL target gene and ABL reference gene in one fully automated cartridge.

The aim of the workshop is to familiarize participants with the basic knowledge concerning diagnostic molecular techniques in hematology. We provide a unique chance to observe and perform the Xpert BCR-ABL Ultra test.

We hope to see you there!

Serology workshop: the pretransfusion preparation- blood typing and antibodies screening

STDL Studenckie Towarzystwo Diagnostów Laboratoryjnych

Coordinator: Alicja Szadziewska, Anna Zimna, Ryszard Drożdż PhD

E-mail: alicja.szadziewska@gmail.com

Tutor: Associate Professor Magdalena Dutsch-Wicherek MD, PhD

Workshop dedicated to the process of pre-transfusion testing of the blood. What are the common methods used to check individual's blood type? What's the clinical significance of non-ABO blood group systems? How do we perform screening and identification of antibodies in the serum?

Seminar involves checking blood type of participants, performing laboratory tests based on agglutination to evaluate the transfusion requirements. Class includes short introduction and discussion about interesting medical cases in the field of serology and transfusion medicine.

Study Smarter, Not Harder

AMBOSS

In this workshop, doctors from the AMBOSS team will discuss with attendees the problems that we all face during our medical studies and show us ways to neutralize the obstacles that hold us back from getting our highest scores and becoming the best clinicians that we could be. It will also include a walkthrough of the AMBOSS platform, so that we can utilize our free access to its full potential! All IMSC attendees will get 14-days free access to AMBOSS!

This workshop is a great opportunity for all of us to try out this powerful study tool and get to know the doctors behind it. AMBOSS was created by a team of dedicated physicians and is being used by thousands of students to help boost their scores on international competitive exams like the USMLE and the IFOM, and also as a clinical reference while on the wards. Covering all the pre-clinical and clinical topics that students need, from the very first day of medical school to the last, this all-in-one platform is filled with learning features that ensure students are thoroughly prepared.

Location: online.

Vascular Ultrasoud workshops online

Coordinator: Aleksandra Włodarczyk

E-mail: wlodarczyk.aleksandra1212@gmail.com

Tutor: Mikołaj Maga MD

Looking for a hands-on vascular ultrasound course? Vascular Ultrasound workshops will provide medical professionals with proper duplex testing techniques for early detection of many vascular conditions, including:

- Peripheral arterial disease (PAD)
- Deep vein thrombosis (DVT)
- Abdominal aortic aneurysm (AAA)
- Carotid artery disease

Unlike many other ultrasound modalities, quality is more dependent on the skills of the technologist performing the exam. For this reason, hands-on vascular training led by vascular ultrasound experts is critical to advancing skills and performance of accurate diagnostic testing of vascular conditions.

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Michał Nowakowski MD, PhD
Mateusz Wierdak MD, PhD
Prof. Aleksander Konturek MD, PhD
Antoni Szczepanik MD, PhD
Prof. Jakub Kenig MD, PhD
Marek Sierżęga MD, PhD

Coordinators:
Adam Stępień, Gabriela Kanclerz

Scientific Patronage:

List of papers:

Clinical and radiological long term evaluation of unstable thoracolumbar and lumbar type A fractures treated by percutaneous surgery after implant removal
Gonzalo Mariscal, Rafael Lorente, Alexander Vaccaro, Pablo Palacios, Carlos Barrios, Alejandro Lorente

Mersey Burns Centre admission proforma quality improvement project
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Izabela Karpińska

Early mortality after pancreatectomy
Adrian Perdyan[1]

Reconstruction of scalp avulsion in a resource restraint rural hospital
Anna Mary Jose

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Clinical and radiological long term evaluation of unstable thoracolumbar and lumbar type A fractures treated by percutaneous surgery after implant removal

Gonzalo Mariscal, Rafael Lorente, Alexander Vaccaro, Pablo Palacios, Carlos Barrios, Alejandro Lorente

Tutors: Alejandro Lorente, Carlos Barrios

[1]Institute for Research on Musculoskeletal Disorders, School of Medicine, Valencia Catholic University, Spain
[2]Department of Traumatology and Orthopaedic Surgery, University Hospital Ramón y Cajal, Spain
[3]Department of Spine Surgery of Sidney Kimmel Medical Center at Thomas Jefferson University, USA

Introduction: Implant removal represents almost one third of all elective surgeries in orthopedics. There is no consensus regarding the time and need to remove the implants after vertebral fractures consolidation.
Aim of the study: To assess the clinical and radiological effects of implant removal in patients with vertebral type A fracture who underwent a percutaneous intervention.
Material and methods: We evaluated 31 patients (mean age of 38.2 ± 7.5 years) with thoracolumbar vertebral fracture (T11-L5) who underwent implant removal surgery after 24 months of fracture first surgery by a percutaneous approach. Inclusion criteria focused on patients' preferences. The radiological parameters included fracture angle, initial sagittal index, compression percentage, degree displacement, deformation angle. The clinical variables included Visual Analog Scale and Oswestry Disability index.
Results: There was no significant correction loss after removal surgery (before surgery and after 24 months): Fracture angle (16.8 ± 0.5 vs. 17.1 ± 0.5; $p > 0.05$), initial sagittal index (12.5 ± 0.5 vs. 12.7 ± 0.5; $p > 0.05$), kyphotic deformity (17.5 ± 0.6 vs. 17.8 ± 0.7; $p > 0.05$), compression percentage (35.6 ± 0.8 vs. 36.0 ± 0.7; $p > 0.05$), degree displacement (4.4 ± 0.4 vs. 4.5 ± 0.3; $p > 0.05$) and deformation angle (23.0 ± 0.7 vs. 23.1 ± 0.7; $p > 0.05$). Patients who presented symptoms before the surgery showed better Visual Analog Scale (1.2 ± 0.6 pre vs. 0.6 ± 0.3 post, $p < 0.05$) and Oswestry Disability Index (20.1 ± 6.8 pre vs. 15.7 ± 0.5, $p < 0.05$). No complications were reported.
Conclusions: Routine implant removal in patients undergoing a percutaneous approach to vertebral type A fracture is a safe technique and is associated with good clinical results without loss of radiological correction.
Key words: implant removal, vertebral fracture, percutaneous fixation, clinical, radiological, thoracolumbar unestable fractures.

Mersey Burns Centre admission proforma quality improvement project

Krystyna Drewniak, Vishal Parekh, A. Noshirwani, Shivani Patel, Anirban Mandal, Kayvan Shokrollahi

Tutors: Anirban Mandal, Prof. Kayvan Shokrollahi

St Helens and Knowsley Teaching Hospitals – Regional Mersey Burns Centre

Introduction: Burns injury management requires the involvement of a multidisciplinary team and is associated with a great cost to the NHS every year. A thoroughly completed Burns Admission Proforma can provide vital information for the effective management of a burn. It provides clear details of the injury, background medical information, details of the initial management plan, and enables sharing of information and tasks with other members of the multidisciplinary team.
Aim of the study: The aim of the study was to assess the quality of record keeping after the introduction of version 3.4 of the burns admission proforma. Another aim of the project was to identify areas for improvement and create an improved proforma (version 4.0).
Material and methods: Data on 63 individual fields on the Mersey Burns Proforma was collected for 80 new patients assessed on the Mersey Burns Unit between June and July 2019. The data was then compared to the previous audit in September 2018.
Results: In comparison to the previous audit, the quality of the completion of the Burns Admission Proforma continued to require further improvements. In comparison to the April-September 2018 audit, 14 fields improved and 36 deteriorated. Of note, TBSA % and print name improved, whilst time of clerking deteriorated.
Conclusions: The Burns Admission Proforma has made good progress from its original version and does require further adjustments to ensure complete data input. It sets a high standard for data collection and presents itself as a useful tool for other Burns units across the United Kingdom.
Key words: Burns, Proforma, NHS, Mersey Burns Centre, Proforma.

The influence of cryoglobulinemia level on postoperative treatment for acute intestinal obtruction tumor genesis patients

Kalinichenko Daryna Alexandrovna

Tutor: Candidate of Medical Sciences Brek O.O.

Department of General Surgery No 1, Kharkiv National Medical University, Ukraine

Introduction: Acute intestinal obstruction (IO) – one of the most severe diseases, is accompanied by high mortality, and is also one of the complications of bowel cancer. In such a situation, the surgeons have a dilemma: to perform a primary – radical surgery or to be limited to the simple imposition of fatigue. The insolvency of intestinal sutures occurs in 2% of cases, the risk factor can be a syndrome of cryoglobulinemia (CGE), which occurs due to the processing of cancer.
Aim of the study: Analysis of effectiveness of treatment of patients with IO of tumoral genesis depending on the level of cryoglobulins (CG).
Material and methods: Determining the level of CG and creating statistical research methods. The research was based on the observation of 96 patients, sick with IO of tumor genesis, who were operated in the 17th Kharkiv City Clinical Hospital in the period from 2017 to 2020.
Results: The average age of the patients was 54.7 ± 5.9 years. Patients were divided into 2 groups by the IO severity condition criteria: 1st group – patients with compensated and sub-

compensated forms of IO – 50 people (51.8%), 2nd group – 46 (46.2%) patients with uncompensated IO. In the 1st group – 22 cases of postoperative complications (44.00 ± 6.20%); in the 2nd group – 17 cases of postoperative complications (24.52 ± 6.50%). 9 people had postoperative complications in the form of wound suppuration: 1st group – 5 people, 2nd group – 4 people. In the structure of postoperative complications, intestinal anastomoses were predominated – 31.5% of patients got it, peritonitis – 9.3% of patients (among them 4 patients had got the formation of intestinal fistula) and the remaining 5.3% had symptoms of multiple organ failure. CGE was detected in the majority of patients tests – 62.5%; they formed the main group; other patients test did not contain CGE and they were included in the control group. Low CGE content is 79.4 ± 1.01 mg/l – 29%. The average CG content is 298.6 ± 2.5 mg/l – 56% – III type of CGE; high CG content 477.3 ± 48 mg/l – 15% – type II CGE.

Conclusions: It was discovered that a control of CGE level is a prerequisite for the prevention of postoperative complications, rapid recovery of bowel function and subsequent effective rehabilitation of the operated patients.

Key words: intestinal obstruction, cryoglobulinemia, cryoglobulins.

Thyroidectomy – is it safe to be performed by general surgery residents?

Natalia Przytuła, Piotr Tylec, Julia Wierzbicka

Tutor: Pisarska Magdalena MD

Jagiellonian University Medical College, Cracow, Poland
Students' Scientific Group at 2nd Department of Surgery

Introduction: Thyroidectomy is a surgery with high risk of serious complications. A well conducted operation prevents dangerous complications – hypocalcemia, reccurent nerve palsy etc. However, it is still unclear whether surgeon in training can perform thyroidectomy in a similarly safe manner as specialists of general surgery.

Aim of the study: The aim of the study was to assess safety of thyroidectomy performed by general surgery resident.

Material and methods: Data of 515 patients, who underwent thyroidectomy in 2nd Department of General Surgery Jagiellonian University Medical College (JUMC) between 9th January 2015 and 21st December 2017, were retrospectively analysed. Inclusion criteria were: patient who is > 18 age, underwent total thyroidectomy, during the surgery there were no change of operator. Patients were divided into groups: operated by general surgery specialist (385 patients – group 1) and operated by general surgery resident (130 patients – group 2). Exclusion criteria: patient who underwent total thyroidectomy with parathyroid gland removal, revision surgery.

Results: Demographic factors like age, BMI, sex, ASA scale, comorbidities did not differ statistically between groups. Mean operative time overall was 65 min (55-85 IQR) and 90 min (75-110 IQR) in groups 1 and 2 respectively ($p < 0.001$). Major complications – recurrent nerve palsy in laryngoscopy hematoma and trachea injury have occurred in group 1 in number 44 (11.39%) 1 and 14 (10.56%) in group 2 ($p = 0.789$). The main complication in both group was reccurent nerve palsy in laryngoscope – 39 (11.43%) in group 1 and 12 (9.23%), ($p = 0.754$). Postoperative hypocalcemia (calcium level < 2.15 mmol/l) occurred in 132 patients (34.29%) in group 1 and in 48 patients (36.92%) in group 2 ($p = 0.586$). Median length of hospital stay were 2 (2-3) days both in group 1 and group 2 ($p = 0.994$).

Conclusions: The results of the present study confirm that surgeries performed by general surgery resident are as safe as performed by specialist.

Key words: thyroidectomy, surgeon in training, complication, reccurent nerve palsy.

A cost-evaluation study on the use of negative pressure wound therapy with instillation (NPWTi) for salvage of infected implant-based breast reconstructions

Edward Bollen, Muholan Kanapathy

Tutors: Shameem Haque, Ibby Younis, Ash Mosahebi

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Introduction: Implant loss due to infection is the most devastating complication of implant-based breast reconstruction. The use of negative pressure wound therapy with instillation (NPWTi) for salvage of infected implant-based breast reconstructions has shown promising results to allow early reinsertion of a new implant as an alternative to current management of delayed reinsertion.

Aim of the study: This study compares the cost implication of NPWTi against current management of delayed reinsertion of infected breast implants.

Material and methods: 20 cases of an infected breast implant treated with NPWTi (V.A.C. VERAFLO™ Therapy) followed by early re-insertion of a new implant were compared with 20 cases who had delayed reinsertion (non-NPWTi). Average cost per person was calculated using total operative expenses, cost of inpatient stay, cost of investigations, cost of antibiotics, and cost of outpatient visits.

Results: Treatment with NPWTi allowed for earlier re-insertion of a new implant (NPWTi: 9.04 ± 2.92 days vs. non-NPWTi: 236.25 ± 123.89 days). The average cost per patient for NPWTi and non-NPWTi was £14,343.13 ± £2,786.70 and £8,920.31 ± £3,005.73 respectively. All patients treated with NPWTi had one admission and spent 11.9 ± 4.1days as an inpatient while non-NPWTi patints had 2.1 ± 0.3 admissions with total length of inpatient stay of 7.1 ± 5.8 days. Patients treated with NPWTi had more surgeries (NPWTi: 3.35 ± 0.81 vs. non-NPWTi: 2.2 ± 0.41), however 3 non-NPWTi cases required flap reconstruction. Patients treated with NPWTi had fewer total outpatient visits (NPWTi: 12 ± 6 vs. non-NPWTi: 14.2 ± 6.3).

Conclusions: Patients treated with NPWTi incurred higher average cost per patient, longer inpatient stay, and more procedures, however had early re-insertion of new implants, and fewer admissions and outpatient visits. A further study on patient reported outcome is essential to compare cost against patient benefit.

Key words: breast reconstruction, cost evaluation, infection, negative pressure wound therapy.

The assessment of usefulness abdominal and pelvic computed tomography in a diagnosing reasons of diffuse peritonitis

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Introduction: Diffuse peritonitis (DP) is burdened with severe prognosis and high mortality. Imaging methods, like computed tomography (CT) can diagnose causes of this condition. Despite many assets, CT's sensitivity can vary depending on many factors.
Aim of the study: The purpose of this study was to assess usefulness of CT in recognizing causes of the most severe DP with patients diagnosed with this condition on surgical emergency department.
Material and methods: The cases of 148 patients hospitalized with DP in the Emergency and Mass-Event Medicine Trauma Centre of the University Hospital in Cracow between 2013 and 2018 were analyzed retrospectively. 50 of them (33.78%) underwent a CT. Two cases were excluded due to lack of CT description. In cases of patient who underwent operation, CT description and intraoperative diagnosis were compared. Results were assigned to one of three groups: "recognition accordant with intraoperative diagnosis", "recognition partially consistent" or "recognition inconsistent". CT images partially consistent and inconsistent were retrospectively reviewed by a radiologist and reasons of inaccuracy were determined. Statistic calculation was assessed with t-student and chi-square tests.
Results: In 32 cases (66.67%) CT correctly recognized reason of DP. In 5 cases (10.42%) radiologic recognition was partially consistent with intraoperative diagnosis and in 11 cases (22.92%) CT didn't reveal real reason of patient's condition. Despite statistical significance in extended "admission time – operation time" in CT group, it didn't appeal to mortality or hospitalization period.
Conclusions: CT is useful tool in diagnostic reasons of DP. CT could help surgeons take a better decision on treatment strategy (laparotomy or laparoscopy). Correct diagnosis depends on many factors, like flow of clinically useful information between surgeon and radiologist. Application of intravenous contrast could possibly increase diagnostics value of CT of DP, but this thing should be expanded in next researches.
Key words: computed tomography, diffuse peritonitis.

Radiographic markers of frailty as predictors of 30-days mortality risk in emergency abdominal surgery

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Introduction: Clinical frailty scores are calculated using questionnaires and clinical examination. A lot of patients admitted to Emergency Department with acute abdomen are unable to cooperate in these. Many of them undergo Computer Tomography scans before the surgery, especially trauma patients. Data about sarcopenia, osteopenia, renal volume, atherosclerosis in aorta and sarcopenic obesity of acute patients obtained from CT scans may be more objective than clinical scales. The ideal radiographic marker of frailty in patients with acute abdomen is unknown. Moreover we evaluated patients with widely used frailty scales: Brief Geriatric Assessment (BGA) and modified Frailty Index (mFI).
Aim of the study: Our study aimed to investigate whether radiographic markers of frailty could predict 30-days mortality after abdominal surgery in emergency cases.
Material and methods: This is a retrospective study including patients who underwent emergency abdominal surgery between January 2017 and December 2018. The radiographic measurements of frailty markers were done under supervision of certified radiologist. Demographic data, comorbidities and surgical details were analysed. BGA and mFI scores were calculated if possible. Due to no guidelines of cut-off points of frailty markers we conducted Receiver Operating Characteristic curves. Univariate and multivariate regression models were used to identify risk factors for 30-days mortality. Inclusion criteria were as follow: age > 18, CT scans of the abdomen before surgery, emergency abdominal surgery. Exclusion criteria included: artefacts on CT scans, insufficient data.
Results: 131 patients were included in our study. According to 30-days mortality patients were divided into: no 30-days mortality – group 1 (106 patients) and 30-days mortality – group 2 (25 patients). Demographic characteristic were comparable between groups except age: median age in group 1 was 57.5 (IQR: 37-69) vs. 72 (IQR: 63-80) in group 2 ($p < 0.001$). For radiological frailty measurements ROC curves were conducted and area under curve, sensitivity and specificity were calculated. For 30-days mortality several risk factors were found in univariate analysis. However in multivariate analysis following factors were statistically significant: every point in ASA scale (OR: 30.145; 95% CI: 1.571-574.956), psoas muscle area standardized for height < 7.47 cm^2/m (OR: 101.729; 95% CI: 1.405-7363.336) and sarcopenic obesity < 2.93 cm^2/cm^2 (OR: 44.423; 95% CI: 1.349-1463.093). BGA and mFI scales were not statistically significant risk factors.
Conclusions: Radiological markers such as psoas muscle area and sarcopenic obesity can be used to assess 30-days mortality risk in patients operated for emergency abdominal reasons. Renal volume, osteopenia, atherosclerosis measured in CT scans, BGA and mFI scales were not significantly correlated to 30-days mortality.
Key words: emergency surgery, frailty syndrome, radiographic frailty markers.

Age differences in bariatric surgery results

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Introduction: Bariatric surgery is an effective method of treatment of obesity and its comorbidities. An important factor which classifies a patient for bariatric treatment and predicts the procedure's effectiveness is the patient's age.
Aim of the study: The purpose of study is to evaluate the outcomes of bariatric surgery with emphasis on differences between specific age groups of patients.
Material and methods: A total of 392 patients underwent sleeve gastrectomy in the Department of General, Minimally Invasive and Elderly Surgery in Olsztyn in 2013-2018 according to standard technique. Patients were surveyed during personal or telephone consultations. The research examined changes in patients' body weight 2 years after the surgery. Patients were assigned to two age groups, below and above 40 years old. Body mass index (BMI) and the percentage of excess body mass index loss (%EBMIL) were used to determine the results of obesity treatment.
Results: The follow up rate was 62,5%. The average BMI of 244 examined patients was equal to 43,87 kg/m^2 (σ = 6.06 kg/m^2). A significant decrease of BMI to an average of 29.83 kg/m^2 (σ = 5.55 kg/m^2) was noted in all age groups 2 years after the beginning of bariatric treatment. The BMI index determined for each group increased with the average age of patients. The average %EBMIL 2 years after the surgery determined for patients' aged below 40 years 83.91% (σ = 24.01) was substantially higher than in the group where patients were aged 40 or above 70.16% (σ = 25.70).
Conclusions: Bariatric surgeries are a good method of obesity treatment. The expected result of bariatric treatment decreases with the patient's age in short follow-up period.
Key words: sleeve gastrectomy, bariatric surgery, bariatric treatment, body mass index (BMI), excess body mass index loss (%EBMIL).

An assessment of the results of bacteriological examination and empiric antibiotic therapy in patients with diffuse peritonitis

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Introduction: Peritonitis is a severe systemic disorder with serious prognosis and high mortality. Bacterias play an important role in the course and prognosis of peritonitis. Precise identification of the microorganisms responsible for peritonitis and administration of correct treatment are essential when it comes to management of patient.
Aim of the study: The aim of this study was to analyze the results of bacteriological examination of patients with peritonitis. We wanted to assess the antibiotic resistance of microorganisms isolated from the peritoneal cavity during primary surgery. We also wanted to evaluate the usefulness of empirical antibiotic therapy in the treatment of peritonitis.
Material and methods: The retrospective analysis was carried out on 148 patients hospitalized due to peritonitis in the Department of General Surgery and Multiorgan Trauma of University Hospital in Cracow between 2013-2018. Laparotomy was performed in 145 patients. 83 patients (56.1%) had bacteriological examination. The fluid was taken just after opening the peritoneal cavity and sent for aerobic, anaerobic and mycological examination. The studied population was divided into two groups: in the first (A), patients' samples were sent to microbiological analysis. In the second group (B) there was no such analysis. Epidemiological and perioperative data were compared. The results of bacteriological examination were also compared between cured and deceased patients.
Results: There was no statistically significant difference between group A and B excluding Mannheim Peritonitis Index score. A total of 129 positive bacteriological findings were obtained (often more than 1 microb from 1 patient), including 102 bacteria and 27 fungi. There was a statistically significant difference in the species of microorganisms isolated from the patients who did not survive compared to the healed ones. Fungi and aerobic bacteria predominated in the dead and anaerobic bacteria in the healed ones. Moreover 21% of the results presented enterococci naturally resistant to carbapenems, so the empirical therapy used in these cases was ineffective or even harmful. Fungi were isolated from 12.2% of patients. In this group the mortality rate was 50%.
Conclusions: Microorganisms play an essential role in the pathogenesis and treatment of peritonitis. When the peritonitis occurs microbiological analysis of peritoneal fluid should be obligatory. The empirical therapy implemented at the beginning of the treatment is ineffective in 21%. For selected cases, empirical antifungal therapy should be considered.
Key words: peritonitis, microorganism, anitbiotic therapy.

Usefulness of imaging techniques in the diagnosis of peritonitis

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Introduction: Peritonitis is a severe disorder with serious prognosis and high mortality. Different imaging techniques are useful in determining the proper diagnosis. Correct interpretation of the results can reduce the number of deaths and complications.
Aim of the study: The aim of the study is to assess the usefulness of X-ray, abdominal ultrasound, abdominal and pelvic CT in the diagnosis of peritonitis.
Material and methods: The retrospective analysis is carried out on 148 patients admitted due to peritonitis in the Department of General Surgery and Multiorgan Trauma of University Hospital in Cracow between 2013-2018. 145 patients were operated: 99 patients underwent laparotomy, 21 laparoscopy, 25 patients underwent a conversion. 126 patients underwent imaging test on admission. The patients are divided into three groups. X-rays were performed in 59% of patients, CT in 34% and ultrasound in 12% of patients. Some of patients had several types of imaging tests. In this study we compare the waiting time, type of procedure and time of performing the procedure between these three groups.

Results: Subdiaphragmatic free gas was found in case of 24 patients. "Air-fluid levels" in the intestinal loops in 26, the presence of both free gas and fluid in 10 patients. In case of 10 patients with no changes in X-ray there were symptoms of perforation on CT scan. There was a statistically significant difference in the mean time from admission to surgery between the examined groups. The mean length of the procedure was comparable in all groups. The highest number of laparoscopies was performed after ultrasound (44.4%), the lowest after CT (22.55%).
Conclusions: Abdominal X-ray is the most common examination. It reduces the time between admission to hospital and surgery but has relatively low sensitivity compared to CT and ultrasound. Abdominal CT hasn't reduced the time of the procedures and has not reduced the number of laparotomies. In all of CT scans there were pathological changes not detected by X-rays.
Key words: peritonitis, X-ray examination, computer tomography, ultrasound examination.

Impact of working hours and weekend effect on surgical treatment for peritonitis

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Introduction: Night shifts and weekend effect can affect surgeon's performance in a bad way, increasing mortality or risk of complications after surgery. Peritonitis is an inflammatory process in peritoneum counted as acute abdomen – a state in which surgical intervention is often needed.
Aim of the study: The aim of the study was to compare postoperative outcomes and other healthcare aspects in patients admitted during night shifts or weekends with patients admitted during day shifts or weekdays respectively.
Material and methods: Patients' records were taken from the Emergency and Mass-Event Medicine Trauma Centre of the Jagiellonian University Hospital in Cracow from years 2013-2018. Patients' records were analyzed in terms of hospital admission's day of the week, hour, time between admission and surgery, time of an operation, APACHE II and MPI score, postoperative complications, intensive care unit stay and mortality.
Results: We found 125 cases, 52% of them were females, mean age was 67. There were no statistical differences in mortality, complications, time from admission to operation, duration of an operation, intensive care unit stay , APACHE II and MPI score between patients admitted in different hours nor weekdays versus weekends.
Conclusions: There were no differences in outcomes between patients admitted in different hours nor weekdays versus weekends. Possible explanation could be that peritonitis is a very severe condition and requires immediate and proper treatment despite various parts of the day or week. Another possible factor is that most of the admissions in Medicine Trauma Centre are urgent, so surgeons from that ward are experienced in such cases and weekend effect or night shifts won't affect their performance significantly.
Key words: weekend effect, peritonitis, night shift.

Assessment of certain thyroid nodules characteristics on ultrasonography as a predictor of malignancy

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Introduction: In recent years the significance of thyroid ultrasonography examination (USE) has been emphasized. USE provides physicians with information about thyroid nodules, such as their size, shape, vascularity, calcification, echogenicity, composition and margin [1].
Aim of the study: The aim of the study was to find out whether the presence of certain characteristics within thyroid nodules on USE was related with the histopathological type of thyroid cancer.
Material and methods: Retrospective analysis of 169 patients, who underwent USE of the thyroid gland, was performed. All of the patients underwent subtotal or total thyroidectomy in The Clinic of General, Gastroenterological and Endocrin Surgery in Wrocław. The relationship between each feature (size, shape, vascularity, calcification, echogenicity, composition and margin-based on USE) and the histopathological type (based on postoperative diagnosis) was established using percentage, χ^2 and Fisher test.
Results: Average age of a patient was 50,89 years (range: 16-89; SD = 16.97). Throughout the group of 169 patients, 267 thyroid nodules were investigated in USE in the terms of size, shape, vascularity, calcification, echogenicity composition and margin. According to the postoperative diagnosis 71% of evaluated nodules were malignant and 29% benign. The majority of the nodules was papillary cancer (122, 45.7%), followed by nodular goiter (27, 10.1%), colloid goiter (15, 5.6%) and others. Among all of the features evaluated on USE, correlation between eventual marker and malignancy was statistically significant in the group of hypoechoic nodules (low correlation – $\chi^2(1) = 5.55$; $p = 0.018$; V = 0.18) and group of nodules with microcalcifications (moderate correlation – $\chi^2(1) = 11.49$; $p = 0.001$; V = 0.31). All of the other variables were not significant.
Conclusions: The χ^2 test revealed that malignancy occurs more frequently when microcalcifications are present and the thyroid nodule is hypoechoic. Other features were not significant.
Key words: thyroid nodules, thyroid cancer, ultrasonography, endocrynological surgery.

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The relationship between the aneurysm wall structure and its rupture

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Introduction: The implications of intraluminal thrombus (ILT) in abdominal aortic aneurysm (AAA) are still unclear. Some scientists claim that ILT provides a biochemical advantage by decreasing wall stress, whereas other studies have associated ILT with aortic wall weakening and faster growth of the aneurysm. It is further unclear why some aneurysms rupture at much bigger diameters than others. In this study, we sought to explore the differences in aneurysm wall structure such as surfaces and volumes of ILT, atherosclerotic plaques and AFL.

Aim of the study: Determination of differences in the wall structure between ruptured and unruptured aneurysms.

Material and methods: 164 patients were retrospectively identified and categorized into three main groups: patients with ruptured aortic aneurysm (rAAA, 57) and unruptured which were divided into symptomatic (sAAA, 42) and asymptomatic (aAAA, 65). The groups of aAAA and sAAA patients were paired with the group of patients with rAAA in terms of maximal aneurysm diameter. Three-dimensional AAA anatomy was digitally reconstructed from computer tomography for each patient and in each aneurysm were distinguished the main 3 parameters: AFL (aneurysm flow lumen), ILT (intraluminal thrombus) and atherosclerotic plaques. Each of them was considered in terms of: volume (cm^3), minimum and maximum value, median, mean, standard deviation and surface (mm^2).

Results: In the group of rAAA compared with aAAA, a greater AFL volume was found (202.62 vs. 127.03 cm^3; $p = 0.0002$). AFL surface is bigger in rAAA than aAAA (24861.65 vs. 17186.07 mm^2; $p = 0.0006$). No statistically significant changes were found for the ILT volume and surface between groups. The atherosclerotic plaques volumes are greater in aAAA than rAAA (2.62 vs. 1.62 cm^3; $p = 0.0007$) but also in sAAA vs. rAAA (2.34 vs. 1.62 cm^3; $p = 0.0057$). The atherosclerotic plaques surfaces are greater in aAAA vs rAAA (2402.63 vs. 2044.12 mm^2; $p = 0.0011$) as well as in sAAA vs. rAAA (2402.64 vs. 2044.12 mm^2; $p = 0.0007$). The AFL/ILT volume is bigger in rAAA compared with aAAA (1.28 vs. 0.74 cm^3; $p < 0.0001$), the same with AFL/ILT surface (7.01 vs. 0.41 mm^2; $p < 0.0001$). sAAA have greater AFL/ILT volume compared with aAAA (1.32 vs. 0.74 cm^3; $p = 0.0125$) as well as AFL/ILT surface (0.46 vs. 0.41 mm^2; $p = 0.0339$).

Conclusions: The wall of rAAA differs significantly from an unruptured aneurysm. Those differences can contribute to the stratification of the risk of the aneurysm rupture. Greater volume of atherosclerotic plaques and smaller AFL seem to be protective against aneurysm rupture.

Key words: vascular surgery, aneurysm wall structure, aneurysm rupture.

Abdominal aortic calcifications as a risk factor of postoperative morbidity in older patients with colorectal cancer

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Introduction: The whole population is ageing. In next few years 1/3 of Polish society will be over 65 while the group of over 80 will double. Patients over 65 years old account about 50% of all emergent operations and slightly less than half of them suffer from postsurgical complications. The comorbidity and vulnerability of this group is much higher, while the natural reserves of the organism are decreased. Index of abdominal aortic calcification (AAC) might be used to evaluate the risk of postsurgical complications in the group of elderly patients. Significant extent of AAC is an independent risk factor of various diseases. AAC increases probability of mortality and morbidity at patients with cardiovascular diseases (CVD), especially in the group with chronic kidney disease. It was also proved that AAC increases risk of postsurgical complications, for example pancreatic fistula or anastomosis leakage.

Aim of the study: The main purpose of this research is to find out whether there is a correlation between the extent of AAC and risk of complication after surgery on large intestine, in the group of elderly patients.

Material and methods: Results come from 60 patients of the III Department of General Surgery UJ CM. All of the patients were over 60 years old. There were 35 man and 25 woman, divided in three age groups: < 70 (17 patients), 70-79 (22) and > 79 (21). According to Agatston method, the measurement is based on the preoperative computed tomography what is a part of a routine assessment. Calcifications are measured from celiac trunk up to the bifurcation. As a calcification might be considered every lesion ≥ 1 mm^2 and radiodensity ≥ 130 HU. Then the area is multiplied by proper value, depend on the radiodensity and by summing this results we receive the calcium score. The other results used in the analysis are: the percent of aortic area covered with calcification and the Agatston Score divided by the length of measured aorta.

Results: Results show that in AAC is slightly higher in male (30.63% of area covered with calcifications; SD = 10.16) than female (29.13%; SD = 10.80). In both genders AAC advances with age: group < 70 years old – 25.58 (SD = 8.88), 70-79 – 29.35 (SD = 9.42) and > 79 – 34.42 (SD = 11.21). There is also a noticeable difference in AAC between male who have suffered from postsurgical complication (34.07; SD = 12.08) and group without complication (28.47; SD = 8.42).

Conclusions: The AAC is a risk factor of postoperaitve morbidity in older patients and is easy to use element of preoperative risk evaluation in this population.

Key words: abdominal aortic calcification, elderly patients, colorectal cancer.

Characteristics of individual types of pancreatic cystic tumors and their treatment

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Introduction: Pancreatic cystic tumors (PCTs) account for 10–15% of pancreatic cysts and 1% of all pancreatic neoplasms.
Aim of the study: The aim of this study was to assess short-term outcomes of surgical treatment of pancreatic cystic tumors (PCTs) from 2014 to 2018.
Material and methods: We retrospectively reviewed medical records of 148 patients: 102 (69%) women and 46 (31%) men who had undergone surgery for pancreatic cysts in the Department of Gastrointestinal Surgery.
Results: Among 148 pancreatic cysts, 24 (16%) were non-cancerous and 124 (84%) were cancerous tumors. We have conducted further analysis of the PCTs. They were located within the pancreatic: tail 41 (33%), head 40 (32%), body 22 (18%) and other mixed regions 21 (27%). Histopathological tumor types were as follows: IPMN 45 (36.2%), MCN 30 (24.2%), SCA 28 (22.6%), CPEN 8 (6.5%), SPN 8 (6.5%) and other-mixed types 5 (4%). The following surgical procedures were performed: distal pancreatectomy with splenectomy 52 (41.9%), pancreatoduodenectomy 31 (25%) with Traverso 28 (23%), Whipple 2 (1.6%), Clagett 1 (0.8%) reconstructions, and distal pancreatectomy without splenectomy 12 (9.7%), and other procedures 29 (23.4%). Early postoperative complications were observed among 27 (21.8%) patients. Reoperations were performed in 15 (12%) patients. 11 (8.9%) patients required rehospitalisation. The perioperative mortality rate was 2.42%.
Conclusions: PCTs comprised most of pancreatic cysts in the analysed group. The most frequent histopathological type was IPMN. Most of the tumors were located in pancreatic tail. Distal pancreatectomy with splenectomy was the most common surgical procedure.
Key words: pancreatic cystic tumors, pancreas, surgical treatment, PCTs.

Pretreatment for pheochromocytoma removal – which drug should we use?

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Introduction: Pheochromocytoma is a rare catecholamine-secreting tumour associated with high hemodynamic instability during surgical treatment. To prevent life-threatening complications, preoperative α-blockade before adrenalectomy for pheochromocytoma is recommended.
Aim of the study: The aim of our study was to compare the efficacy of phenoxybenzamine (PXB) and doxazosin (DOX) for preoperative treatment of patients with pheochromocytoma who underwent laparoscopic adrenalectomy.
Material and methods: Retrospective analysis of consecutive 103 patients who underwent laparoscopic adrenalectomy due to suspicion of pheochromocytoma between September 2003 and October 2019 was performed. The diagnosis was confirmed histopathologically in 90 patients. According to pretreatment, patients were divided into two groups – receiving phenoxybenzamine (n = 60) and doxazosin (n = 30). Demographic and perioperative management were evaluated. Chi-squared test, unpaired t-Student test and Mann-Whitney U test were used to determine differences between studied groups.
Results: There were no statistically significant differences between PXB and DOX group with respect to age, sex, BMI, ASA scale and tumour characteristics (side of tumour, tumour size and PASS score). Median time of surgery was 90 and 80 min (p = 0.2) respectively. Median intraoperative fluids dosing was 1500 ml in both groups (p = 0.0147) and the total dose of transfused fluids during 24 h was 3000 and 2000 ml (p < 0.0001), respectively. Intraoperative blood pressure fluctuations did not differ between PXB and DOX group: episodes of blood pressure > 200 mm Hg occurred in 23.33% vs. 26.67% patients (p = 0.73) and > 160 mm Hg in 61.67% vs. 66.67% (p = 0.64), respectively. However, the need for using vasopressors during surgery was significantly higher in DOX than PXB group (30% vs. 10%, p = 0.0164). There was no significant difference in postoperative complications (p = 0.73).
Conclusions: Both doxazosine and phenoxybenzamine seem to provide adequate perioperative control in patients undergoing pheochromocytoma resection. However, further studies are needed to confirm these observations and create global recommendations for perioperative management of pheochromocytomas.
Key words: pheochromocytoma, adrenalectomy, pretreatment.

NK (natural killer) cells and lymphocytes in women, based on stage of gastric cancer

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Introduction: Natural killer (NK) cells are granular lymphocytes of the immune system which kill off both tumors and virally infected cells. Lymphocytes are white blood cells with the role of defending the body against foreign substances. Previous studies have shown that these cells can stimulate cancer cell apoptosis, prevent tumor growth or slow the growth rate. This study provides insight on how the amount and percent of NK cells and amount of lymphocytes changes in women, based on stage of gastric cancer.
Aim of the study: To determine the amount and percent of NK cells and lymphocyte count in women suffering from gastric cancer, based on stage.
Material and methods: This study involved patients with gastric cancer who were prepared for surgery and divided into stages based on early gastric cancer (stage I), locally advanced cancer (stages II and III), and cancer dissemination (stage IV). Total lymphocyte count and subpopulation of Natural Killer (NK) cells was measured via flow cytometry and assessment of these cells was performed using ADVIA 2120 hematology analyzer. The control group consisted

of 30 women. Statistical analysis was done via the Mann-Whitney U test and statistical significance was $p < 0.05$.
Results: The group consisted of 45 women, with a mean age of 65. 10 patients, with stage I, had a mean NK cell count of 236,7, NK cell percent of 13.15% and 2185 lymphocytes. It was noted that the BMI mean for these women was 27.4 and one woman lost more than 10% of her body mass. No difference was seen when compared to control group. 15 patients, with stages II and III, had a mean NK cell count of 225,65, NK cell percent of 13.7% and 1662,9 lymphocytes. The mean BMI for these patients was 26.6 and 3 patients had lost more than 10% of their body mass. There was a significant decrease in lymphocyte count when compared to control group ($p = 0.0354$). There was no difference in NK cell count and percent when compared to the control. 20 patients, with stage IV, had a mean NK cell count of 207,8, NK cell percent of 20.5% and 1465,6 lymphocytes. Both NK cell ($p = 0.0221$) and lymphocyte ($p = 0.0003$) count were significantly decreased when compared to the control group.
Conclusions: Patients with stages II and III demonstrated a decreased number of lymphocytes, while stage IV had a lowered number of both NK and lymphocyte cell count.
Key words: gastic cancer, lymphocytes, NK cells.

Influence of bronchoscopic interventions on post-transplant pulmonary function assessed by spirometry and 6-minute walk test – 1-year follow up

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Introduction: Lung transplantation (LTx) remains the only therapeutic option for patients with end-stage lung diseases. Such procedure significantly improves one's survival as well as pulmonary function (PF). Nevertheless, the operation is associated with airway complications (AC) which can affect the results of PF tests. Those complications must be treated by means of bronchoscopic interventions (BI).
Aim of the study: The aim of the study was to compare post-transplant pulmonary function in patients with and without airway complications in the first year after LTx.
Material and methods: Fifty patients, who underwent double LTx between January 2015 and March 2019 in Silesian Center for Heart Diseases were included in the study. In our research spirometry parameters (FEV_1, FVC, FEV_1/FVC) and 6-minute walk test (6MWT) were used to assess PF. To perform statistical analyzes, Shapiro-Wilk, the Mann-Whitney *U* and Student's *t*-tests were used. The assumed level of statistical significance of the results was $p < 0.05$.
Results: At 1-year follow-up point it was assessed that 46% of patients required at least one BI. Balloon bronchoplasty is the most commonly performed with a mean number of 6,78±5,89 per patient. The comparison of spirometry results among patients with/without BI due to AC are presented in the following order: [name of the parameter tested]: [patients with BI' mean results] vs. [patients without BI' mean results]; $FEV_{1\%}$: 54.4 ± 20.88 vs. 81.3 ± 26.9 ($p < 0.001$); FEV_1/FVC: 62 ± 32 vs. 78 ± 18 ($p = 0.004$); FVC 75.2 ± 19.3 vs. 87.85 ± 20.44 (p = 0.03). In 6MWT there was no statistically significant difference in the distance between BI and non-BI patients: 509.2 ± 100.7; 522 ± 79.7 respectively ($p = 0.625$) as well as desaturation after the test.
Conclusions: Patients who required BI in the first post-transplant year obtained worse spirometry results compared to those without any BI, however we do not observe any differences among achieved distance nor desaturation after 6MWT between studied groups. To decrease post-transplant PF deterioration we have to focus on reducing AC risk factors.
Key words: lung transplantation, pulmonary function, airway complications, bronchoscopic interventions, spirometry.

Efficacy of platelet rich plasma as a treatment modality for wound healing

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Introduction: Non-healing wounds come with cost and morbidity for patients and the society. Conventional therapies, such as dressings, surgical debridement, and even skin grafting, cannot provide satisfactory healing since such treatments are not able to provide the necessary growth factors to modulate the healing process. Platelet rich plasma is an effective method to directly feed growth factors to the mesenchymal tissue at the edges of the wounds in order to enhance healing.
Aim of the study: To analyze the efficacy of platelet rich plasma for the treatment of wounds.
Material and methods: A randomized controlled trial ($n = 60$), on patients with wounds having a surface area equal to or less than 10 x 10 cm^2 with 30 participants each, in the treatment group wherein they will be treated with autologous platelet rich plasma, infiltrated into wound edges i.e. into the mesenchymal tissue and the control group would be treated with conventional dressings (hydrogen peroxide and betadine). The patients were followed up on days 4, 8, 12, 15 and then 30.
Results: The median surface area of ulcer reduced from baseline measurement of 1710 mm^2 to 1583.5 mm^2 on Day 15 and 1478 mm^2 at the end of one month in control group and from 1421 mm^2 to 930 mm^2 on the Day 15 and 661 mm^2 at the end of one month in treatment group. Decrease in mean pain score in control group was from 8.4 to 6.3 while in the treatment group it decreased from 7.2 to 4.4 at the end of one month, it is postulated that platelet rich plasma may suppress cytokine release and thus inflammation resulting in decrease in pain. Study participants belonging to the treatment arm as many as 21 (62.5%) were observed to have healthy granulation tissue as early as Day 4 i.e. after a single infiltration of platelet rich plasma and by Day 15, all 30 study participants were observed to have healthy granulation tissue. On the other hand, it was observed that in the control group, a single patient had healthy granulation tissue on Day 4 and at the end of one month 24 patients showed healthy

granulation tissue. In our study, we found that in the treatment group, inflammation was present in as many 3 patients (10%) on Day 4 which rapidly declined and there was 100% resolution of inflammation on Day 8. In contrast, the control group had 18 patients (60%) who had inflammation, and which decreased to 4 (13.3%) at the end of one month. The rate of epithelization observed in the treatment group on Day 4 was 15 mm^2/day after which it reached a maximum of 84.43 mm^2/day on Day 15 and then began to decline to 19.56 mm^2/day at the end one month. On the other hand, the rate of epithelization in the control group was Day 4 and 12 was 0. On Day 12, it was observed to be 7.75 mm^2/day after which it reached a maximum of 37.93 mm^2/day and then began to decline to 9.95 mm^2/day at the end of one month. The mean rate of epithelization is 11.12 mm^2/day in control group, and it is 34.026 mm^2/day in treatment group. It was found that time required to reduce the surface area of the wound to half of its original surface area was 15 days for 5 wounds (16.66%) and 4 weeks for 9 wounds (30%) in treatment group whereas no such reduction was seen in the control group. There was a decrease in duration of hospital stay by 3.5 days. This difference can be attributed to conventional dressings being done daily and thus requiring patients to get admitted whereas the treatment group were subjected to PRP every 4 days.
Conclusions: It is concluded from the study that PRP is a safe and effective treatment modality and can be used as the primary approach to wound management irrespective of the etiology. All patients showed good compliance, because of decreased hospital stay, analgesic effects of PRP, elimination of surgical interventions, decrease rate of comorbidities such as lower extremity amputations, fastened rate of healing, decreased cost of treatment and no adverse reactions.
Key words: PRP, wound healing, efficacy.

Outcomes of multidisciplinary treatment of fibromatosis – retrospective analysis from a reference center

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Introduction: Fibromatosis is a non-metastasizing neoplasm with a highly unpredictable course. Surgery remains the mainstay in common practice. However, due to potential morbidity and high recurrence rates, in recent years more conservative management including watchful observation and non-steroidal anti-inflammatory drugs (NSAIDs) has been advocated.
Aim of the study: The study aimed to compare the outcomes of different treatment options for fibromatosis.
Material and methods: We retrospectively reviewed 258 patients (178 female, 80 male) who were diagnosed with aggressive fibromatosis between 1999 and 2018 and treated at Maria Sklodowska-Curie National Research Institute of Oncology in Warsaw. Kaplan-Meier estimator, long-rank test, Cox regression model, and Chi2 tests were used for statistical analyses.
Results: 123 patients (47.7%) underwent surgical resection and 103 (39.9%) were treated with NSAIDs alone in the first line. Remaining patients received chemo-/hormone- or radiotherapy. Disease recurrence or progression occurred in 91 (35.3%) patients – in 24.4% of patients treated with surgery and 45.6% with NSAIDs (p = 0.001). Location outside the abdominal wall (HR 2.8; 95% CI: 1.5-5.0) and active surveillance with NSAIDs in the first line (HR 3.6; 95% CI: 2.2-6.0) were independently associated with a higher risk of disease progression. 5-year disease-free survival rate was 65% in the whole population, 78% in treated with surgery, and 48% with NSAIDs. The objective response rate was 29.1% and disease control rate 81.5% in patients treated with NSAIDs. Considering the combination of first and second line together, the disease control rate was approximately 85% and was not significantly different in both groups.
Conclusions: Although surgery in the first line resulted in better control rates, we proved that watchful observation with NSAIDs allowed to avoid unnecessary surgery in a significant group of patients, especially with fibromatosis located in the abdominal wall. Surgery in the first line or active surveillance with NSAIDs followed by surgery after progression was associated with a similar disease control rate.
Key words: fibromatosis, desmoid, surgery, observation.

Predicting diabetes remission after bariatric surgery – comparison of DiaRem and DiaBetter scores

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Introduction: Bariatric surgery was proven to be the most efficient treatment of obesity and type 2 diabetes mellitus (T2DM). Despite detailed qualification, not every patient achieve desirable outcome of T2DM remission after intervention. Recently, new scores called DiaRem and DiaBetter have been developed to predict diabetes remission after bariatric surgery.
Aim of the study: The aim of the study was to validate and compare the performance of DiaRem and DiaBetter scores as the predictors of diabetes remission 1 year after surgical treatment.
Material and methods: The retrospective analysis included consecutive patients with T2DM who underwent Roux-en-Y gastric bypass (RYGB) or sleeve gastrectomy (SG) between 2009 and 2017 in a single tertiary referral center and completed 1 year follow-up. The DiaRem and DiaBetter scores were calculated for each patient. Each score relationship with diabetes remission was assessed using logistic regression. Discrimination was evaluated by area under the receiver operating characteristic (AUROC) whereas calibration by Hosmer-Lemeshow test.
Results: Out of 252 patients enrolled in our study 150 (59.5%) were women whereas 102 (40.5%) were men with median age 48 years. 46.83% of patients underwent SG whereas 53.17% of them had RYGB. The T2D remission rate reached 90.5%. Median of preoperative A1c was 6.75% and preoperative BMI was 45.39 kg/m^2, both decreased to 5.8% and 33.09 kg/m^2 respectively after 1 year. %EWL after surgery

amount to 53.4%. Either DiaRem or DiaBetter were predictive of diabetes remission in a logistic regression analysis (OR 0.83; $p < 0.0001$ and OR 0.51; $p < 0.0001$, respectively). The DiaBetter score presented excellent discrimination power (AUROC 0.81; $p < 0.0001$) whereas DiaRem had only acceptable discrimination (AUROC 0.78; $p < 0.0001$). Both scores demonstrated statistically good calibration.
Conclusions: Both DiaRem and DiaBetter scores can be used in preoperative assessment of diabetes remission after bariatric surgery. DiaBetter score seem to be more accurate than DiaRem score in predicting metabolic outcomes after bariatric surgery.
Key words: risk prediction scores, external validation, diabetes remission, type 2 diabetes mellitus, bariatric surgery, metabolic surgery.

Early mortality after pancreatectomy

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Introduction: Pancreatic cancer constitutes only 3.2% of all new cancer cases, however, it is the third most common cause of cancer-related deaths (according to SEER 2020). The course of the disease is unfavorable with 5-year overall survival equal 10% (according to SEER 2020), despite the introduction of combined regimens of adjuvant chemotherapy. Pancreaticoduodenectomy (PD) followed by adjuvant chemotherapy is the only way to cure the patient. In the past, the surgery was associated with mortality rates reaching 20-30%. Over time, the mortality decreased to below 5%, yet the morbidity still ranges between 38 and 44%, which is the highest among any gastroenterological cancer surgeries.
Aim of the study: The purpose of this study was to discuss the early mortality of pancreatic cancer patients treated with surgery and to raise a question is the surgery always a proper way of treatment.
Material and methods: The study group consisted of 104 patients who underwent pancreatectomy for histopathologically confirmed pancreatic adenocarcinoma between December 2007 and February 2018 at Department of General, Endocrine and Transplant Surgery, Medical University Gdansk, Poland. Preoperative history and early post-operative period were analyzed for all patients. NSQIP Calculator, Whipple-ABACUS and ASA scores were used to determine the patients risk of early morality after the surgery.
Results: Early post-operative mortality in the full group of 104 patients was associated with the higher scores in all three scores ($p < 0.05$). The detailed results will be presented during the conference.
Conclusions: Even though from oncological perspective patients seem to be operable, due to several comorbidities and general condition they will not survive the surgery. It is crucial to determine that subgroup of patients and discuss propose different treatment modalities.
Key words: pancreatic cancer, mortality, pancreaticoduodenectomy.

Case report

Reconstruction of scalp avulsion in a resource restraint rural hospital

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Introduction: Scalp avulsion results in grave consequences including loss of life, traumatic disfigurement, hospitalization, financial loss as well as psychological harm to the person. We present a case managed practically in a rural based hospital of a young girl, who had a complete scalp avulsion, and the challenges that were faced in a setting where microvascular surgery was not an option.
Case report: A young woman aged 20 years reports to the emergency department with an avulsed scalp. Her hair was trapped in the rotating part of the flour mill resulting in the avulsion, associated with loss of eyebrows & avulsion of pinna. Immediately resuscitation was started, and blood loss was controlled. Assessment of intracranial injury was done. Debridement was done, pinna was placed in proper anatomical position and scalp was split skin grafted. Recovery was satisfactory. She was given wig in place of natural hairs, eyebrows were penciled. She used large size spectacles. This helped to cover the deformity to the maximum and only forehead was visible. She later got married, had two children and went on to lead a normal life.
Conclusions: In a rural hospital where the limitations are set by the financial status, time as well as limited infrastructure and expertise to deal with microsurgery, split thickness skin graft is the preferred approach.
Key words: scalp avulsion, management, resource restraint.

Internal Medicine

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Case reports

Knowledge, attitudes, and practices regarding colorectal cancer screening in patients attending Kuwait Ministry health primary healthcare centers

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Introduction: Colorectal cancer (CRC) is a major public health concern, being the third most commonly diagnosed cancer after lung and breast cancer, and the fourth most common cause of cancer deaths worldwide. In Kuwait, the incidence of CRC is the highest among the gulf countries with an estimate of age standard rate to be 14.8 per 100,000 in 2009. In 2015, the Kuwait Ministry of Health implemented a CRC Screening Program. It targets Individuals between the ages 45 and 75years. CRC screening has the potential to prevent colorectal cancer both as Primary and secondary measure. CRC screening uptake among screening-eligible populations in Australia and USA was estimated to be about 59%, and between 48% to 63% respectively. In the Arab world, however, very few studies regarding the practice of CRC Screening have been published.
Aim of the study: To assess the knowledge, attitudes, and practices towards colorectal cancer, and its associated factors among patients attending Kuwait Ministry of Health Primary Healthcare Centers between the ages 45 to 75. To identify common perceived barriers to CRC screening using the structure of health belief model.
Material and methods: Study design and Participants: Design: cross-sectional study of participants from Ministry of Health Primary Healthcare (PHC) Clinics aged between 45 and 75 years old. Data collection instrument: either a self-administered questionnaire or by interview conducted by the data collectors (for those who had difficulty reading the questionnaire) regarding CRC screening knowledge, attitudes, and practices. Sample: 1130 participants from a total of 40 clinics. The study was approved by the Health Sciences Center Committee for Protection of Human Subjects in Research. Statistical Analysis: SPSS version 25 was used for data entry and all analyses. In assessing colorectal cancer screening in all participants, those who indicated having undergone CRC screening but then indicated they had the procedure because of symptoms were recorded as "0". This is because a procedure that is done. To investigate symptoms is regarded as a diagnostic test rather than a screening. procedure. Pearson's χ^2, χ^2 test for trend, and Fischer's Exact Test were used to measure significance of associations between categorical variables, as appropriate. Multivariable logistic regression was used to adjust associations of independent variables with CRC screening practice.
Results: The mean age was 53.7 ± 7.3 years, 62.1% were males, and 75% were Kuwaiti nationals. The prevalence of CRC screening was 5.4% [95% CI: 4.2-6.9%]. After adjustment, CRC screening was significantly associated with age > 60 years (OR = 1.96; p = 0.048), Kuwaiti nationality (OR = 3.53; p = 0.004), living in Al-Asimah or Hawalli (OR = 2.20, p = 0.019), education < high school (OR = 2.05; p = 0.046), household income < 500 KWD (OR = 3.82; p = 0.003), blood pressure measured in past two years (OR = 4.41, p = 0.042) and a history of any type of cancer (OR = 4.94, p = 0.001). Screening was significantly associated with knowledge regarding two symptoms (blood in stool and change in bowel habits) and obesity as a CRC risk factor. The most common reasons for not screening were doctors not recommending it (58%), belief that screening is painful/uncomfortable/ unpleasant (45%), and embarrassing (35.7%). Additionally, 67.7% of participants were willing to undergo CRC screening in the next 5 years.
Conclusions: The prevalence of previous CRC Screening is low and was associated with older age, Kuwaiti nationality, living in Al-Asima or Hawalli governorates; but not sex. Its association with income and education were not easily interpreted. Knowledge regarding CRC, its risk factors and its screening was in an intermediate range, and over half of the participants have heard about the Ministry of Health CRC screening Program. Willingness to undergo a CRC Screening in the next 5 years is relatively high. The most common barriers to screening were doctors not recommending it and thee belief that screening is painful/uncomfortable/unpleasant.
Key words: Colorectal Cancer (CRC) Screening Program, Kuwait Ministry Health Primary Healthcare Centers (PHC).

Milk intake and cardiovascular disease risk: a meta-analysis

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Introduction: Epidemiological studies to-date provided inconsistent findings on the effects of milk consumption and the risk of cardiovascular disease (CVD).
Aim of the study: The purpose of this review is to examine recent literature on the relationship between high and low milk consumption and the risk of CVD incidence and mortality for men and women above 34 years of age.
Material and methods: We performed a meta-analysis of prospective studies that looked at high and low milk consumption, all-cause mortality, coronary heart disease (CHD) and stroke incidence. Pertinent studies were identified by searching the Embase and Pubmed databases up to January 2020. Of 1017 titles evaluated, 18 met the inclusion criteria. There were 11,649 CHD, 6,853 stroke and 36,410 mortality cases. Random-effect model was used to combine the results.
Results: Analysis of the differences between high and low milk consumption did not find an association for decreased or increased risk of stroke (OR: 1.00; 95% CI: 0.89, 1.12), CHD (OR: 1.05; 95% CI: 0.94, 1.17), all-cause mortality (OR: 0.99; 95% CI: 0.87, 1.13).
Conclusions: This meta-analysis provided no further evidence supporting the beneficial or harmful effect of milk consumption and the risk of CVD.
Key words: milk, cardiovascular disease, stroke, coronary heart disease, meta-analysis.

Malnutrition and cognitive impairment among old hospitalized patients

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Introduction: Cognitive impairment has been identified as a one of the so-called 'geriatric giants' and is characterized by limitation in cognitive functions such as: thinking, memorizing, understanding or learning ability. Malnutrition is another problem of a great importance in old subjects with insufficient quality and quantity of food intake leading to serious diseases and treatment complications.
Aim of the study: The aim of the study was to check the frequency of malnutrition and cognitive impariment in a sample of old hospitalized patients. Additionally we aimed to examine if patients' nutritional status was correlated with their cognitive functioning.
Material and methods: The study was conducted from February to December 2019 in the Department of Internal Medicine and Geriatrics of the University Hospital in Cracow. 39 patients aged 65 years and more were included in a cross-sectional examination. The examination consisted of: a survey containing questions about demographics, comorbidities and drugs; anthropometric measurements with nutritional assessment using the Mini Nutritional Assessment (MNA) form; screening for cognitive impairment using the Mini Mental State Examination (MMSE); multimorbidity assessment using the Cumulative Illness Rating Scale (CIRS).
Results: Mean age of the study group was 77 (± 8.3) years, 69.2% women. Most of the examined hospitalized patients were at risk of malnutrition (41%) or already malnourished (12.8%). 33,3% of the patients suffered from cognitive impairment of varying severity. Mean CIRS score of the study group was 15.05 (± 4.3), the average amount of drugs and supplements used was 8.6 (± 5.7). Correlation analysis showed that poor nutritional status was associated with worse cognitive results ($p < 0.001$).
Conclusions: Malnutrition is a common problem among old patients. It is of a paramount importance in those being hospitalized as well as in old people with cognitive deficits. Screening for cognitive impairment should be recommended in those with poor nutritional status with introducing a balanced, rich in macro- and micronutrients diet with supervised nutrition in those with cognitive decline.
Key words: malnutrition, cognitive impairment, nutritional assessment, cognitive screening, dementia, diet.

The most common comorbidities in patient with pulmonary tromboembolisms and possible impact on mortality

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Introduction: Pulmonary thromboembolisms are very often associated with various comorbidities and they contribute to the development of PTE in a varying degree and can significantly affect the outcome.
Aim of the study: To determine which comorbidities accompany pulmonary thromboembolism and how they affect the mortality of patients with it.
Material and methods: The study included 356 patients with pulmonary thromboembolism who were admitted to the Emergency Medicine Clinic from September 2011 to September 2017, with an average age of 64 ± 11 years, of which there were more women (51%). They are divided into six groups based on their comorbidities (symptomatic vascular disease, surgery/trauma, psychoneurological diseases, malignancies, infections, chronic inflammatory diseases).
Results: Most patients were classified into surgery/trauma group (29.88%), while the least of them had an infection (11.24%). The highest mortality was in the group with malignant disease (23.49%), but this was not statistically significant ($p = 0.90$). Also, there was no statistically significant difference in mortality between healthy and those with one comorbidity ($p = 0.72$), while there was significant difference in those with one and two comorbidities ($p = 0.00017$), as well as between healthy and those with two comorbidities ($p = 0.0004$).
Conclusions: A large number of comorbidities accompany or cause pulmonary thromboembolism and also impair the survival of these patients. Therefore, it is important to pay attention to its prevention in all those who have at least one criterion of Virhov's triad fulfilled.
Key words: pulmonary thromboembolism, risk factor, comorbiditie, mortality.

Tacrolimus or cyclosporin – which one to choose after lung transplantation? Nephrotoxicity comparison

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Introduction: Lung transplantation (LTx) is the ultimate and life-saving treatment in end-stage lung dysfunction. Successful surgery is however just the first step of a lifelong process and the next milestone is to compose an appropriate immunosuppressive therapy. As per the guidelines, treatment should include three classes of drugs: a calcineurin inhibitor

(CNI), an anti-proliferative agent and a corticosteroid. Nowadays, the most commonly applied CNI is tacrolimus or cyclosporine.
Aim of the study: The study was conducted to assess the nephrotoxicity during immunosuppressive therapy with tacrolimus or cyclosporine in patients after lung transplantation.
Material and methods: This retrospective analysis includes 137 patients after lung transplantation hospitalized in Silesian Center for Heart Diseases (SCCS) in Zabrze in the years 2008-2019. The study embraces the five year post-transplantation period and the analysis is based on blood parameters – CNI concentration and glomerular filtration rate (GFR). The patients treatment was consisting of similar doses of an anti- proliferative agent and a corticosteroid while tacrolimus and cyclosporine doses varied.
Results: The glomerular filtration rate value decreases over the entire observation period. One month after LTx GFR was 88.12 ml/(min × 1.72 m^2); SD = 77.51 for patients applying tacrolimus and 80.33 ml/(min × 1.72 m^2); SD = 55.31 for applying cyclosporine (p = 0.52). After one year GFR was 56.69 ml/(min × 1.72 m^2); SD = 22.37 and 55.23 ml/(min × 1.72 m^2); SD = 24.71, respectively for tacrolimus and cyclosporine patients. Statistically significant difference was observed 2 years after LTx between comparative groups (for patients applying tacrolimus and cyclosporine): GFR = 55.63 ml/(min × 1.72 m^2) vs. GFR = 43.01 ml/(min × 1.72 m^2); p = 0.03.
Conclusions: The study reveals higher safety of tacrolimus administration contradistinctively to cyclosporine administration in immunosuppressive therapy after lung transplantation. What is also proved by this retrospective analysis, is the longer immunosuppressive therapy is applied, the more significant renal damage causes.
Key words: lung transplantation, tacrolimus, cyclosporine, GFR, nephrotoxicity, immunosuppressive therapy.

Clinical and laboratorial features assessment of first time hospitalized pituitary adenoma patients

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Introduction: Pituitary adenomas account for 15% of primary brain tumors and the majority are benign slow growing neoplasms. Radiologically pituitary adenomas can be classified as micro (< 10 mm) and macroadenomas (> 10 mm); clinically as functioning and non-functioning. Clinical manifestations are usually represented by endocrinological hypersecretion or hypopituitarism, and neurological symptoms due to mass effects. Magnetic resonance imaging (MRI) is the imaging modality of choice essential for accurate diagnosis and effective disease management.
Aim of the study: To assess clinical symptoms, laboratorial features in first time hospitalized pituitary adenoma patients and to evaluate main MRI findings.
Material and methods: Medical records of 64 first time hospitalized pituitary adenoma patients registered in Riga East University Hospital from 2018 to 2019 were retrospectively reviewed. Referral details, clinical and laboratorial features, radiological studies by MRI of the mass (size, invasion, optic chiasm relation) were analyzed. Statistical data was processed by IBM SPSS Statistics v23.
Results: Out of total 64 cases 35.7% (n = 25) were male and 55.7% (n = 39) female at the mean age of 54.4 ± 18.8 years. Based on MRI 58.6% (n = 41) of cases were macroadenoma; 32.9% (n = 23) microadenoma, respectively. 58.6% (n = 41) of pituitary adenomas defined as functioning; 32.9% (n = 23) non-functioning. 47.1% (n = 33) of patients admitted to the hospital with a headache; 48.6% (n = 34) presented with nausea. 42.9% (n = 30) of pituitary adenomas were prolactin secreting; 27.1% (n = 19) growth hormone secreting; 8.6% (n = 6) adrenocorticotropic hormone secreting. Varying degrees of visual disturbance were observed in 28.5% (n = 20) cases. The most common extra-sellar mass features were optic nerve atrophy (52.9%, n = 37) and infundibulum dislocation (34.3%, n = 24). A statistically significant association was found between macroadenomas and clinical manifestations of headache (p = 0.002), nausea (p < 0.001), visual disturbance (p = 0.004), laboratorial hormone secretion (p = 0.021) and radiological optic nerve atrophy (p < 0.001). Infundibulum dislocation correlated with diagnosis of prolactin secreting adenoma (p < 0.001).
Conclusions: Macroadenomas were associated with a broader spectrum of clinical manifestations (headache, nausea, visual disturbance) and laboratorial (hormone secretion), radiological (optic nerve atrophy) features.
Key words: pituitary adenomas, microadenoma, macroadenoma, MRI.

Association of HIF-1 alpha and beta subunits with PER1 and CRY1 proteins in obstructive sleep apnea patients

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Introduction: Obstructive sleep apnea (OSA) is a chronic condition that is characterized by intermittent hypoxia. Key regulator of oxygen metabolism is hypoxia inducible factor (HIF), which consists of oxygen sensitive subunit α and continuously produced subunit β. Circadian clock is composed of set of genes, which function as repressors – PER1 and CRY 1. Under hypoxia, HIF-1α heterodimerizes with HIF-1β and binds to E-box-like hypoxia response elements (HRE) in the promoter regions of hypoxia-induced genes, which include circadian clock genes such as PERs and CRYs genes.
Aim of the study: The aim of the study was to assess the relationship between HIF-1α, HIF-1β, PER1, CRY1, and polysomnography (PSG) variables in healthy individuals and severe OSA patients.
Material and methods: The study included 20 individuals, who underwent PSG and based on apnea-hypopnea index (AHI) were divided into severe OSA group (n = 10; AHI ≥ 30; 90% male) and healthy control (n = 10; AHI < 5; 70% male). All participants had their peripheral blood collected in the evening (9:00-10:00 pm) before and in the morning (6:00-7:00 am) after the PSG. HIF-1α, HIF-1β, PER1 and CRY1

protein concertation measurements were performed using ELISA.
Results: Significant difference was observed in the following protein measurements between study groups: evening and morning HIF-1α (p = 0.020 and p = 0.043, respectively), evening HIF-1β (p = 0.047), evening and morning PER1 (p = 0.004 and p = 0.029, respectively) and evening CRY1 (p = 0.035). No differences were observed between morning and evening protein levels in both groups. Evening HIF-1α correlated with evening and morning PER1 (R = 0.618, p = 0.004 and R = 0.514, p = 0.020, respectively) as well as morning CRY1 (R = 0.468, p = 0.038), while morning HIF-1α with evening and morning PER1 (R = 0.629, p = 0.003 and R = 0.471, p = 0.036, respectively).
Conclusions: There are significant differences in circadian clock proteins (PER1 and CRY2) concentration in OSA and control group, which suggests that OSA patients are in risk of circadian clock disruption, which might be mediated by HIF-1 subunits.
Key words: circadian clock, hypoxia, OSA.

The prevalence of secondary malignancies among patients with chronic myeloid leukaemia treated with tyrosine kinase inhibitors – a single-centre report

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Introduction: Chronic myeloid leukaemia (CML) is a clonal myeloproliferative disorder resulting from the formation of BCR-ABL fusion oncogene, which is constitutively active. The data about the prevalence of other secondary malignancies during treatment with Tyrosine Kinase Inhibitors (TKIs) among those patients is limited.
Aim of the study: This study sought to assess the incidence of secondary malignancies and describe baseline characteristics of CML patients treated with TKIs in a single institution.
Material and methods: The retrospective analysis of 234 patients from the Department of Hematology, Jagiellonian University Medical College suffering from CML treated with TKIs between 2009 and 2019 was performed. Demographic data and treatment details were analyzed. Statistical analysis was performed with StatSoft Statistica 12.
Results: The study included 234 (female – 47.9%) patients, in the mean age of 61 ± 16 years. Median follow-up time was 81 months (IQR 30-138). 122 patients (52.1%) were treated with one TKI, 79 (33.8%) with two TKIs, 25 patients (10.7%), 7 (3%) and 1 patient (0.4%) with 3, 4 and 5 TKIs respectively. Secondary malignancies were observed in 13 patients (5.6%): ovarian cancer (3 cases), uterine cancer, breast cancer (2 cases each), prostate cancer, thyroid cancer, rectal cancer, colon cancer, GIST and basal cell carcinoma (1 case each). Major molecular response (MMR) was achieved by 10 patients (77%) with secondary malignancies. There was no statistically significant difference between the frequency of secondary malignancies and number of TKIs used in therapy or MMR status. 4 patients were diagnosed with secondary malignancy before the onset of TKI treatment, 9 patients after TKI was introduced. Median time from the start of TKI regimen to secondary malignancy diagnosis was 80 months. None of the patients had neoplasm before CML diagnosis.
Conclusions: This study did not reveal a statistically significant difference between the number of TKIs used in therapy, MMR status achieved and the frequency of secondary malignancies among CML patients. Our study showed that female reproductive system cancers were the most common.
Key words: CML, TKI, secondary malignancies.

Sleep disorders and cognitive impairment among patients aged over 65 hospitalized in Geriatric Unit

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Introduction: Even though sleep disorders are one of the most common complaints of geriatric patients, they are often poorly adressed. According to the literature, many factors may contribute to the development of sleep problems, among others, cognitive disorders such as dementia.
Aim of the study: The aim of this study was to assess the prevalence of sleep disorders and cognitive impairment among elderly patients and to evaluate the possible associations between these two common geriatric problems.
Material and methods: The cross-sectional study was conducted between February and June 2019. We included patients aged 65 or more, hospitalised in the Department of Internal Medicine and Geriatrics UH in Cracow. In order to estimate cognitive impairment we used Mini-Mental State Examination questionnaire, while to assess sleep problems we used a scale consisting of four questions derived from the ISI (Insomnia Severity Index). The participants were questioned about difficulties with falling asleep, waking up at night, waking up too early and feeling too tired during the day (each question scored with 0-2 points). The analyzed patients were divided into two groups: I: (MMSE < 24; n = 13); II: (MMSE >= 24; n = 26).
Results: The study group consisted of 39 patients (12 male, 27 female). Number of patients with MMSE < 24 was 13 (33%) and with MMSE >= 24 was 26 (67%). The difficulties with falling asleep were reported significantly more often by patients in the group II (57.7% vs. 15.4%; p = 0.01). There was no significant difference between group I and II in the prevalence of complaints of the remaining spleep problems.
Conclusions: Considering the results of the study, sleep disorders and cognitive impairment seem to be interrelated sparsely. Patients with MMSE >= 24 were significantly more likely to report difficulties with falling asleep. This may suggest, that our four point ISI scale is not suitable for patient with dementia. To achieve more precise and statistically significant conclusions, however, the number of patients taking part in the study should be increased.
Key words: sleep disorders, dementia, geriatrics, mini-mental state examination, insomnia severty scale.

The Atherogenic Index of Plasma (AIP) as a possible simple diagnostic tool for an identification of insulin-resistant obese subjects at higher risk for arterial hypertension development – a preliminary study

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Introduction: The insulin resistance in obese patients with normal fasting glucose is associated with the accelerated atherosclerosis resulting in cardiovascular diseases development. The condition remains undiagnosed as the individuals are asymptomatic, and the insulin resistance assessment does not belong to routine medical procedures. A simple diagnostic tool for the identification of such patients is needed.
Aim of the study: Aim of the study was to investigate the relation of serum fasting insulin levels to the Atherogenic Index of Plasma (AIP) in two groups drawn from among 27 normotensive individuals with normal fasting glucose and elevated waist circumference (equaled to or higher than 94 cm in men and 80 cm in women).
Material and methods: One group of 12 subjects (3 men; 9 premenopausal women) was defined as having insulin-resistance and then compared with 15 subjects presenting normal sensitivity to insulin (5 men; 10 premenopausal women) matched for age (mean, 47.8 years), and body-mass index (31.6). All the individuals presented no subjective feeling of any disease, and admitted no drug treatment for any condition. Serum insulin levels were assessed by the enzyme-linked immunosorbent assay (ELISA). HOMA-IR index (the homeostatic model assessment) was used to estimate insulin resistance. Insulin-resistant participants were defined as HOMA-IR higher than 2.5. AIP defined as log[triglycerides/high-density lipoprotein-cholesterol] was calculated.
Results: The AIP was significantly higher in insulin-resistant subjects: 0.48 ± 0.17 vs. 0.36 ± 0.21; $p = 0.047$. Both systolic (132.8 ± 4.7 vs. 122.2 ± 8.7 mm Hg; $p = 0.002$) and diastolic (84 ± 3.7 vs. 76.5 ± 5.3 mm Hg; $p = 0.001$) blood pressures were significantly elevated in the insulin-resistant group. Systolic pressure values were positively correlated with HOMA-IR ($R = 0.55$, $p = 0.003$), and AIP ($R = 0.5$, $p = 0.008$).
Conclusions: The correlations between HOMA-IR, the AIP and blood pressure suggest that the AIP may be used as a simple diagnostic tool for an identification of insulin-resistant obese subjects who are at higher risk for arterial hypertension development. However, the conclusion should be confirmed in further studies on a larger group of patients.
Key words: The Atherogenic Index of Plasma (AIP), insulin resistance, HOMA-IR, normal fasting glucose, blood pressure.

The clinical characteristics of patients with myelofibrosis with and without JAK2V617F mutation

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Introduction: Primary myelofibrosis (PMF) and secondary myelofibrosis (MF) are rare (0.5-1/1000) neoplasms originating from clonal pluripotent stem cell proliferation with cell-derived increased level of cytokines, which initiate bone marrow fibrosis. Cardinal features include changes in peripheral blood cells count (most importantly severe – often transfusion-dependent – anemia and thrombocythemia or thrombocytopenia), bone marrow fibrosis, excessive extramedullary hematopoiesis and, as a result, massive hepato- and splenomegaly. JAK2V617F mutation is detected in substantial percentage (50-60%) of patients with myelofibrosis. There is still limited data about the detailed characteristics of those patients and the correlation between the presence of JAK2V617F mutation and different parameters among those patients.
Aim of the study: This study sought to assess the baseline characteristics of patients with primary and secondary myelofibrosis and the clinical significance of JAK2V617F mutation.
Material and methods: The retrospective analysis of 33 consecutive patients from the Department of Hematology, Jagiellonian University Medical College suffering from PMF or MF was performed. Data analysis of medical records was performed. Statistical analysis was performed using R software version 3.6.2.
Results: Mean age was 64.12 ± 11.74. There were 19 (57.58%) females. Thirteen (39%) patients were diagnosed with PMF, and remaining MF (post-PV: 11 patients (33%), post-ET: 9 patients (27%)). JAK2V617F mutation was detected in 20 (60.60%) patients. Splenomegaly was present in 25 (75.76%) patients at diagnosis. In one patient the splenectomy was performer prior to diagnosis of MF. On the last follow-up visit splenomegaly was present in 14 (42.42%) patients. There was no statistically significant difference in spleen as well as in the liver size (at first and at last visit) between JAK2-positive and JAK2-negative patients. Patients with and without JAK2V617F mutation did not differ significantly in laboratory parameters (Hb 11.07 vs. 10.55 [g/dl], $p = 0.46$; RBC 3.97 vs. 3.72 [$\times 10^6/mm^3$], $p = 0.39$; WBC 14.06 vs. 15.19 [$\times 10^3/mm^3$], $p = 0.82$). There was no significant correlation between age and the presence of JAK2V617F mutation ($p = 0.3361$).
Conclusions: Analysis of laboratory results and clinical characteristics of studied group of patients with primary and secondary myelofibrosis could not be used for prediction of the presence of JAK2V617F mutation.
Key words: myelofibrosis, JAK2V617F, clinical characteristics.

Evaluation of the relationship between quality of life and severity of chronic spontaneous urticaria and/or induced urticaria from patients seen at the HU-UFSC Allergy Outpatient Clinic

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Introduction: Studies show that about 0.1% of the population presents urticaria and that the cumulative prevalence rates vary between 15% and 20%. Urticaria is an elementary dermatological lesion characterized by the sudden appearance of erythemato-pruriginous papules consisting of central edema of varying size, associated itching and ephemeral nature, with the skin returning to its normal aspect hours after. Chronic urticaria is considered that which lasts for more than six weeks. This condition often compromises the patient by interfering in his daily activities, with loss of self-esteem and interpersonal relationships so that the impact on quality of life may not be directly related to its clinical severity, but to the stigmatization and discomfort caused. The outcomes reported by patients through validated questionnaires compose an essential tool for the evaluation and monitoring of urticaria activity, as well as its impact on the patient's quality of life. Therefore, this study aims to harmonize the analysis of emotional and physical factors, without considering them as separate aspects and aims to establish and qualify the relationship between the severity of expression of symptoms and quality of life of patients.
Aim of the study: Analyze if the emotional and physical factors (quality of life) of the patient interfere with the severity of expression of symptoms of urticaria.
Material and methods: Retrospective analysis from 2015 to 2019 of the urticaria activity score 7 (UAS-7) and dermatology life quality index (DLQI) questionnaires scores of 23 patients with chronic spontaneous urticaria and/or induced urticaria, totaling 61 pairs of scores. Descriptive statistics and statistical analysis were performed with chi-square test and Poisson's generalized linear log-linear model. The established significance level was $p < 0.05$. The study was approved/analyzed by the UFSC Human Research Ethics Committee.
Results: Of the 23 patients analyzed 14 (60.9%) were adults and 18 (78.3%) were female.The use of Poisson's log-linear model showed that for each one-point increase in the UAS-7 score there was a 6.4% ($p < 0.001$) increase in the DLQI score.
Conclusions: In agreement with the scientific literature, in relation to this group, a statistically significant relationship of important impact on the perception of the patient's quality of life was observed in the face of an increase in the activity of his disease.
Key words: urticaria, quality of life, allergy.

Histo-ultrastructural changes of the visual cortex in the long term course of experimental diabetes mellitus under conditions of chronic stress

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Introduction: Diabetes mellitus (DM) ranks first among other endocrine diseases worldwide. One of its complications is diabetic encephalopathy, which is diagnosed in approximately 80% of patients.
Aim of the study: The purpose of our research was to study the histo-ultrastructural rearrangement of visual cortex of rats on the 56th day of streptozotocin diabetes mellitus (SDM) under chronic stress.
Material and methods: 20 adult white male rats (weighing 180-200 g) were used for the study. All animals were divided into 4 groups: 1 group with modeled SDM and chronic immobilization stress, 2 group – animals with SDM, 3 group – with chronic immobilization stress, 4 group – intact rats. The material was collected on the 56th day after the beginning of the SDM simulation. Histological, electron microscopic, biochemical and statistical methods were used.
Results: In animals of 1st and 2nd groups the number of vacuolated and pycnomorphic neurons increases in 9.5-9.1 times and 1.5-1.4 times, respectively, on the background of a decrease of normochromic neurons in 2.8-2.3 times per 0.01 mm^2 of visual cortex. The glial index increases in 1.8-2.1 times, and the number of capillaries per 0.01 mm^2 decreases in 1.7-1.9 times. Such changes in the visual cortex occur on the background of the development of diabetic microangiopathy, which is manifested by: erythrocyte sludge, platelet adhesion and microthrombi in the lumen of microvessels; increasing of the wall area of capillaries while reducing the area of their lumen; thickening of the basal membrane; pericapillary edema of astrocyte processes. In rats of the 3rd group, in comparison with the 4th, the number of pycnomorphic neurons increases in 1.6 times on the background of a decrease of normochromic neurons per 0.01 mm^2 of the visual cortex.
Conclusions: Chronic immobilization stress worsens the course of SDM and contributes to the development of diabetic encephalopathy, which is diagnosed in the visual cortex of rats of the 1st and 2nd groups and morphologically manifests itself: an increased number of pycnomorphic and vacuolated neurons and decreased number of normochromic neurons. Such changes occur on the background of the development of diabetic microangiopathy.
Key words: visual cortex, diabetes mellitus.

Morphofunctional reorganization of blood vessels of the thyroid gland on the 28th day of experimental diabetes mellitus

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Introduction: The prevalence of diabetes is growing, if today there are about 425 million patients with diabetes in the world, in 2030 there will be about 620 million.
Aim of the study: The aim of our work was to study the morphofunctional changes of the thyroid gland (TG) in experimental diabetes mellitus (EDM).
Material and methods: The work was performed on 20 white outbred rats – males weighing 180-200 g 12 months of age, kept in standard vivarium conditions with all the ethical principles of animal experiments. EDM was simulated by a single intraperitoneal administration of streptozotocin (Sigma, USA) at a dose of 6 mg/100 g mass of the body.
Results: On the 28th day of the course of the EDM in the central departments of the thyroid gland, the follicles are mostly oval, and their lumen is filled with a colloid of dense consistency with more intense staining. The peripheral divisions of the gland are characterized by the presence of single deformed follicles. In perivascular spaces, single lymphocytes and phenomena of perivascular edema are present. Thyrocytes of some follicles are separated from the hemocapillary wall by strips of connective tissue that looks swollen and contains a dense amorphous component and separate collagen fibers. Arterioles spasm is observed in the vascular bed, which is confirmed by a probable 21.3% decrease in their lumen area and a 19.6% increase in the Wogenworth index ($p < 0.05$) compared to control values. The plasmolemma of the lumenal surface of the endothelial cells contains single microvilli, and the number of fenesters in the cytoplasmic regions is negligible. The basement membrane is unevenly thickened. The cytoplasm of endothelial cells contains a small number of mitochondria with partially reduced crystals and foamy vesicles. The area of venules increases by 10.7% due to their lumen, the area of which increases by 7.2% ($p < 0.05$).
Conclusions: The spasm of arteriol and venous filling is observed in the early stages of experimental diabetes.
Key words: thyroid gland, experimental diabetes mellitus, blood vessels.

Type 2 diabetes among the geriatric inpatients: is nutritional intervention needed?

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Introduction: Diabetes type 2 is a common disease among elderly subjects that coexists often with the most common geriatric syndromes, the so-called 'geriatric giants'. More than half of new diabetes cases are diagnosed among people aged 60 and over.
Aim of the study: The aim of the study was to assess the prevalence of type 2 diabetes among the patients hospitalized in a geriatric ward. In addition, nutritional status of the patients and their diet were assessed.
Material and methods: The study was conducted from February to December 2019 at the Department of Internal Medicine and Geriatrics of the University Hospital in Cracow. 71 patients aged 65 years and older were included in the study. The study comprised of the questionnaire with sociodemographic data and comorbidities, assessment of nutritional status using the MNA questionnaire and laboratory tests results, and the food frequency questionnaire (FFQ).
Results: The mean (SD) age of the examined subjects was 82.52 (± 9.44) years. 67.6% of the respondents were women. The mean (SD) BMI of the participants was 25.91 (± 4.81) kg/m^2, 19 (26.7%) patients were malnourished or at risk of malnutrition based on the MNA questionnaire. The average index of healthy diet of the subjects was 21.58 (± 8.64). 21 (29.6%) of the examined patients had type 2 diabetes mellitus. The mean (SD) age of diabetes mellitus type 2 patients was 83.14 (± 8.12) years, their mean (SD) BMI was 27.3 (± 3.88) kg/m^2. 14 (66.7%) of these patients were overweight or obese, 9 (42.3%) were malnourished or at risk of malnutrition. The average index of a healthy diet of the subjects diagnosed with diabetes was 21.88 (± 8.57). Hypertension (61.9%), dyslipidemia (38%) and kidney disease (38%) were the most common health problems in the group of patients with type 2 diabetes. The most common gastrointestinal symptoms reported in this group were constipation (52.4%), diarrhea (38%), swallowing problems (33.3%), abdominal pain (33.3%).
Conclusions: Due to the high prevalence of type 2 diabetes and associated comorbidities, poor quality of diet and the risk of co-occurrence of obesity and/or malnutrition, tailored dietary intervention seems reasonable in the group of hospitalized elderly patients.
Key words: diabetes, nutritional intervention, diet quality.

Non-HDL-C and non-HDL-C/HDL-C ratio are risk factors of the metabolic syndrome

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Introduction: Impaired lipoprotein metabolism is an inherent feature of the metabolic syndrome (MetS). Non-high-density lipoprotein cholesterol (non-HDL-C) reflects total concentration of proatherogenic molecules and emerges as one of the most potent cardiovascular risk factors. Recently, its clinical significance has been emphasised in ESC 2019 guidelines on management of dyslipidaemias, determining non-HDL-C concentration as a secondary target of the recommended therapy.
Aim of the study: The aim of the study was to investigate lipid parameters' alterations in men suffering from the MetS.
Material and methods: The study group consisted of 62 males fitting IDF 2005 metabolic syndrome criteria, while

70 individuals without MetS were recruited to the control group. All participants were aged 40-70 and were inhabitants of Lubusz province. Lipid parameters, including low- and high-density lipoprotein cholesterol (LDL-C and HDL-C), total cholesterol (TC) and triglycerides (TG), were measured twice and averaged. Non-HDL-C concentration was calculated as the difference: TC – HDL-C.
Results: Concentrations of non-HDL-C (median 210 mg/dl vs. 191.5 mg/d; $p = 0.0009$) and TG (median 188.5 mg/dl vs. 100.5 mg/dl; $p < 0.0001$) as well as LDL-C/HDL-C (median 4.02 vs. 2.86; $p < 0.0001$) and non-HDL-C/HDL-C (median 4.95 vs. 3.15; $p < 0.0001$) ratios were significantly elevated in the study group compared to the controls. In addition, non-HDL-C was highly correlated with LDL-C (rS = 0.92; $p < 0.05$) and moderately with TG (rS = 0.54; $p < 0.05$), while LDL-C showed only a mild correlation with TG (rS = 0.24; $p < 0.05$). Furthermore, univariate and multivariate regression analysis established non-HDL-C/HDL-C and LDL-C/HDL-C ratios as the most potent and independent risk factors of the MetS occurrence (OR = 3.005, 95% CI– = 2.017, 95% CI+ = 4.476 and OR = 2.765, 95% CI– = 1.830, 95% CI+ = 4.177 respectively; $p < 0.0001$).
Conclusions: Non-HDL-C and non-HDL-C/HDL-C ratio are strongly associated with the MetS and seem to be better parameters than LDL-C and LDL-C/HDL-C ratio for the MetS risk assessment.
Key words: metabolic syndrome, non-HDL-C, non-HDL-C/HDL-C ratio.

Weight gain and BMI increase after the switch from tenofovir disoproxil fumarate (TDF)- to tenofovir alafenamide fumarate (TAF)-containing treatment regimen in HIV-positive ART-experienced group

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Introduction: Tenofovir alafenamide fumarate (TAF) along with tenofovir disoproxil fumarate (TDF) belong to the group of antiretroviral drugs, specifically nucleoside reverse transcriptase inhibitors. TAF compared with TDF showed non-inferior antiviral properties and its use is correlated with lower nephrotoxicity risk and lower decrease in bone mineral density. However, several minor reports and doctors' practice suggest that treatment with TAF-based regimen may be associated with higher weight gain and increase of BMI compared with TDF-based regimen.
Aim of the study: To determinate whether TAF-based treatment compared with TDF-based treatment is associated with weight changes in HIV-positive adult cohort.
Material and methods: Analysis of data gathered between 2014 and 2020 in Infectious Diseases Hospital in Warsaw was conducted and two groups of patients were distinguished. The first group consisted of patients whose only one agent of therapy was changed – TDF replaced with TAF ($n = 32$). The second group consisted of patients whose therapy was changed in general meaning from TDF-based to TAF-based regardless of other agents ($n = 68$).
Results: In the first group the mean duration of TDF-based therapy reached 20.0 (± 13.79) months, while the mean time on TAF-based regimen reached 26.8 (± 6.5) months. The weight of patients between the first and the last measurements on TAF-based regimen increased significantly by mean 3.06 kg ($p = 0.0449$). The mean increase of weight on TDF-based regimen was insignificant and reached 0.03 kg. In the second group the durations of TDF-based and TAF-based regimens reached respectively mean 29.8 (± 11.0) and 26.8 (± 7.0) months. Similarly, the mean weight gain during the TAF-based regimen turned out to be significant and reached 2.46 kg ($p = 0.0053$), while the mean weight gain on the TDF-based regimen was insignificant and reached 1.74 kg.
Conclusions: Comparing TAF-based regimen with TDF-based regimen, the one based on TAF might be correlated with weight gain in this analyzed group.
Key words: HIV, NRTIs, tenofovir alafenamide fumarate (TAF), tenofovir disoproxil fumarate (TDF), weight.

Blood flow restricted training stimulating angiogenic – a break through in post-interventional rehabilitation of peripheral arterial disease patients

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Introduction: Peripheral artery disease (PAD) is a non-cardiac atherosclerosis manifestation affecting over 20% of Europeans aged 55 and above. Best treatment option of non-critical lower limbs ischemia remains the open case. Among many treatment forms, the most non-invasive, but still effective is rehabilitation by physical training. Recently, innovative solutions have been introduced concerning this form of treatment by combining anaerobic interval exercises with venous blood flow restriction (BFR) and cooling.
Aim of the study: The aim of the research is to evaluate the endothelial and angiogenic response to the aforementioned type of exercise.
Material and methods: Study was divided into 2 stages: with healthy volunteers and non-CLI patients. 35 healthy volunteers were enrolled into the 1st stage. They performed a 21-minute interval training using a cross trainer with cooling liquid pressure cuffs (arms: 40 mm Hg; legs: 65 mm Hg) providing vein occlusion and cooling seat. Angiogenic processes and endothelial functions were monitored by laboratory parameters – vascular endothelial growth factor (VEGF), clusters of differentiation (CD31, CD34) as well as imaging examinations – flow mediated dilatation (FMD), stiffness index (SI), reflexion index (RI), reactive hyperaemia index (RHI) and augmentation index (AI). All measurements were performed before, as well as 20 to 30 minutes after the training.

Results: All of the laboratory parameters were significantly elevated after the training – CD34 (0.031 vs. 0.371, $p < 0.0001$), CD31 (9.61 vs. 10.71, $p < 0.0001$) and VEGF (32.20 vs. 39.62, $p = 0.0002$). Moreover, physical training resulted in RI (69.52 vs. 65.37, $p = 0.013$) and SI decrease (7.60 vs. 7.12, $p = 0.024$) and increase of FMD (6.49% vs. 9.12%, $p = 0.01$). AI and RHI remained influenced by exercise.
Conclusions: BFR training successfully stimulates acute angiogenic response and moderately influences certain endothelial functions. This 1st stage results are being now implemented into the 2nd part of project involving PAD patients.
Key words: peripheral artery disease, blood flow restricted training, endothelial response.

Enactment of renin–angiotensin–aldosterone system inhibitors in patients with Covid-19, DEBATABLE!

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Introduction: It is still questionable that, whether the enactment of renin–angiotensin–aldosterone system (RAAS) inhibitors is risk-realted or favourable in patients who are Covid-19 positive, because the receptor of virus is angiotensin-converting enzyme 2 (ACE2).
Aim of the study: ACE2 is the functional receptor to SARS-CoV-2, the virus responsible for the Covid-19 pandemic, so the aim is to study whether RAAS inhibitor, is favourable or risk related?
Material and methods: Evaluation was made in between foregoing treatment with (beta-blockers, angiotensin-receptor blockers, thiazide diuretics or calcium-channel blockers) and possibility of serious disease among individuals who were positive for Covid-19. Making use of Bayesian method, and then comparing the results in patients who received treatment with these medications and in patients who does not(untreated patient), there was a divergence seen not less than 10 percentage points.
Results: A history of hypertension was observed in 4357 patients, among which 2573 were positive for Covid-19. So there was no interconnection seen in between any of these medications and rising likelihood for being positive for Covid-19. Moreover NO solid increase was in visualization related to the medications and hazards of severe illness who tested positive for Covid-19.
Conclusions: No notable increase in relation with 5 common classes of antihypertensive in Covid-19 patient.
Key words: risk, corona virus, drugs, widespread, assessment.

Case reports

Acute pancreatitis due to auto urine therapy (AUT)

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Introduction: Using one's own urine as a potential cure for many diseases has been practiced all over the world for millennia. Nowadays, complementary and alternative medicine (CAM) are gaining popularity due to common access to the Internet. Auto urine therapy (AUT) is the use of urine either orally, topically, or as an enema.
Case report: The 55-year old man was admitted to Internal Medicine Ward because of acute pancreatitis presented with upper abdominal pain and bile vomiting without blood. He was on a vegetarian diet and denied regular intake of alcohol. The patient did not have any chronic illnesses and was not taking any drugs on a regular basis, but he had a history of acute pancreatitis five years ago prior to this hospitalization. The patient admitted to the usage of urine enema periodically. Furthermore, the patient has been on a starvation diet that lasted for a whole week multiple times in the past. The patient underwent treatment with a rigorous diet, administration of diastolic drug – drotaverine, and intravenous administration of fluids (0.9% NaCl solution and polyelectrolyte liquid), which caused the improvement of his condition. During hospitalization CRP increased to 43.3 mg/l so the decision was made to additionally treat the patient with ceftriaxone. In the end the patient went home in good general condition with iron supplements prescription, for anemia presented during hospitalization, and proper dietetic recommendations.
Conclusions: Alternative medicine can be really dangerous and lead to life-threatening situations. In the case of this patient the auto urine therapy (AUT) lead to acute pancreatitis. Nowadays due to common access to the Internet alternative, self-made treatments are becoming a big problem for healthcare professionals. This case report is an example that more attention should be drawn to the problem of self-proclaimed alternative medicine experts and their treatments.
Key words: pancreatitis, auto urine therapy, alternative medicine.

Central retinal vein occlusion in a diabetic patient – a case report

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Introduction: Central Retinal Vein Occlusion (CRVO) is one of the major causes of marked or total loss of vision in middle aged and elderly population. We present a case of Uni-

lateral Ischemic CRVO in a 54 year old man with a history of uncontrolled diabetes. The Patient was given Bevacizumab (Avastin) Intravitreal injections. Patient was advised to follow during next six months including gonioscopy and Undilated examination of Iris to find any neovascularization of Iris/disc. Our case illustrates an interesting presentation of unilateral ischemic CRVO where diabetes is thought to be main risk factor.

Case report: A 54 year old male presented to the eye clinic with decreased and blur vision in the left eye. There were No Redness, Swelling and Pain are observed. The patient had a history of uncontrolled diabetes mellitus and used to take Glimepiride initially and taking Glimefirst M1 (combination of Glimepiride and Metformin 1) as medication now. The General Examination showed normal vital signs. Ophthalmologic exam showed visual acuity of 20/20 in right eye and 20/63 in left eye. Pupil reaction showed sluggish reactive pupil in left eye. Intraocular pressures were 16 mm Hg in right eye and 14 mm Hg in left. Fundus examination of left eye showed normal cup to disc ratio and dilated tortious retinal veins with intra retinal hemorrhages and of right eye showed otherwise normal optic disc and flat macula. Color Fundus photograph of the left eye showed superficial opacification of the retina in the macular area in combination with multiple dot-blot and flame-shaped hemorrhages in all four quadrants (Figure 1). Fluorescein angiogram of left eye showed blocked venous fluorescence from retinal hemorrhages extensive areas of capillary nonperfusion vessel wall staining (Figure 2). In the given macular thickness OCT, all the 9 parameters were far more raised than the normal values which is in macular edema (Figure 3). Results of Laboratory tests of patient are represented in (Table 1). The patient was prescribed with bevacizumab (Avastin) Intravitreal injections. He was also suggested to combigan, brimolor, vigamox, flarex for better control. Patient was followed up for next six months including gonioscopy and undilated examination of Iris to find any neovascularization of Iris/disc. Differential diagnosis includes Occular ischemic syndrome, Diabetic retinopathy, papilledema, Radiation retinopathy and Retinopathy due to anemia.

Conclusions: Our Case Illustrates an interesting presentation of Unilateral Ischemic Central Retinal Vein Occlusion (CRVO) where diabetes is thought to be main risk factor.

Key words: bevacizumab, central retinal vein occlusion (CRVO), diabetes, fluorescein angiogram, unilateral ischemic CRVO.

Providing the best immunosuppression when the most typical options cannot be selected – a case report

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Introduction: Crohn's disease is an idiopathic autoimmune disease that affects various parts of the gastrointestinal tract. It may lead to numerous complications, including colorectal cancer. Since the therapy of Crohn's disease consists mainly of immunossppresion, treatment of any concurrent malignancy is always a challenging task for a physician.

Case report: We report a case of a 60-year-old man with an 8-year-long history of Crohn's disease (it began in 2012, when he was 52). Between June 2017 and January 2018, the patient received infliximab. However, his clinical state deteriorated and he underwent abdominoperineal resection of the rectum. The histopathological examination revealed rectal T-cell lymphoma. The patient received 8 cycles of CHOP regimen chemotherapy. In a control PET scan in October 2019, metabolically active lymph nodes in the II level of the neck on the left side were detected. The patient underwent lymphadenectomy and the histopathological examination showed reactive lymphadenopathy. In November 2019, the patient experienced a Crohn's disease exacerbation. He received mesalazine and methylprednisolone. Unfortunately, the disease was steroid-dependent. After hematological consultation, methotrexate as an immunosuppressant was prescribed and the patient was released home. In early June 2020, he returned to our department with an even worse exacerbation. The patient admitted not having administered methotrexate due to the global panic caused by the COVID-19 pandemic. After the inpatient methotrexate course, the exacerbation was partially resolved and the patient was discharged home.

Conclusions: The presented case proves the potential effectiveness of methotrexate in resolving the symptoms of Crohn's disease in a patient with a previous history of a rare malignant complication, which is a T-cell colorectal lymphoma. The symptoms alleviated, but complete remission was not achieved. We suppose it could be caused by the therapeutic delay. Therefore we emphasize the need for contact with patients during pandemics to consult their potential doubts.

Key words: Crohn's disease, T-cell lymphoma, immunosuppression, global panic.

Severe hypokalaemia and diabetes decompensation as a nonspecific first signs of ACTH-dependent ectopic Cushing's syndrome

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Introduction: ACTH-dependent ectopic Cushing's syndrome is a group of symptoms associated with hypercortisolemia caused by chronic ACTH synthesis by hormonally active extrapituitary tumors. Most often these are small cell lung cancers, rarely carcinoid tumors. Untreated Cushing's syndrome poses a threat to the patient's life or health.

Case report: A 60-year-old female patient was admitted to the hospital due to persistent hypokalaemia and diabetes decompensation which resulted with hyperglycaemia. During three weeks of hospitalization in another hospital, metabolic disorders could not be clarified or managed, therefore the patient had been referred to the Department of Endocrinology of the hospital with the third referral level. In a physical

examination, symptoms were discreet: slight fat deposits on the back of the neck and fine atrophy of the muscles of the shoulder girdle and buttocks. Hormonal tests revealed elevated levels of ACTH and cortisol, also the lack of circadian rhythm of cortisol secretion. There was also no inhibition of cortisol secretion by dexamethasone. The test performed with CRH did not show a significant increase in ACTH concentration. These results enabled making the diagnosis of ACTH-dependent Cushing's syndrome. The patient was referred for CT of the chest, abdominal cavity, and adrenal glands. Imaging studies revealed a left lung tumor suspected of endogenous ACTH release. To confirm the diagnosis bronchofiberoscopy and somatostatin receptor scintigraphy were done. The patient was given metyrapone, which after a few days significantly reduced cortisol levels. The treatment included potassium supplementation and multiple daily insulin injections. Insulin requirements have decreased during treatment of hypercortisolemia. The patient was discharged in good general condition with no absolute indications for insulin therapy.
Conclusions: Slight symptoms of the disease were probably the cause of difficulties with making a diagnosis by non-endocrinology specialists. Therefore, it seems important to ensure the fast diagnosis of Cushing's syndrome not only in endocrinological units but mainly in the internal medicine departments of smaller hospitals. When meeting a patient complaining of uncontrolled metabolic disorders, it is worth looking for the characteristic clinical features of Cushing's syndrome and then referring patients for hormonal and imaging tests.
Key words: Cushing's syndrome, ectopic ACTH secretion, ACTH-releasing tumor, diabetes decompensation, severe hypokalaemia.

Turner syndrome and diabetes mellitus: is it a coincidence?

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Introduction: Turner syndrome (TS) is a disorder caused by complete or partial loss of a single X chromosome. TS is associated with a significantly increased risk of autoimmune diseases, whereas coincidence of type 1 diabetes (T1DM) has been rarely reported. The pathogenetic mechanism justifying DM occurrence in this syndrome is still not well characterized.
Case report: A 27-year-old female with TS and hypothyroidism was reported due to 1-month history of polyuria and polydipsia with weight loss of 20 kg during past 3 months. The diagnosis of new-onset diabetes was based on two fasting blood glucose tests: 150 mg/dl and 174 mg/dl. HbA_{1c} was 8.9%. A positive family history of diabetes was not found. The patient was referred to the diabetology department for a comprehensive diagnostic. Dietary therapy was initiated and proper glycemic control was accomplished. Further investigations were done: abdomen ultrasound was normal and there were no deviations in liver function tests. Due to lack of insulin requirement, suspicion for clinical remission in the course of T1DM was maintained. A Glutamic Acid Decarboxylase (GAD) autoantibodies test was performed to confirm a diagnosis of T1DM.
Conclusions: The coexistence of abnormal glucose metabolism in patients with TS is not uncommon, but linked factors, which could contribute to insulin resistance and glucose intolerance are unclear. Ultimately, awareness of increased susceptibility to autoimmune diseases and possible underlying impaired pancreatic beta cells function make diagnostic challenges for clinicians. This case highlighted complexity associated with the distinction between pathophysiology pattern of T1DM and T2DM, especially in patients with genetic disorders such as TS. On the other hand, it has been suggested that pathogenesis of DM in this group of patients could be similar to the mature-onset diabetes of the young (MODY). Despite that GAD antibodies test is recommended for all TS adults with new-onset diabetes to increase the likelihood of setting a proper diagnosis.
Key words: Turner syndrome, genetic disorder, other specific types of diabetes.

Diagnostic difficulties of multi-organ disorders, as an example of comprehensive looking at the patient despite clear primary symptoms

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Introduction: We will present the case of a patient with multi-organ disorders, who was admitted to the department of internal medicine.
Case report: A 46-year-old patient with hypertension was admitted to the department of internal medicine because of extreme anemia: Hb 2.7 g/dl, Ht 8.3%. In addition, thrombocytopenia reached 79000, leukocyte counts – 9720 (normal). The mean corpuscular volume indicator – 133.9 fl. A week earlier the patient suffered from an injury, which resulted in a fracture of the VI rib on the right side and an injury to the thoracic spine. On admission, the patient was in a severe general condition, lying, with limited verbal contact and no apparent bleeding. Reported weakness in sensation and movement in the lower extremities. Immediately after admission, 4 units of packed red blood cells group 0 Rh + were transfused. A number of diagnostic tests were carried out to determine the cause of severe anemia. Decreased iron (36.2 µg/dl) and vitamin B_{12} (119.4 pmol/l) were confirmed, no autoantibodies or immune alloantibodies to red blood cell antigens were found, cold negative agglutinins were tested. In addition, gastroscopy was performed – reflux esophagitis was found. No colonoscopy was performed due to the patient's serious condition. Considering all clinical symptoms and test results of the study, mixed anemia was diagnosed. During hospitalization, sepsis of the etiology of *Escherichia coli* strain ESBL developed, which was treated with antibiotic-targeted therapy. Due to the progressive disturbances in the superficial sensation and movement of the lower extremities, two sections of the spine were performed: cervical and thoracic. Post-traumatic and degenerative confirmed. Spinal cord with the correct signal. During follow-up, the patient's condition was stable, with no decrease in morphology in control tests. Based on imaging tests and clinical symptoms, advanced sensorimotor polyneuropathy was

diagnosed and the patient was transferred to the neurology department.
Conclusions: Diagnosis of a patient in a severe clinical condition is complicated and requires the cooperation of many specialists. However, it should be remembered that the main symptoms may mask other diseases. Therefore, it is important to always carry out detailed diagnostics of such a patient.
Key words: multi-organ disorders, extreme anemia, sepsis, advanced sensorimotor polyneuropathy.

Late-presenting accidental glacial acetic acid ingestion

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Introduction: Glacial acetic acid 70%, called 'essence of vinegar', was used to pickle food in Latvia and other northern European countries. In 2010, the Latvian government prohibited its sale due to safety concerns. It was replaced by vinegar (9% acetic acid). Ingestion of glacial acetic acid causes severe upper gastrointestinal (GI) corrosive injury which can be fatal.
Case report: A 68-year-old woman was transferred from a district hospital to the Toxicology and Sepsis Clinic of Riga East Clinical University hospital (RECUH). While intoxicated, the patient mistook a bottle of glacial acetic acid for alcohol, which she accidentally ingested. She realised her mistake but was embarrassed and did not seek immediate medical attention. Two days later, the patient presented to a district hospital with ongoing throat pain and oliguria. She was referred to RECUH primarily to treat acute kidney failure (Cr = 522 umol/l). Upper GI endoscopy showed stage-3B corrosive injury of the oesophagus and stomach. Renal replacement therapy, requiring heparinization, was commenced. However, intermittent GI bleeding developed from this. Parenteral feeding was commenced to facilitate healing of her GI injury. As the patient suffered from stage-3 chronic cardiac insufficiency, a significantly positive intravenous fluid balance resulted in acute pulmonary oedema. Treatment for this produced hypernatraemia (193 mmol/l). Further intravenous fluids to normalise serum sodium resulted in repeated episodes of pulmonary oedema. The electrolyte imbalance did not respond to therapy and the patient's condition continued to worsen. She died from acute neurologic injury and multi-organ failure on the 25th day of hospitalization.
Conclusions: Earlier presentation to hospital and initiation of therapy, in this case may have resulted in a better outcome. Although glacial acetic acid has been banned in Latvia, it is still found in many homes. Accidental ingestion may be devastating, require prolonged treatment for severe GI injury and result in chronic GI scarring. Mortality from secondary injury such as GI perforation, septicaemia, multi-organ failure is common.
Key words: glacial acetic acid, essence of vinegar, corrosive injury, electrolyte imbalance.

Acute liver failure caused by mushrooms poisoning: case report

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Introduction: Intoxication with mushrooms can rapidly lead to acute liver failure and sudden death in previously healthy individuals. It requires fast and proper treatment.
Case report: A 18yo patient present to Emergency Department with abdominal pain, fatigue, vomiting, diarrhea after mushrooms poisoning. Hepatic dialysis was performed after diagnosis of acute liver failure but it was not effective, therefore patient was transferred to Bucharest for liver transplant. The patient was in not favorable conditions before emergency surgery and transplant. After therapy he completely recovered and now he can live a normal life.
Conclusions: Liver transplant is often the only treatment in young patients with fulminant hepatic failure with unfavorable prognosis. Development of faster protocols in identification of mushrooms intoxication is needed in clinical practice to avoid misdiagnosing.
Key words: acute liver failure, liver failure, mushrooms poisoning, food intoxication.

Diabetic patient with unobvious gastroenterological complaints

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Introduction: The proper course of type 1 diabetes mellitus (T1DM) is closely related to the patient's education in terms of adequate insulin therapy and possible complications of the disease. This group of people is at higher risk for epileptic seizures and complications in the alimentary system such as autoimmune gastritis. The principal gastroenterological complaints linked to the manifestation of the disease include abdominal pain, diarrhea, nausea and vomiting. However, diabetic patient may only complain of difficulties in reaching normoglycemia and numerous recurrent episodes of hypoglycemia.
Case report: A 31-year-old male was admitted to the diabetology department with 3-months history of large daily glycemic fluctuations (40-460 mg/dl) and two seizures associated with severe hypoglycemia last week. He had T1DM since the age of eleven, currently treated with a biphasic insulin analogue. The patient's past medical history included cerebral palsy and epilepsy diagnosed 10 years ago. On admission, the patient reported a weight loss of 10 kg, increasing weakness during past 6 months and gastroenterological complaints (recurrent empty reflections, periodic nausea and vomiting, epigastric pains) started a year ago. His random blood glucose level was 366 mg/dl. Laboratory studies revealed severe megaloblastic anaemia and leukopenia. Urine test detected glucosuria without acetonuria. Further diagnostics showed: vitamin B_{12} deficiency, high serum iron concentration, whereas folic acid

concentration was normal. Moreover, gastroscopy revealed chronic inactive gastritis in the antrum of the stomach, without *H. pylori* infection. Multiple-dose insulin injection therapy was initiated. Treatment with intramuscular vitamin B_{12}, oral iron and folic acid, produced brisk reticulosis, with a subsequent rapid resolution of the anemia.

Conclusions: This case demonstrated the complexity involved in maintenance of proper glycemic control in a patient with other coexisting diseases that may have a relevant impact on the course of the diabetes. Severe hypoglycaemia resulting from gastroenterological disorders deteriorate epilepsy control. It evolved into patient's anxiety and significantly reduce the quality of life.

Key words: type 1 diabetes mellitus, autoimmune gastritis, epilepsy.

Cardiology, Invasive Cardiology and Cardiosurgery

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List of papers:

Case reports

Morphofunctional changes of the endocrine system of the heart in streptozotocin diabetes mellitus

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Introduction: Nowadays, diabetes mellitus (DM) with its prevalence, continuous growth, complications and mortality occupies the leading position among other diseases in the world. Patients with type 1 DM have a 3-5 times higher risk of developing cardiovascular diseases and death, than general population.
Aim of the study: The purpose of our study was to investigate the features of structural rearrangement of secretory atrial cardiomyocytes (SAC) in streptozotocin DM (SDM).
Material and methods: 24 adult white male Wistar rats (body weight 180-200 g) were used for the study. All animals were divided into 2 groups: control (10 animals) and experimental (14 animals with SDM). The SDM was simulated by a single intraperitoneal administration of streptozotocin "SIGMA" (USA), which was diluted in 0.1 M citrate buffer with pH 4.5 (6 mg per 100 g of body weight). The control group got a single intraperitoneal injection of 0.1 M citrate buffer with pH 4.5. Material sampling was carried out on the 14 and 56 days after the SDM simulation. Histological, histochemical, electron microscopic, biochemical and statistical methods were used.
Results: On the 14th and 56th days of the experiment, the glucose and HbA_{1c} levels in the blood of experimental rats increased in 2.8-4.4 times and 3.6-6.1 times, respectively, with the level of insulin decreasing in 2.8-4.4 times, indicating the development of decompensated DM. In early stages of the development of SDM (14 days) on the background of hyperglycemia, there was an increase in the morphofunctional activity of SAC, which was confirmed by an increase in the bulk density of secretory granules in them due to all their forms, especially diffusing, indicating enhanced processes of synthesis, secretion and excretion of atrial natriuretic peptide (ANP) from the cells. The level of the latter in the blood have increased in 2.2 times. On the 56th day of SDM, a decrease in the secretory activity of SAC due to the development of their destructive-atrophic changes is observed, which is accompanied by a decrease in the level of ANP in blood to 88.32 ± 5.13 pg/ml. In our opinion, changes in SAC are related to circulatory and hemic hypoxia, which is a consequence of the development of diabetic microangiopathy.
Conclusions: In the dynamics of morphofunctional changes of the endocrine system of the heart in SDM 2 stages can be distinguished: compensatory processes (14th day), destructive and atrophic changes (56th day).
Key words: secretory atrial cardiomyocytes, streptozotocin diabetes mellitus.

Differences in clinical profile between male and female patients with dilated cardiomyopathy

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Introduction: Dilated cardiomyopathy (DCM) mostly affects male (M) young adults. It is known that there is lack of precise data on sex distribution in DCM cohorts.
Aim of the study: Analysis of differences in terms of clinical, laboratory, echocardiographic parameters and HF therapy between M and F patients with DCM.
Material and methods: Between 2010 and 2018 we retrospectively analysed in- and outpatients records of 406 consecutive DCM patients. The follow-up data were collected by phone contact in 2019.
Results: Out of 406 DCM patients 76 were F (18.7%). F and M (aged 54 ± 15 vs. 54 ± 13 years, $p = 0.7$) did not differ significantly in terms of clinical presentation: duration of symptoms(32 ± 48 vs. 42 ± 60 months, $p = 0.3$), NYHA class (2.6 ± 0.9 vs. 2.5 ± 0.9, $p = 0.6$), presence of diabetes mellitus (17% vs. 23%, $p = 0.2$), atrial fibrillation (24% vs. 34%, $p = 0.1$), prior stroke (4% vs. 6%, $p = 0.4$) or dyslipidemia (68% vs. 67%, $p = 0.8$). F and M did not differ in terms of: left ventricle diameter (35.1 ± 5.8 vs. 33.8 ± 5.9 mm/m^2, $p = 0.03$), ejection fraction (27.7 ± 9.4 vs. 25.7 ± 9.4%, $p = 0.12$) and tricuspid annular plane systolic excursion (18.7 ± 5.3 vs. 18.4 ± 6.4 mm, $p = 0.42$. F had smaller right ventricle (indexed diameter: 34.4 ± 8.4 vs. 38.7 ± 8.7 mm^2/m^2, $p < 0.001$), left (indexed area: 26.2 ± 8.1 vs. 30.2 ± 8.3 cm^2/m^2, $p < 0.001$), right atria (indexed area: 18.5 ± 5.4 vs. 24.2 ± 8.4 cm^2/m^2, $p < 0.001$) and serum NT-proBNP level (3533 ± 6051 vs. 3693 ± 7941 pg/ml, $p = 0.8$). Nearly all patients received optimal HF therapy: beta-blockers (F vs. M 94.7% vs. 97.6%, $p = 0.2$), renin-angiotensin-aldosterone inhibitors (F vs. M – 88.2% vs. 91.8%), aldosterone receptor antagonists (F vs. M – 86.8% vs. 88.2%, $p = 0.3$) and resynchronisation therapy (F vs. M – 3.9% vs. 3%, $p = 0.8$). More M used digoxin (14% vs. 28%, $p = 0.02$). During 48 ± 32 months death occurred in 70 (17.2%) patients. There were no differences in outcome between F and M: death (13.2% vs. 18.2%, $p = 0.3$), heart transplant (2.6% vs. 3.3%, $p = 0.75$), left ventricle assistant device implantation (1.3% vs. 1.8%, $p = 0.76$).
Conclusions: Male and female did not differ in terms of most clinical parameters, left ventricle function and size, NT-proBNP level and most HF treatments. Male had larger right ventricle and both atria. There were no differences in terms of outcome between those groups.
Key words: dilated cardiomyopathy, echocardiographic parameters.

Comparison of the characteristics of primary percutaneous coronary interventions (pPCIs) performed during daytime vs night shift in patients with acute myocardial infarction (AMI)

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Introduction: pPCI is the treatment of choice in patients with AMI. Optimally performed PCI significantly reduces myocardial injury. Therefore, it is important to ensure the equal quality of day/night procedures.

Aim of the study: The aim of the study was to compare the pPCIs during day and night shifts with a focus on the technical aspects, considering the experience of clinicians and suggesting reasons for the discrepancies/similarities.

Material and methods: All patients who underwent pPCI due to AMI between 01.01.2019 and 30.06.2019 at the 2nd Department of Cardiology, Jagiellonian University in Cracow were analyzed in a retrospective, single-centre study. Patients were divided into group A with interventions performed between 8 a.m. and 8 p.m. and group B (8 p.m. – 8 a.m.). Clinical characteristics of the patients and periprocedural data: vascular access, procedure time, contrast volume, radiation dose, number of stents etc. were analyzed. Clinicians conducting pPCIs were classified into four categories based on their experience.

Results: In 144 patients (106 in A, 36 in B) of mean age 69.1 (A) and 67.6 (B) STEMI was diagnosed in 40% of patients in group A vs 55% in B, NSTEMI in 58% (A) vs. 34% (B). The lesion distribution pattern in coronary arteries was similar in both groups. The mean time of diagnostic coronarography was significantly shorter in A (28.5 ± 12.24 vs. 23.8 ± 8.88 in B). In both groups in patients with NSTEMI diagnostic coronary angiography was significantly longer as compared to STEMI patients. There were no statistically significant differences in other periprocedural parameters. Higher experience of clinicians correlated with shorter duration of the procedures.

Conclusions: The characteristics of patients undergoing day/night PCI were similar. Most differences between technical aspects of interventions are negligible. Our results suggest, that the course of PCIs (and probably their quality) is not affected by the time of intervention. However, some differences between periprocedural parameters of PCIs correlating with the experience of clinicians might require further research. Studies on larger groups of patients are needed to confirm our results.

Key words: primary PCI, acute myocardial infarction, day/night shift, STEMI, NSTEMI.

Comparison of frequency and types of therapeutic cardiac procedures in patients with obstructive and non-obstructive hypertrophic cardiomyopathy

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Introduction: Hypertrophic cardiomyopathy (HCM) is an inherited myocardial disease, characterized by increased left ventricle (LV) thickness (≥ 15 mm), that is unexplained by abnormal loading conditions. Based on left ventricular outflow tract (LVOT), HCM can be classified as non-obstructive (HNCM) with LVOT < 30 mmHg or obstructive (HOCM) with LVOT ≥ 30 mmHg. HCM is a heterogeneous disease, with a variable pathology and clinical course. Some HCM patients may require advanced therapeutic cardiac procedures, either interventional and surgical.

Aim of the study: The aim of our study was to: a) compare the frequency of therapeutic cardiac procedures in HNCM and HOCM group; b) compare the frequency of different types of those procedures in HNCM and HOCM group.

Material and methods: We included 249 consecutive HCM patients, enrolled between 2011 and 2019; 140 (56.22%) with HNCM and 109 (43.78%) with HOCM, 136 (55%) males, aged 55.49 ± 14.66 years, in mean NYHA class 1.8 ± 0.8. The clinical data were obtained retrospectively from the hospital/outpatients records and a telephone follow-up.

Results: The frequency of therapeutic cardiac procedures was 21.43% (30) in HNCM group vs. 29.36% (32) in HOCM group; $p = 0.15$. The most frequent types of procedures were: implantable cardioverter defibrillator (ICD) implantation (17, 56.67% in HNCM vs. 12, 37.50% in HOCM; $p = 0.05$), ICD re-implantation (4, 13.3% in HNCM vs. 3, 9.4% in HOCM; $p = 0.05$) and septal myomectomy (0, in HNCM vs. 6, 18.76% in HOCM; $p = 0.05$). Less common were valve replacement (1, 3.33% in HNCM vs. 4, 12.50% in HOCM; $p = 0.05$) and percutaneous coronary intervention (1, 3.33% in HNCM vs. 3, 9.38% in HOCM; $p = 0.05$).

Conclusions: There was no statistically significant difference in the frequency of therapeutic cardiac procedures between two groups. The most frequent procedure in both groups was ICD implantation. The second most frequent procedure in the HNCM group was ICD re-implantation and in the HOCM group it was septal myomectomy, which is the procedure dedicated for patients with obstructive form of HCM.

Key words: hypertrophic cardiomyopathy, therapeutic cardiac procedures.

Risk factors for contrast-induced nephropathy in patients with acute myocardial infarction undergoing staged percutaneous coronary intervention – a retrospective observational study

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Introduction: One of the critical factors associated with the safety of percutaneous coronary intervention (PCI) is the risk of contrast-induced nephropathy (CIN). A multivessel intervention requires administering an additional dose of contrast. Thus, identifying high-risk patients is of clinical importance.
Aim of the study: The aim of our study was to search for factors associated with an increased risk of developing CIN in patients with myocardial infarction undergoing a two-stage PCI during index hospitalization.
Material and methods: We retrospectively analyzed medical records of 139 patients admitted with an acute coronary syndrome and diagnosed invasively with multivessel coronary artery disease, in whom two consecutive PCIs were performed, separated by an average interval of 3 days. Clinical, echocardiographic and biochemical characteristics were recorded. Each patient had creatinine levels measured 3 times: (1) before 1st intervention, (2) within 72 h after 1st intervention (before 2nd intervention), (3) within 72 h after 2nd intervention. Dependent variables were: changes of creatinine levels and diagnosis of CIN (according to KDIGO criteria). Comparisons were performed by 2-tailed Fisher test and Student's *t*-test (or Welch test in case of variance inhomogeneity). Multiple regression was used to identify associations between changes in creatinine and patient's characteristics.
Results: Patients with significant LV systolic dysfunction (EF < 36%, $n = 20$) exhibited higher relative rises in creatinine levels after 2nd intervention (17 ± 29% vs. 2 ± 16% for EF < 36% and ≥ 36%, respectively, $p = 0.035$). The association between low EF and relative creatinine changes after 2nd PCI was maintained upon adjustment for baseline GFR, age, diabetes status and concurrent use of ACEI ($p < 0.001$). CIN frequency after 2nd intervention was 5-fold higher in subjects with low EF (28% vs. 5%, $p = 0.007$).
Conclusions: Low EF predisposes to CIN after second contrast exposure in patients undergoing two-stage PCI. Our findings may suggest a need of preventive measures or even postponing of second PCI in patients with LV dysfunction.
Key words: contrast induced nephropathy, multivessel coronary artery disease, myocardial infarction, two-stage revascularization, ejection fraction.

Hybrid-surgical strategies in mitral and pulmonary Melody valve implantations – multi-institutional experience

Julia Haponiuk

Tutors: Assoc. Prof. Ireneusz Haponiuk MD, PhD, Maciej Chojnicki MD, PhD, Konrad Paczkowski MD, PhD

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Introduction: One of the main challenges of the present-day pediatric heart valve surgery is the lack of the commercially available artificial, or biological prostheses designed for pediatric implantations. Stented bovine jugular vein graft (Melody valve) was originally designed for percutaneous implantations in pulmonary position in adult patients, while mid-term results after mitral Melody valve replacement in children are promising. The main advantages of Melody prosthesis are perfect hemodynamics with favorable effective orifice area (EOA) index, low transannular gradient, and finally – a unique potential for percutaneous transcatheter balloon dilatation following the growth of the pediatric patient.
Aim of the study: The aim is to present a brief report of three consecutive unique hybrid-surgical strategies in mitral and pulmonary Melody valve implantation.
Material and methods: The first two patients presented with a history of rapid deterioration in the course of acute endocarditis. The children aged 23 months-old/12 kg bw and 15 months-old/8 kg bw were operated on directly after an initial preoperative antibiotic treatment because of large mitral incompetence and deteriorating vegetations into mitral valve apparatus, with echocardiographic view of leaflets disruption and chordae discontinuation. After initial attempts for mitral plasty the hybrid methods of self-modified Melody valves implantation into the mitral positions (Melody-MVR) were used with good early, and mid-term results. However, the third 9 years-old patient presented with previous multi-institutional history of neonatal persistent truncus arteriosus (PTA) type II surgical repair and a percutaneous implantation of 2 stents into the pulmonary trunk ostia and continuum and a Melody valve into the pulmonary position. Due to an incidental obstruction of the right pulmonary artery, the patient was reoperated in the emergency settings. After the resternotomy the impeding stent from the pulmonary trunk was removed, with perfect Melody valve function preservation, followed by hybrid intraoperative balloon plasty of both pulmonary arteries and the pulmonary trunk contegra closure.
Results: This unique and original hybrid procedure was applied with a good early result.
Conclusions: To conclude, with regard to actual knowledge concerning heart valves reconstructions and presented institutional experience, altered heart valves in children should be primarily repaired, nevertheless self-modified Melody valve could be reasonably considered as mitral and pulmonary prosthesis in non-reparable pediatric valvular insufficiency.
Key words: Melody valve, pediatric mitral valve replacement, acute endocarditis, pediatric Melody valve pulmonary implantation, pediatric cardiac surgery, hybrid treatment.

Student's ability to interpret ECG and sources of the knowledge

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Introduction: Making a diagnosis based on ECG recording may be challenging. There are several methods to became fluent in making ECG-based diagnosis. However, it is not clear which method or combination of methods has the highest effectiveness.
Aim of the study: The aim of our study is to estimate medical student's ability of making ECG-based diagnoses and find out which method is the best in terms of learning.
Material and methods: A total of 756 students from 20 universities in Poland completed online simple survey based on Google Form. The majority of the participants were medicine students (83.4%, n = 631) with mean stage of the studies 3.85 ± 0.71 years. The form consisted of 9 short test questions showing basic ECGs, with 4 distractors and only one good answer. The participants were also asked about the studying form.
Results: The mean overall score was 57.2% (5.15 ± 2.12). The most popular way of getting knowledge were classes at the university (65.3%, n = 494) followed by books (63.8%, n = 483), voluntary lectures (44.8%, n = 339), summer practice (40.6%, n = 307), web pages (31.2%, n = 236), workshops (21.6%, n = 163), YouTube videos (19.6%, n = 148), shadowing during voluntary duties (16.7%, n = 126). The mean number of knowledge sources was 3.5 ± 2.12. The analysis showed higher scores in ECG interpretation in students at the end (5th and 6th year) of studies (p < 0.001). Higher scores in ECG interpretation were observed after teaching during physiology, pathophysiology, cardiology and internal medicine (p < 0.001), with no impact of biophysics (p = 0.46). The sources of knowledge showing statistical difference with higher score in ECG interpretation were books (p < 0.001), presentations from classes (p = 0.01), summer practices (p < 0.001), shadowing during voluntary duties (p < 0.001), faculties (p < 0.001), web pages (p < 0.001), medical journals (p < 0.001), but there were no differences between ECG interpretation score and lectures (p = 0.24), YouTube movies (p = 0.15) and mobile applications (p = 0.09). Additionally, the analysis showed that more sources of knowledge resulted in higher score in ECG interpretation (p < 0.001).
Conclusions: The level of knowledge and ability to interpret ECG by students is unsatisfactory and requires firm actions in order to improve learning process.
Key words: ECG, ability to interpret ECG, interpret ECG by students.

Short-term follow-up of the first 30 patients with systolic heart failure treated with angiotensin II receptor blocker neprilysin inhibitor (ARNI)

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Introduction: Optimal heart failure (HF) pharmacotherapy, including new class of angiotensin receptor blocker and neprilysin inhibitor (ARNI), is crucial for the improvement of clinical status, quality of life and prognosis in HF patients with reduced ejection fraction (HFrEF).
Aim of the study: Evaluation of ARNI treatment among HF patients.
Material and methods: Since July 2017 till January 2019 ARNI treatment was initiated with dosage of 24/26 mg twice daily in 30 HFrEF patients with etiology of dilated cardiomyopathy (DCM, n = 18) and ischemic cardiomyopathy (ICM, n = 12), who were in NYHA class I-III.
Results: Out of those there are 28 (93.3%) patients with completed 12months follow-up, whereas remaining 2 (6.7%) patients completed only 6-month follow-up. At the time of the censor date, all patients were alive. At the time of ambulatory visit 25 (83.3%) patients still continued ARNI therapy, whereas 5 (6.7%) stopped. The most common reasons for drug discontinuation were symptomatic hypotonia in 4 (15%) and high cost in 1 (3.3%) patients. The current dosages of ARNI at 12-month visit were as follows: 24/26 mg in 11 (45.8%), 49/51 mg in 11 (45.8%), and maximal dose of 97/103 mg in 2 (8.3%) patients. There was a significant improvement of NYHA class (baseline: 2.7 ± 0.6 vs. 1.95 ± 0.6; p < 0.001) and distance in 6-minute walk test (baseline 386.3 ± 111 vs. 447.8 ± 80 meters, p = 0.025).During the observational period, 3(10%) required urgent hospitalization due HF exacerbation and 4 (13.3%) patients had planned hospitalizations due to ICD/CRT-D implantation.
Conclusions: All patients who started therapy with sacubitril-valsartan were alive after 12 months. Majority of patients continue ARNI therapy; however, discontinuation rate due to side effects, mainly hypotonia and unbearable costs of therapy were relatively high. Functional status of ARNI-treated patients significantly improved during the course of treatment. Only minority of patients achieved maximal ARNI dose, whereas most of patients are treated with minimal or moderate doses. Initial experience with ARNI treatment is good and promising; however, more real-world studies and registries are necessary.
Key words: ARNI, heart failure.

Comparison of clinical and echocardiographic characteristics between patients with amyloid cardiomyopathy and hypertrophic cardiomyopathy

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Introduction: Amyloidosis is a severe, rare disease, in which abnormally folded protein is deposited throughout the body. It leads to serious complications, such as heart failure. However, diagnostic differentiation from hypertrophic cardiomyopathy (HCM) may be challenging.
Aim of the study: The aim of this study was to compare baseline clinical and echocardiographic characteristics of patients diagnosed with amyloid cardiomyopathy (AC) and those with HCM.
Material and methods: We included 15 patients with AC, diagnosed between January 2019 and January 2020, and 21 consecutive HCM patients hospitalized between September and December 2019. We compared clinical, echocardiographic, and laboratory data, including levels of N-terminal pro-brain natriuretic peptide (NT-proBNP), troponin, creatinine, estimated glomerular filtration rate (eGFR), alanine aminotransferase (ALT) and aspartate aminotransferase (AST) measurements.
Results: Overall, AC patients were older (AC: 66.2 ± 11.3 vs. HCM: 57.6 ± 13.1; $p = 0.048$), moreover there was a trend towards more frequent presentation with NYHA III/IV class (AC: 53% vs. HCM: 23%, $p = 0.06$). There were no significant differences between the groups in values of liver and kidney parameters, troponin levels (all $p > 0.05$), however level of NT-proBNP was higher in patients with AC (32280 ± 74811 pg/ml vs. 2898 ± 7209 pg/ml; $p = 0.044$). In echocardiographic evaluation, in patients with AC there was noted similar left ventricle (LV) interventricular wall thickness (AC: 18.2 ± 3 mm vs. HCM: 18.4 ± 4 mm; $p > 0.05$), higher LV posterior wall thickness (AC: 15.6 ± 4.6 mm vs. HCM: 12.8 ± 3.3 mm; $p < 0.05$), and lower LV ejection fraction (AC: 49.4% ± 13.3% vs. 60.2% ± 15%; $p = 0.034$).
Conclusions: Differentiation between HCM and AC is difficult and typically involves complex diagnostic tools. However, baseline profile of AC and HCM patients differs in terms of clinical presentation, LV morphology and function, and NT-proBNP levels.
Key words: hypertrophic cardiomyopathy, amyloid cardiomyopathy.

A neural network model for prediction of adverse events in patients with spontaneous dissection of the brachiocephalic arteries

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Introduction: Spontaneous dissection of brachiocephalic arteries (BCA) is a serious pathology that leads to adverse events of a cerebrovascular nature with neurological deficits. In this regard, the choice of the optimal intervention strategy associated with the lowest risk of possible adverse outcomes is an urgent task of interventional neuroradiology. The use of neural networks capable of analyzing hidden patterns can provide significant assistance in predicting cerebrovascular events in the long-term postoperative period in such patients.
Aim of the study: To develop a mechanism for predicting adverse outcomes using artificial neural networks in patients after endovascular interventions for spontaneous BCA dissection in the long-term postoperative period (6 months).
Material and methods: The neural network was created in the Java NetBeans programming environment. A multi-layer perceptron with 5 input neurons and 2 output neurons was developed. The baseline data were gender, age of the patient, degree of dissection, degree of residual stenosis, and adherence to double antiplatelet therapy (using Morisky-Green-Levine test). 217 patients were selected for the study group, and 57 patients were selected for the cross-validation group.
Results: After the ROC analysis, the area under curve (AUC) of the predictive model was 91.65% when using cross-validation. According to the expert scale of AUC values, this indicator corresponds to a predictive model of excellent quality.
Conclusions: The proposed method for predicting adverse cerebrovascular events in patients with spontaneous BCA dissection based on the mathematical apparatus of artificial neural networks allows obtaining a reliable prognosis in the long-term postoperative period by processing diagnostic information.
Key words: neural network, spontaneous dissection.

Comparision of the frequency of complications depending on radial, femoral and brachial access

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Introduction: The radial approach (RA) is nowadays the most commonly used one and is described as the safest. However, depending on clinical situation, brachial (BA) and femoral approaches (FA) are also used. A failure during the interven-

tion or anatomical variations force the operator to change the access. Thus, it is important to evaluate the rate of complications related to all available access sites.
Aim of the study: To evaluate safety and rate of periprocedural complications associated with RA, FA and BA.
Material and methods: The study group consisted of 120 patients who underwent percutaneous coronary interventions. Patients were collected retrospectively from 2013-2019. Study was provided with ethical principles for clinical research based on the Declaration of Helsinki. Standard descriptive statistics were used in the analysis. The level of statistical significance was set at $p \leq 0.05$. All analyses were carried out with the software StatSoft, Inc. STATISTICA (data analysis software system), version 13.
Results: The average patient's age was 69 ± 10.6 years, most of them were male (63%). The most common reason for the procedure via all approaches was stable angina (RA vs. FA vs. BA: 42.31% vs. 35.71% vs. 37.5%, $p = 0.8$). There were no differences in the amount of radiation dose depending on access, while the highest volume of contrast was given during FA procedures (RA vs. FA vs. BA: 156.6 ± 100.2 vs. 209.2 ± 82.8 vs. 160 ± 52.3 [ml], $p = 0.02$). Initial access site was the most frequently changed in RA group (RA vs. FA vs. BA: 23% vs. 18% vs. 0%, $p = 0.004$). There was no differences in local complications at puncture site between groups ($p = 0.1$) including major bleeding from the puncture site (RA vs. FA vs. BA: 0% vs. 7.48% vs. 2.63%, $p = 0.1$). Furthermore, there was no difference in periprocedural complications, however patients undergoing procedure via FA were associated with higher rate of blood transfusions (RA vs. FA vs. BA: 0% vs. 10.71% vs. 0%, $p = 0.01$).
Conclusions: No differences in local complications after procedure were observed between groups. Femoral access was associated with the highest risk of bleeding requiring blood transfusion.
Key words: radial access, femoral access, brachial access.

Educational needs of patients with coronary artery disease

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Introduction: The education about coronary artery disease (CAD) is the base of the prevention programs that may limit the impact of CAD on patients' health. Understanding of the current educational process might be a key to improving the education itself and consequently the prevention of CAD.
Aim of the study: Our study was designed in an attempt to find patterns characterizing several groups of patients that might be helpful in creating targeted and more efficient education projects.
Material and methods: Data was collected using self designed questionnaire assessing sociodemografic and clinical profile, sources of knowledge and expectations referring to the education about heart diseases. It was conducted among patients at the cardiology department and at the First Cardiological Patients' Congress during New Frontiers in Interventional Cardiology workshop 2018. The results were analyzed comparing the data between several groups of respondents divided according to the sociodemografic and clinical factors.
Results: Of 488 respondents 74% were male, the median age was 68 years (IQR 62-73). History of CAD was reported by 68% of patients. Among all patients the most popular source of knowledge were cardiologist and general practitioner (GP) indicated by 64% and 41% of patients respectively, more often by men than women. Patients with higher education were more likely to use books and Internet sources but they relied less on education provided by cardiologists. The median rate of education provided by physicians was 4 on a 5 degree scale (1 – worst, 5 – best). The source reported as a most valuable was the cardiologist, indicated by 34% of patients. Meetings with health care professionals were indicated as the most preferable form of education regardless of the sociodemografic or clinical factors.
Conclusions: Patients perceive doctors as a most reliable and trusted knowledge source. The role of GPs and the their cooperation with specialists is invaluable in the process of education and prevention. Patients over 65 years old also search for health information, including internet sources, but they prefer forums which is the less reliable sources of knowledge.
Key words: CAD, educational needs of patients.

Acute exacerbation of chronic congestive heart failure and cognitive impairment coexistency in elderly patients- the first echocardiographic measurements analysis

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Introduction: The cardiovascular diseases, particularly heart failure (HF), have been defined as the risk factors of "cardiogenic dementia". Nevertheless, the detailed echocardiographic assessment was not previously performed, either in stable patients with HF or patients hospitalized with the HF exacerbation.
Aim of the study: The aim of this study was to analyze the echocardiographic parameters in patients following HF decompensation with and without screening diagnosis of dementia (SDD).
Material and methods: 139 patients, age 65 or older, who were hospitalized between 2008 to 2017 with the diagnosis of HF decompensation were included. Detailed clinical characteristics with standard laboratory tests and extensive echocardiography parameters analysis were recorded at baseline. The obtained telephone follow up allowed to extract ones with SDD based on ALFI- MMSE with the score of < 17 points.

Results: Patients with SDD were significantly older (median age: 76.5 vs. 70.0 years, $p = 0.013$), with higher presence of renal failure (57.1 vs. 34%, $p = 0.018$) and lower GFR (48.1 vs. 59.9 ml/min/1.73 m^2, $p = 0.021$). In laboratory test results lower haemoglobin level (12.9 vs. 13.6 g/dl, $p = 0.041$) and lower haematocrit (38.1 vs. 40.8%, $p = 0.034$) were detected. Based on echocardiography measurements, higher end-diastolic interventricular septum thickness (12.0 vs. 11.0 mm, $p = 0.021$), higher left ventricular posterior wall thickness (LVPW) (11.0 vs. 10.0 mm, $p = 0.005$), lower left ventricular end-diastolic volume (134.5 vs. 177 ml, $p = 0.031$) and higher maximum aortic gradient (9.0 vs. 7.0 mmHg, $p = 0.013$) were revealed in the group with SDD. By multivariable analysis, the older age ($\beta = -0.19$, $p = 0.003$) and higher LVPW ($\beta = -0.48$, $p = 0.035$) were independently correlated with lower overall ALFI-MMSE score.
Conclusions: In patients following decompensated HF, older age and thicker LVPW independently influenced the occurrence of SDD. Moreover, the significant differences in echocardiographic assessment, associated with cardiac hypertrophy were revealed in SDD patients. To our knowledge this is the first research that provide echocardiographic data in this unique SDD group of patients following HF decompensation.
Key words: dementia, heart failure, exacerbation, echocardiography.

The knowledge about infective endocarditis in Polish cardiological patients

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Introduction: Infective endocarditis (IE) is a serious medical problem concerning mostly patients after cardiosurgical procedures, with artificial valves or congenital heart disorders. However, it is a potentially preventable disease, especially in high risk gropus. Patients' compliance in prophylactics is crucial to achieve better outcomes. Moreover, the level of knowledge about IE was not previously measured in Polish population.
Aim of the study: The aim of the study was to assess the patients' IE literacy.
Material and methods: 58 patients fulfilled a questionnarie concerning its baseline medical characteristics (comorbidites, education, age, place of residence, etc.), knowledge about symptoms and prophylactics of IE. Contributors were divided in two groups – high risk of IE (patients with artificial valves, congenital heart defects and following IE, $n = 27$) and low risk of IE ($n = 31$). The maximum overall score of IE survey was 25 points.
Results: There were no significant differences in terms of gender, age, place of residence, education, comorbidities and prescribed drugs between groups. Furthermore there was no difference in overall IE test result between high risk and low risk participants (3.0 (1.0-11.0) vs. 3.0 (0.0-7.0), $p = 0.69$). Surprisingly, contributors in the high risk group less often take antibiotics than in high low risk group ($p = 0.04$).
Conclusions: The level of IE literacy among the high risk patients is definitely not sufficient. The further campaigns has to increase the level of knowledge to improve patients long-term outcomes.
Key words: infection endocarditis, prevention, propylaxis, survey knowledge.

Does the knowledge of myocardial infarction and stroke symptoms depend on individual cardiovascular risk?

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Introduction: Early recognition of both stroke and myocardial infraction (MI) symptoms plays a key role in long-term prognosis allowing significantly reduced mortality.
Aim of the study: The aim of the study was to compare knowledge of MI and stroke symptoms in patients at high or not-high cardiovascular (CV) risk.
Material and methods: The study covering CV risk assessment and a questionnaire including closed questions about the most common symptoms of MI and stroke was carried out among 387 consecutive patients aged 40 to 70 (mean age 53 ± 8) without cardiovascular diseases attending primary health care in Malopolska. CV risk was calculated using PolSCORE charts as high (≥ 5%) or not-high (< 5%).
Results: Eighty seven patients were at high and 254 at not-high CV risk. Among patients at not-high CV risk the mean awareness of MI symptoms (median 0.5; interquartile range [IQR] = 0.5-0.83) was significantly lower ($p < 0.001$) in comparison to awareness of stroke symptoms (median 0.86; IQR = 0.57-1.0). In this group chest pain was correctly recognized as symptom of MI by 90% of respondents, shortness of breath by 67%, dizziness by 46%, pain radiation to mandible by 39%, arm's pain by 39%. In the same group sudden aphasia/dysarthia was named as stroke symptom by 87%, slurred speech by 88%, balance problems by 77%, hemiplegia by 76%, unilateral decreased sensation by 72%, drooping mouth by 82%, visual field defect by 53%. Similar results were perceived in patients at high risk. The mean knowledge among these patients about MI symptoms (median 0.5; IQR = 0.42-0.75) was lower ($p < 0.001$) compared to stroke (median 0.86; IQR = 0.57-1.0). There were no differences in awareness of MI and stroke symptoms between patients with at high and not-high lower CV risk.
Conclusions: Awareness of the symptoms of life-threating conditions in patient at high or not-high lower CV risk is similar and insufficient, even worse for MI than stroke. There is still a need to educate both high and not-high risk patients.
Key words: myocardial infarction, stroke, symptoms, cardiovascular risk, knowledge, awareness.

Prevalence of anomalies of coronary artery origin in 11,271 patients undergoing coronary angiography – an 8-year single-center experience

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Introduction: Anomalies of coronary artery origin (AoCAOs) are uncommon congenital disorders of the coronary artery anatomy. They are usually accidentally found in coronary angiography (CAG). Their incidence varies between 0.3% and 1.1% (e.g. atypical chest pain).
Aim of the study: To investigate prevalence of AoCAOs in all-comer population of Polish patients undergoing CAG.
Material and methods: We retrospectively investigated medical records of all patients who underwent CAG at our Department from 1 January 2010 to 31 December 2017. Patients with AoCAOs were selected; that is presenting at least one of following features: coronary artery arising outside coronary aortic sinuses, coronary artery arising from the opposite side, absence of left main coronary artery (LMCA), single coronary artery, absence of left anterior descending (LAD) or left circumflex (Cx) artery.
Results: 11,271 patients underwent CAG and 57 (0.506%) of them had 58 AoCAO. The most prevalent anomaly was coronary artery arising from the opposite side (25, 0.222%; 14 Cx from RCA, 2 Cx from right sinus of Valsalva [RSV], 1 LAD from RCA, 3 LMCA from RSV, 2 RCA from left sinus of Valsalva [LSV], 3 RCA from LMCA), followed by coronary artery arising outside of coronary aortic sinuses (15, 0.124%; 14 RCA from the ascending aorta (AoAsc), 1 LMCA from non-coronary sinus (NCS) and LMCA was absent in 14 patients (0.124%). Single coronary artery occurred in 2 patients (0.018%). Left circumflex or left anterior descending artery were absent in 2 patients (0.018%; both absence of Cx). 6 anomalies coexisted with congenital heart disease in 5 patients (8.772%): 2 transposition of great arteries (RCA from LMCA), 2 tetralogy of Fallot (RCA from AoAsc, RCA from LSV, LMCA from NCS) and partial anomalous pulmonary venous connection (RCA from AoAsc).
Conclusions: AoCAOs occur in 0.5% of all-comer population of Polish patients undergoing CAG. Coronary artery arising from the opposite side was the most common anomaly, followed by absence of LMCA and coronary artery arising outside coronary aortic sinuses. There is little overlap with other congenital heart diseases.
Key words: CAG, coronary artery, anomalies, anatomy, epidemiology.

Controversies between medical specialties on the treatment of rare cardiovascular diseases during pregnancy

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Introduction: Management of cardiovascular disease (CVD) during pregnancy is challenging and usually requires eminence-based decisions due to limited strong-evidence data in this field, especially in rare conditions.
Aim of the study: To compare the attitudes of anesthesiologists, cardiologists, and gynecologists towards diagnostics and treatment of potentially life-threatening conditions during pregnancy.
Material and methods: This cross-sectional questionnaire-based study was performed among 111 doctors (55 anesthesiologists, 36 cardiologists, 20 gynecologists), specialists (n = 54) and residents (n = 57). Answers to 19 questions describing personal opinions were recorded using a 5-item Likert scale.
Results: Opinions regarding 8 questionnaire statements differed significantly between specialties ($p < 0.05$). Positive answers for the following questions were the most varied: 1) "women with idiopathic pulmonary arterial hypertension (IPAH) should use effective contraception": 31% of anesthesiologists, 72% of cardiologists, 55% of gynecologists; 2) "thrombolysis should only be used in pulmonary embolism with cardiogenic shock": 53% of anesthesiologists, 81% of cardiologists, 25% of gynecologists. 3) "women with heart failure with reduced ejection fraction should be discouraged from breastfeeding": 2% of anesthesiologists, 28% of cardiologists, 10% of gynecologists. There was one significant difference regarding the following statement: "women with symptomatic valvular disease should be hospitalized in the ICU after delivery, even if no complications occurred" between the opinions of residents: 16% agreed and specialists: 30% agreed ($p = 0.03$).
Conclusions: Diagnostics and treatment of CVD in pregnancy remains controversial. Multidisciplinary approach is recommended to ensure the safety and effectiveness of management in these unique medical conditions.
Key words: pregnancy, cardiovascular disease, pulmonary hypertension, pulmonary embolism, heart failure.

The effect of pharmacotherapy on concentrations of extracellular vesicles concentrations in patients with myocardial infarction

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Introduction: Extracellular vesicles (EVs) are cell-specific nanoparticles released to body fluids, which mediate intercellular communication. The concentrations of EVs change in cardiovascular (CV) disease, such as acute myocardial infarction (AMI), making EVs potential novel biomarkers of AMI. The effect of CV pharmacotherapy on EV concentrations in plasma has not been established yet.

Aim of the study: We aimed to investigate the effect of standard CV pharmacotherapy (antiplatelet therapy, statin and β-blocker therapy) on EV concentrations in plasma in patients after AMI.

Material and methods: Venous blood was collected 24 hours and 6 months after AMI from fasting patients (n = 60, 64.5 ± 10.8 years, 32% female). Flow cytometry (Apogee A60 Micro) was used to determine plasma concentrations of EVs labelled with antibodies for activated platelets (CD61, CD62p; platelet-derived extracellular vesicles (PEVs)), endothelial cells (CD146; endothelium-derived extracellular vesicles (EEVs)) and red blood cells (CD235a; red blood cell derived extracellular vesicles (RBC-EVs)).

Results: After 6 months of treatment, antiplatelet drug ticagrelor decreased the concentrations of PEVs, compared to less potent clopidogrel (p = 0.03), but did not affect EEVs and RBC-EVs. In turn, concentrations of EEVs positively correlated with the dose of atorvastatin (p < 0.001), but this correlation was absent for PEVs and RBC-EVs. The antioxidative β-blocker carvedilol increased concentrations of RBC-EVs, compared to nebivolol (p = 0.05), but did not affect PEVs and EEVs.

Conclusions: During 6 months after AMI, ticagrelor decreased PEV concentrations, atorvastatin increased EEV concentrations and carvedilol increased RBC-EV concentrations, suggesting that the concentrations of EVs are widely affected by CV pharmacotherapy. It is crucial to take into consideration these effects when developing EV-based biomarkers.

Key words: extracellular vesicles, acute myocardial infarction, antiplatelet therapy, cardiology.

Impact of extracorporeal circulation on cognitive functions depending on age in cardiac surgery patients in the perioperative period

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Introduction: Cardiosurgical operations require interference with the functioning of the heart. The use of extracorporeal circulation is associated with impaired blood supply and oxygenation of tissues and organs, especially the sensitive to hypoxia of the brain.

Aim of the study: To determine the depending on age effect of the use of extracorporeal circulation on the cognitive functions of cardiac surgery patients in the perioperative period, whose deterioration may be an early indicator of brain damage, and to examine whether it is a significant factor in cognitive impairment in age groups below 65 and 65 and older.

Material and methods: Prospective, non-randomized, single-center study at the Department of Cardiosurgery of the Medical University of Bialystok, 35 patients (31 men, 4 women) with extracorporeal circulation applied. Including 19 patients under 65 (17 men, 2 women) and 16 patients aged 65 and older (14 men, 2 women). The Montreal Cognitive Assesment Test (Polish adaptation) was used for evaluation in patients before and after cardiac surgery. The studies were conducted from October 2019 to January 2020.

Results: The mean MoCA test score in patients under 65 years of age (p = 0.6) and 65 years and older (p = 0.13) did not change significantly. Changes in patients under 65 years of age: no statistically significant changes in MoCA test except improvement of the delayed recall by 0.89 points (p < 0.05). Changes in patients aged 65 years and older: deterioration of the visuospatial/executive by 0.94 points (p < 0.05), the cuboid drawing test by 0.38 points (p < 0.05), the clock drawing test by 0.5 point (p < 0.05), deterioration of the subtraction by 0.25 point (p < 0.05), improvement of the delayed recall by 0.8 point (p < 0.05).

Conclusions: Cardiac surgery may be an important risk factor for cognitive impairment in the perioperative period associated with brain hypoxia during surgery. The use of extracorporeal circulation may be a stronger risk factor for cognitive impairment and may be associated with greater deterioration of cognitive function in patients in the perioperative period of 65 years and older than in patients under 65 years of age. Improvement of the delayed recall in both groups may be associated with learning.

Key words: cognitive functions, extracorporeal circulation, cardiosurgery, age.

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

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Introduction: Endovascular aortic repair (EVAR) is a modern treatment option in both elective and emergency aortic aneurysm. The presence of the graft may be associated with increased risk of thrombosis, whereas double antiplatelet therapy (aspirin and clopidogrel) after EVAR may increase the risk of bleeding.
Aim of the study: To assess the effect of branched EVAR on platelet reactivity in patients with thoraco-abdominal aortic aneurysm.
Material and methods: The study population comprised of 25 patients undergoing elective or emergency branched EVAR (Zenith t-Branch®) of thoraco-abdominal aortic aneurysm (mean age 68.9 ± 4.4 years, 64% male). Patients who required oral anticoagulation, with end-stage renal disease or severe liver dysfunction were excluded from the study. Blood samples were collected 3 times: before the operation, within 24 hours after the operation and at hospital discharge. Platelet reactivity was assessed using impedance aggregometry (Multiplate® Analyzer) with arachidonic acid (ASPI test), adenosine diphosphate (ADP test) and thrombin receptor activating peptide (TRAP test) as agonists. Clinical data regarding thrombotic and bleeding events were extracted from the hospital database.
Results: There was a stepwise decrease in platelet reactivity after the operation, compared to baseline ($p < 0.0001$) in response to all agonists, with the lowest platelet reactivity at discharge. There were no thrombotic events until discharge. After the operation, 11 patients required red blood cell (RBC) concentrate transfusion. At admission, there was a negative correlation between platelets reactivity and post-operative decrease in haemoglobin ($r < –0.15$, $p < 0.51$ for all), and the amount of RBC units transfused after the operation ($r < –0.5$, $p < 0.02$ for all). No other platelet-related parameters correlated with a number of RBC units transfused.
Conclusions: Platelet reactivity decreases after branched EVAR of thoraco-abdominal aortic aneurysm. Lower platelet reactivity at admission is associated with higher amount of RBC units transfused after the operation. Platelet reactivity is a promising biomarker to predict post-operative bleeding after the surgery.
Key words: aortic aneurysm, EVAR, platelet reactivity, bleeding.

mRNA transcripts expression to predict cardiac remodelling after myocardial infarction

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Introduction: Adverse myocardial remodelling is defined as an increase in end-diastolic left-ventricular volume by 20% 6 months after myocardial infarction (MI). Cardiac remodelling is associated with ventricular dysfunction and malignant arrhythmias, therefore deteriorating the prognosis. At present, there are no reliable molecules to predict cardiac remodelling.
Aim of the study: To compare the concentrations of mRNA transcripts in the peripheral blood of patients after MI with and without cardiac remodelling, and analyse the correlations between mRNA transcripts in the acute phase of AMI and echocardiographic features of remodelling.
Material and methods: The study included 74 patients with first ST-elevation myocardial infarction (STEMI) treated with percutaneous coronary intervention. Whole blood concentrations of 6 transcripts (RNASE1, JDP2, CD163, CYP27A, versican [VCAN], IL1R2) were determined 24 hours after AMI using droplet digital polymerase chain reaction. The correlations between transcripts expression 24 hours after AMI and left ventricular ejection fraction (EF), concentration of N-terminal-pro B type natriuretic peptide (NT-proBNP), delta EF and delta NT-proBNP at 6 months were evaluated.
Results: Among 71 patients, 29 patients did, and 12 patients did not develop cardiac remodelling at 6 months. VCAN expression level 24 hours after AMI was lower in patients who developed remodeling, compared to those who did not ($p = 0.04$, Fig. 1), and discriminated between these two group of patients (area under the ROC curve 72%, $p = 0.04$, Fig. 2). There was a positive correlation between VCAN and NT-proBNP at 6 months ($r = 0.27$, $p = 0.06$, Fig. 3). In addition, there was a positive correlation between CD163 and delta NT-proBNP ($r = 0.27$, $p = 0.03$, Fig. 4).
Conclusions: Dysregulation of VCAN and CD163 expression in the acute phase of AMI may contribute to cardiac remodeling at 6 months. VCAN is a protective proteoglycan regulating cell survival and extracellular matrix assembly, whereas CD163 is involved in wound healing after AMI. Whether decreased expression of VCAN might be a useful tool to predict cardiac remodeling in clinical practice remains to be established.
Key words: cardiac remodelling, mRNA transcripts.

Angina with unobstructed coronary arteries – lipid parameters analysis

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Introduction: Even up to 30% of patients reporting angina, who undergo coronary angiography, are characterised with no haemodynamically significant atheromatous plaques. Although visible unobstructed coronary flow in arteries in standard coronary angiography, these patients are at higher risk of major adverse cardiovascular events (MACE) as well as they may suffer from procedure's complications.
Aim of the study: The aim of the study was to investigate lipid parameters' alterations associated with angina in no haemodynamically significant lesions in coronary angiography.
Material and methods: Consecutive 131 patients without haemodynamically significant lesions in planned coronary angiography and 123 control subjects with narrowed lumen of at least one coronary artery were included to the study. All participants (mean age 66 ± 11.26) reported chest pain and had lipid parameters measured, including low- and high-density lipoprotein cholesterol (LDL-C and HDL-C), total cholesterol (TC) and triglycerides (TG). Non-HDL-C concentration was calculated as the difference: TC – HDL-C.
Results: Blood concentrations of TC (4.72 ± 1.41 mmol/l vs. 4.34 ± 1.26 mmol/l; $p = 0.026$), LDL-C (2.70 ± 1.25 mmol/l vs. 2.25 ± 1.01 mmol/l; $p = 0.003$), non-HDL-C (3.24 ± 1.36 mmol/l vs. 2.90 ± 1.15 mmol/l; $p = 0.045$) as well as LDL-C/HDL-C ratio (2.01 ± 1.30 vs. 1.63 ± 0.74; $p = 0.018$) were significantly elevated in patients without haemodynamically significant lesions in coronary angiography compared to the controls. Univariate logistic regression analysis revealed that TC, LDL-C, non-HDL-C and LDL-C/HDL-C ratio are valuable predictors of unobstructed coronary arteries, while every multivariate logistic regression model determined female sex and arterial hypertension as the independent risk and protective factor, respectively.
Conclusions: Increased TC, LDL-C, non-HDL and LDL-C/HDL-C ratio are lipid risk factors associated with no haemodynamically significant lesions in coronary angiography in patients reporting angina.
Key words: angina pectoris, coronary angiography, coronary artery disease, lipids.

Prostanoids impair platelet reactivity, platelet EV release and thrombus formation in patients with pulmonary arterial hypertension

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Introduction: Prostanoids (epoprostenol, treprostinil and iloprost) induce vasodilation in advanced pulmonary arterial hypertension (PAH) but also inhibit platelets, increasing patients' bleeding risk. Therefore, platelet function was measured in PAH patients treated with prostanoids and treated with endothelin receptor antagonists (ERA) or phosphodiesterase 5 inhibitors (PDE5i).
Aim of the study: Comparison of prostanoid-induced platelet inhibiting effect in patients with PAH and patients treated with endothelin receptor antagonists (ERA) or phosphodiesterase 5 inhibitors (PDE5i).
Material and methods: Venous blood was collected from 42 patients treated with prostanoids (study group; $n = 42$, 49 ± 16 years, 64% female) and 38 patients treated with ERA or PDE5i (control group; $n = 38$, 56 ± 16 years, 68% female). Platelet reactivity was analysed in whole blood by impedance aggregometry using arachidonic acid (AA; 0.5 mM), adenosine diphosphate (ADP; 6.5 µM) and thrombin receptor-activating peptide (TRAP; 32 µM) as agonists. In a subset of patients, concentrations of extracellular vesicles from platelets (CD61+ and CD62p+; PEVs), leukocytes (CD45+, LEVs) and endothelial cells (CD146+, EEVs) were analysed in platelet-depleted plasma using flow cytometry (A-60 Micro). Platelet-rich thrombus formation was measured using whole blood perfusion system (T-TAS plus).
Results: Patients treated with prostanoids had lower platelet reactivity in response to AA and ADP ($p = 0.01$) and lower concentrations of PEVs and LEVs ($p \leq 0.05$), compared to control patients. Furthermore, thrombus formation was delayed ($p \leq 0.003$) and thrombus size was decreased ($p = 0.008$) on prostanoids. Epoprostenol did not affect platelet reactivity *in vitro*, but decreased the concentrations of CD61+ PEVs ($p = 0.04$). In contrast, treprostinil and iloprost decreased both platelet reactivity in response to AA and ADP ($p \leq 0.05$) and the concentrations of PEVs ($p \leq 0.08$). All prostanoids delayed thrombus formation and decreased thrombus size ($p \leq 0.04$).
Conclusions: Patients with PAH treated with prostanoids have increased risk of bleeding both due to impaired platelet function and thrombus formation, compared to patients treated with ERA or PDE5i. Treprostinil and iloprost seem to affect platelet function more than epoprostenol.
Key words: pulomonary arterial hypertension, platelets, extracellular vesicles, prostanoids.

The weather conditions analyzed with the artificial intelligence system may be used as predictor of the prevalence of acute coronary syndromes

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Introduction: It was shown that various individual weather conditions are associated with the incidence of acute coronary syndromes (ACS). Despite this, the prediction of the number of ACS depending on the weather conditions in the given place and time is not effective to date.
Aim of the study: We sought to investigate whether the artificial intelligence system might be useful in prediction of the prevalence of ACS based on weather conditions.
Material and methods: Data of 105 902 consecutive patients obtained from National Health Service registry, hospitalized due to ACS in Lesser Poland Province between 2008 and 2018 have been compared with meteorological conditions collected in the Institute of Meteorology and Water Management from two weather stations. Analysed weather conditions included following atmospheric conditions: air temperature (T, °C), dew point temperature (T_dp, °C), air pressure (Pres, hPa), relative humidity (Hum_2, %), wind speed (W_10, ms^{-1}) and precipitation (Prec, mm) as measured in accordance with World Meteorological Organisation. For all variables measured values were analysed with a special focus of the extremes as well as their short-term fluctuations, including 3-hour, 6-hour, daily ranges and day-to-day variability and processed in a system based on machine learning (Random Forest). It allowed to create a predictive model of ACS incidence and determined importance of each inputted weather parameter in this prediction.
Results: For two meteorological stations the correlation between real number of ACS and predicted number of ACS for four seasons is as follows: for spring it ranges from 0.69 to 0.71 with confidence intervals (CI) of 0.63-0.77, for summer: 0.66-0.75 with CI of 0.59-79, for autumn: 0.69-0.74 with CI of 0.63-0.79 and for winter: 0.69-0.72 with CI 0.63-0.77 ($p < 0.0001$ for each prediction). The most important parameters were differences between maximal and minimal Hum_2, maximal and minimal T_dp during one day and maximal Hum_2.
Conclusions: Artificial intelligence system seems to be useful in predicting the prevalence of ACSs with model based on weather conditions.
Key words: weather, acute coronary syndromes, artificial intelligence.

Quality of life in patients hospitalised with heart failure and parameters with an influence on it

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Introduction: In heart failure(HF) patients are exposed on severe symptoms of the disease, fatal prognosis, rehospitalizations and higher risk of depression. There is documented that their quality of life is decreased. Furthermore, it was observed that more patients with HF would rather live better than longer. Quality of life (QoL) assessment in HF is important but usually neglected in Polish healthcare.
Aim of the study: Our aim was to determine, if patients' quality of life QoL, simply measured by WHOQOL-BREF questionnaire, correlates with any of patients' health status or different parameters.
Material and methods: 111 patients hospitalised with HF were interviewed with WHOQOL-BREF form which is tool assessing patient QoL. We collected clinical and biochemical parameters. We divided them into three subgroups, according to their score in somatic domain of WHOQOL-BREF – the first group represented the best QoL with transformed score above 55 points (results can vary 0-100), the second group involved patients with average QoL-45-55 points and the third group with the lowest outcome – below 45 – the worst QoL. In order to determine evident differences between parameters in patients with the best and the worst QoL, we analysed biochemical and clinical parameters groups 1 and 3. Patients with severe infections were excluded from the study.
Results: Patients with the highest somatic domain score, had significantly higher BMI (29.8 ± 5.5 vs. 26.8 ± 5.7 kg/m^2, $p = 0.016$), lower BNP level, an important heart failure marker (465 vs. 967 pg/ml, $p = 0.005$), higher LVEF (30.7 ± 12.0 vs. 23.9 ± 10.8%, $p = 0.006$), higher triglycerides level (2.02 ± 1.22 vs. 1.43 ± 0.76 mmol/l, $p = 0.027$), higher iron level ($p = 0.019$) and transferrin saturation ($p = 0.015$). Also higher NYHA class was associated with better QoL ($p = 0.034$), as well as lower geriatric nutritional risk index (GNRI) score ($p = 0.01$). There were no differences between patients' age, gender, HF etiology and other echocardiographic and biochemical parameters.
Conclusions: The somatic domain in patients diagnosed with HF is strictly correlated with patients' health status – expressed as the stage of the disease – represented by NYHA class and BNP level, as well as the nutritional status – BMI, triglycerides level and GNRI marker. On the contrary, QoL status was not associated with age and gender which are depicted in the literature as the important aspects influencing QoL of the community. QoL assessment and monitoring might be especially beneficial in patients with heart failure and it should be performed along with appetite and nutritional status estimation.
Key words: quality of life, heart failure, nutrition, health status.

Case reports

Junctional rhythm as a manifestation of myocardial infarction

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Introduction: The electrocardiogram is one of the fastest and most important tests in the diagnosis of myocardial infarction. Beyond the typical changes of the ST segment, T or Q waves abnormalities, or a new bundle branch block, myocardial ischemia can cause less specific abnormalities in the ECG.
Case report: 78-year-old non-smoking woman without a significant history of chronic disease apart from eye cataract surgery was admitted to the local hospital with chest pain and nausea. At admission, type 2 diabetes was diagnosed, and the ECG revealed atrial fibrillation. During further observation, the previously reported pain subsided, and repeated ECG showed a junctional rhythm with a frequency of 45 bpm. Blood tests revealed significant cardiac biomarkers elevation consistent with myocardial ischemia. The patient was referred to the Institute of Cardiology in Warsaw for further treatment in the Intensive Cardiological Care Department. Upon admission, the patient reported nausea and dyspnea without chest discomfort. In ECG monitoring a junctional rhythm with a frequency of about 50 bpm and episodes of atrial fibrillation was observed. In transthoracic echocardiography hypokinesis of the basal segments of the lower, posterior and lateral wall was found, without global left ventricular ejection fraction alteration – LVEF 65%. Blood tests confirmed further elevation of cardiac biomarkers: TnT 1897 ng/l, CK-MB mass 254.3 IU/l, and NT-proBNP 3702 pg/ml. Coronary artery angiography showed an occlusion of the initial segment of the left circumflex artery. The artery was revascularized with a good angiographic result. Due to narrow vessel size stent implantation was abandoned. Medical treatment with UFH, ticagrelol and atropine was administered. After a successful intervention, a conversion of junctional rhythm to sinus rhythm was observed, without further signs of arrhythmia. Hospitalization proceeded without complications and on the 5th day the patient was discharged from hospital in good condition.
Conclusions: Myocardial infarction does not always manifest with typical ECG changes. In this case, the manifestation of ischemia was a complete atrioventricular block with substitute junctional rhythm. Although, the ECG is one of the crucial parts of myocardial infarction diagnosis, the physical examination, echocardiography, blood tests and patient's history remain the complementary part of diagnosis.
Key words: junctional rhythm, myocardial infarction, acute coronary syndrome, ECG, electrocardiogram, angioplasty.

Challenges faced when treating heart failure with a severely reduced ejection fraction in a young patient using a left ventricular assist device

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Introduction: Left ventricular assist device implantation (LVAD) in heart failure (HF) patients is associated with complications. Thromboembolic events such as ischemic strokes are dreaded as they hold a high mortality rate. Despite carefully monitored antithrombotic treatment, the risk of patients having a stroke with an LVAD is thought to be approximately 2 to 6 times higher than that of a patient with HF and no LVAD. This is due to pump thrombosis.
Case report: A 36 year old male was admitted to hospital with symptoms of left HF for a one and a half months. Upon admitting the patient, his ejection fraction was 15% and he was in a state of cardiogenic shock. The HF symptoms were preceded by flu like symptoms. The diagnosis of HF secondary to viral myocarditis was made. The exact causal virus is unknown. Tests for Epstein-Barr Virus, Influenza groups A, A(H1N1) and B and Cytomegalovirus were negative. Initially, the patient was treated using intravenous infusions of inotropes and an intra aortic balloon pump but failed to achieve a satisfactory left ventricular function. 2 days later, the patient received a LVAD(Levitronix). There were no surgical complications. The patient was started on warfarin on day 8 post-op and his International Normalized Ratio ranged between 3.209 and 1.730. Fraxiparine was added. During this period, the patient was doing well. He ambulated around the ward under the care of a physiotherapist. He was prescribed an array of medication to fight the HF. Echocardiography showed evidence of improving left ventricular function. On day 26 post-op, the patient experienced an ischemic stroke, most probably due to pump thrombosis. He had worsening aphasia, right sided weakness, and a drooping right mouth corner. The patient underwent a thrombectomy of the left Middle Cerebral Artery (MCA). After the procedure the patient was able to communicate well and displayed symmetrical limb strength. The patient has been discharged and is awaiting a heart transplant.
Conclusions: This case highlights the importance of improving antithrombotic therapy and investigating novel methods in predicting and preventing thromboembolic complications in LVAD patients in order to prevent catastrophic outcomes.
Key words: heart failure, LVAD, complications, thromboembolic, stroke, viral cardiomyopathy.

Hemoptysis as a first sign of cardiac tumour

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Introduction: Primary heart tumors are being discovered in 0.001-0.3% of autopsies which makes them an exceptionally rare pathology. The majority of them are benign with myxomas being the most frequent type. Only 25% of them are malignant lesions with angiosarcoma being the most frequent subtype in general.

Case report: This case study investigates a 19 year old male patient admitted to the hospital with a two month history of hemoptysis. CT scan on admission excluded pulmonary embolism but revealed disseminated, possibly metastatic densifications in the lungs along with a tumour in the right heart. MRI discovered a large mass in the right atrium and ventricle with a small amount of fluid in the pericardial cavity. Echocardiography confirmed a 70 × 45 mm lesion in the right heart chambers infiltrating the free wall of the right atrium and tricuspid valve. The patient was transferred to the cardiac surgical ward, but the possibility of operative treatment was precluded due to the anatomical location of the tumor. Biopsy of the lesion advised during an oncological consultation was postponed due to the patient's lack of agreement for prolonged hospitalization. The patient was readmitted to the cardiology department two weeks later with severe dyspnoea, weakness and hemoptysis. Despite being a high-risk procedure, biopsy of the tumor was performed. The results showed poorly differentiated angiosarcoma cells classified as G3. The patient was transferred in very serious condition to the oncology department for an attempt at systemic treatment. Unfortunately, his condition during transport got worse with severe dyspnoea and cyanosis. He was admitted directly to the ICU with a suspicion of pulmonary embolism; mechanical ventilation was immediately implemented with no overall improvement. After 2 days the patient died.

Conclusions: Angiosarcoma is an aggressive malignant tumor which spreads through blood vessels, creating metastases mainly in the lungs, central nervous system and bones, but also may lead to pulmonary embolism. Nevertheless, in cases of hemoptysis even patients with high risk of thromboembolism cannot receive anticoagulant treatment. Survival rate fluctuates with a median survival ranging from 6-11 months. The oncological treatment is based on absolutely crucial histopathological results which may be very challenging to obtain due to tumor location and necessity of a high-risk myocardial biopsy. Early diagnosis remains a fundamental issue as symptoms tend to be nonspecific and often associated with other diseases. Prognosis remains poor.

Key words: angiosarcoma, hemoptysis, dyspnoea, heart tumour, biopsy.

Dentistry, Maxillofacial Surgery and Otolaryngology

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List of papers:

Translation efforts and cultural adaptation of the smartphone application BruxApp into Norwegian

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Introduction: Awake bruxism (AB) is a masticatory muscle activity during wakefulness that is characterized by repetitive or sustained tooth contact and/or by bracing or thrusting of the mandible and is not a movement disorder in otherwise healthy individuals. The diagnosis of awake bruxism is based on the patient's self assessment, clinical examination, electromyographic (EMG) record, and now, Ecological Momentary Assessment (EMA). Due to the fact that to record the muscle activity with EMG during the day actually it is not applicable in real life, nowadays EMA is more widely used to diagnose day bruxism. The BruxApp introduced the EMA principles in the field of AB by the use of smartphone technology (BruxApp, BruxApp Team, Pontedera, Italy). The application has been formally translated into more than 20 languages, and a standardized procedure for translations.
Aim of the study: To describe the process of translating the smartphone application BruxApp into Norwegian.
Material and methods: The English version of BruxApp is adopted as a template for the multi-language translation, according to a step-by-step procedure led by mother-tongue experts in the field. The original text was translated independently by two bilingual forward translators, and the native language of each was Norwegian. The next step was to translate strings, which means sequences of alphanumeric texts in computer programming. These translations were done on a special platform POEditor.
Results: As a result of all these actions, there are two versions of BruxApp available: BruxApp Research and BruxApp.
Conclusions: BruxApp makes it possible to manage the data for both clinical and research analyses. Using officially translated and culturally adapted version of the BruxApp provides opportunities to collect a great deal of data, which makes it possible to carry out research into the epidemiology of different types of bruxism, both at the individual and global levels.
Key words: awake bruxism, bruxism, translation, ecological momentary assessment, smartphone.

Self-perceived dentists' knowledge of temporomandibular disorders

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Introduction: The most common non-dental orofacial pain conditions are temporomandibular disorders (TMDs). TMDs basic examination and clinical management are included in all Polish dentistry school educational programme but it is not clear how dentists cope with diagnosis and possible treatment in routine dental practice.
Aim of the study: The aim of the present study was to assess the level of dentists' self-perceived knowledge of TMD.
Material and methods: The volunteers were Polish dentists from randomly selected dental offices in Cracow, who had studied and graduated in Poland. The participants were administered an anonymous questionnaire, which contained questions regarding the self-assessment of the knowledge of TMD diagnosis and therapy and assessment of the knowledge of etiology and TMD symptoms.
Results: Only 6.5% of the participants assessed their TMD knowledge as very good. 32.3% assessed it as good, 39.3% thought it was sufficient, 20.4% as insufficient and 1.49% considered it poor. 9.5% of all the participants said they had attempted to diagnose and treat TMD patients – very often, 26.4% chose – often, 45.7% selected – rarely, and 18.4% admitted they had never made such an attempt. There was significant relationship between the dentists' knowledge and their attempts at diagnosing and treating TMD patients ($p < 0.05$).
Conclusions: Polish dentists' knowledge of TMD is still insufficient. Raising the level of knowledge would considerably help dentists to refer their patients to the right specialist for a diagnosis and TMD treatment.
Key words: TMD, stomatognathic system, knowledge, dentist.

The incidence and risk factors of tooth loss in an adult population: a retrospective radiographic analysis

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Introduction: Tooth loss is increasingly becoming a significant public health problem. As the population is becoming older, a proper dental care is necessary to preserve natural dentition. Thus, outlining the causes of tooth loss may improve the management of oral health.
Aim of the study: The purpose of this retrospective radiographic analysis was to evaluate the incidence and identify the risk factors for tooth loss in the adult patient population.
Material and methods: The study protocol was approved by the Bioethical Committee of the Jagiellonian University. A population of patients subjected to panoramic radiography twice between 2001 and 2019 was preselected from the archives of the Dental University Clinic in Cracow. Out of the preselected group of patients, those who had radiographs taken with a minimum of a 4-year interval and were at least 18 years old when the first radiograph was done, were enrolled to the study. Based on the comparison of the radiographic images performed for each patient, the number of lost teeth was calculated. The status of each lost tooth was recorded based on the criteria regarding caries lesions, root canal treatment, periapical

status, type of the restoration and periodontal interproximal bone loss.
Results: The study population consisted of 182 patients. The total baseline number of teeth was 4472. Within the study period, 337 teeth in 128 patients were lost. Among the lost teeth, 201 were molars and 136 were non-molar teeth. The major cause of tooth loss was carious destruction.
Conclusions: Extensive caries was associated with tooth loss over time among the examined patients. There was a higher risk of molar than non-molar loss. Early caries detection and treatment may reduce the number of lost teeth. Hence, effective dental care is necessary to retain natural dentition as major causes of tooth loss are highly preventable.
Key words: caries, panoramic X-rays, radiography, risk factors, tooth loss.

The association between oral malodour and tongue coating – a clinical and autofluorescent evaluation

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Introduction: Halitosis is a significant multifactorial oral health issue affecting gravely the patient's quality of life. It is caused most commonly by volatile sulphur compounds (VSCs) excreted by several bacterial species colonising the dorsal surface of the tongue. These bacteria also contain endogenous porphyrins in their cell wall, which are responsible for emitting a detectable red-orange glow under blue light from autofluorescence examining devices.
Aim of the study: The aim of the present study was to identify a possible association between tongue coating and oral malodour.
Material and methods: Systemically healthy and non-smoking volunteers reporting a complaint of oral malodour and/or tongue coating were enrolled in the study. Patients were asked to withold from food consumption and brushing teeth for 12 hours prior to the examination. Tongue coating was assessed in the conventional oral examination using Winkel's tongue coating index (WTCI) and by autofluorescent imaging (VELscope device). Oral malodour was also evaluated by means of the two following methods: Rosenberg's organoleptic score (OLS) and gas chromatography (OralChroma) identyfying the following VSCs in the exhaled air: hydrogen sulfide, methanethiol and dimethyl sulfide. Patients were lastly asked to denote the level of self-experienced halitosis on a visual analogue scale.
Results: The severity of oral halitosis exhibits a tendency to correlate with both the clinically observed amount of tongue coating as well as the appearance of the tongue under autofluorescent imaging. Most patients' self-assessment of their halitosis was more negative and severe than the one performed by the examiner.
Conclusions: All described methods of halitosis evaluation could be used collectively to allow a more detailed assesment of severity of the oral malodour during the initial diagnosis as well as provide a comprehensive method of monitoring the effects of its' treatement.
Key words: oral malodour, halitosis, tongue coating, autofluorescence.

Periodonal health and oral health care among adults in Vilnius, Lithuania

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Introduction: Periodontal disease is characterized by the destruction of hard and soft connective tissue constituents of the periodontium. The most recent data of the prevalence of periodontal diseases among adults in Lithuania has been recorded in 1997/1998. Oral health surveys are needed to determine predominance of oral conditions, the nature and urgency of oral health interventions.
Aim of the study: To assess the oral health status of adults from Vilnius, compare the patients' self-evaluations of oral hygiene, oral health and stress with the results of the clinical examination expressed using gingival bleeding index and periodontal status (CPI).
Material and methods: A total of 452 adults (M_{age} = 52.7, SD = 13.3) participated in this study. Prior to the initial dental visit, a questionnaire measuring self-rated oral health, hygiene and stress was administered. Gingival bleeding index and CPI were assessed during intraoral examination. All procedures were approved by License of Bioethics Committee of Lithuania, No 158200-17-920-426. Data analysis was done using descriptive statistics, independent sample *t*-test, Mann-Whitney, One-way Anova, Kruskal Wallis tests. Significance level $p < 0.05$.
Results: The mean percentage of dentition with pockets was 35.7%, for the 4-5 mm pockets 44.8% and for advanced ones 5.3%. The average number of teeth with any attachment loss was 4.1 teeth. Self-reported information about dental and gum health was significantly related to CPI and stress levels ($p < 0.001$). Patients with worse oral hygiene had significantly higher levels of gingival bleeding and CPI.
Conclusions: Periodontal health in Vilnius is suboptimal, requiring intervention. The presence of oral conditions is influenced by oral hygiene and levels of stress.
Key words: oral health, CPI index, gingival bleeding.

Therapeutic options of chronic nonallergic rhinitis treatment, application of nasal cytology in study group selection

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Introduction: Chronic nonallergic rhinitis and sinusitis (CNRS) are significant medical bothers for over 10% Europeans. In rhinological practice over 40% of rhinitis have nonallergic origin. Despite the serious prevalence of this medical disorders, the treatment options are very poor.
Aim of the study: The aim of this study was to prepare the methods of group selection and assessment of treatment effects of CRNS in subterraneotherapy conditions.
Material and methods: 8 patients (7 women and a man) at the age of 34-71 years with the diagnosis of CNRS took part in the study. In all patients the survey about medical condition, nasal cytology and the self-assessment using VAS scale were conducted. After 3-weeks of subterraneotherapy rehabilitation the cytology and VAS scale were collected again.
Results: The nasal cytology showed 3% eosinophils in only one patient, while among the others, the eosinophiles number was 0%. After treatment the nasal cytology has improved in 1 patient. However, the comparison of VAS scale revealed significant improvement in general symptoms intensification (6.2 vs. 1.5 cm) and nasal congestion (5.2 vs. 1.2 cm) after subterraneotherapy.
Conclusions: The most effective tool to measure the treatment effects is VAS scale. The subterraneotherapy rehabilitation decreases the CNRS symptoms measured in VAS scale.
Key words: subterraneotherapy, chronic nonallergic rhinitis and sinusitis, VAS scale, nasal cytology.

The analysis of the influence of different types of titanium plates on the increased rate of postoperative complications among the patients with mandibular fractures

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Introduction: The Department of Cranio Maxillofacial Surgery of MUW stated the increased rate of complications after surgery among the patients with mandibular fractures in the last 2 years. Except for the producer of titanium plates nothing has changed in the procedure over last few years.
Aim of the study: Aim of the study was to check the amount of complications over the past 5 years and to check if there is an increased rate of complications as well as to find a correlation between the different types of titanium plates and increased amount of complications while excluding all the other factors.
Material and methods: We designed a retrospective study in which 722 patients from years: 2015-2019 years were included, each of them underwent a rigid mandibular fixation surgery of fractures. Data collected from case records included: age, time from injury to surgery, type and amount of plates, screws and openings used, type and amount of mandibular fractures and information about postoperative complications. This data were statistically analysed. Complications were divided into: severe (non-union, mobility of bone fragments at the anastomosis site) and moderate (swelling, fistula, changes in occlusal conditions, pain and limited mandibular abduction), in some cases reoperation was necessary. The composition and shape of the titanium plates were studied.
Results: Among all the patients 85 (11.77%) presented complications. It was noticed that 12 from 20 (60%) of patients with severe complications were treated with Modus plates in comparison with other plates (p = 0.0012). Reoperation was necessary for 6 of 7 (85.7%) patients with complications among Modus group (p = 0.001). Analysis also showed a correlation between fracture site and complication: mandibular body – severe complications, mandibular branch – swelling, condylar process – occlusal changes. Statistical analysis didn't show the correlation between complication frequency and other parameters. Titanium plates have differences in shape and composition.
Conclusions: Frequency of severe complications and amount of reoperations increased over the past 2 years and it is correlated with the use of Modus titanium plates. The cause of this may be the shape and the composition of plates.
Key words: mandibular fractures, titanium plates, postoperative complications.

The attitude of Polish dentists towards children treatment

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Introduction: The dentists' attitude towards Children Treatment is one of the factors affecting the success of pediatric dental treatment.
Aim of the study: The aim of the study was to present the attitude of dentists towards Children Treatment.
Material and methods: A questionnaire survey was conducted among 736 dentists and consisted of 46 questions about premedication, adaptive and prophylactic visits, methods of treatment, attitude and impact on the child's behavior in the office, used behavioral methods, approaches to non-cooperating patients. Data were analyzed using descriptive statistics and the Spearman test ($p > |0.015|$).
Results: For the analysis 577 surveys were qualified. The average age was 33 (± 31.8) years. Premedication was used

by 16.7%. Disabled patients were treated by 60.5% of respondents. Only 17.8% used caries risk assessment questionnaires. Independent adaptation visits were conducted by 70.5%. Almost all performed prophylaxis, more often including treatment (59.5%). Glass-ionomer cement was most frequently used for restoration of primary teeth. Primary teeth were treated endodontically by 41.3% and young permanent teeth by 65.4%. As many as 72.3% of dentists made their attitude to a patient dependent on the style of parents' upbringing and chose on this basis methods of shaping the dental approach. About 65% of dentists used behavioral methods. Non-cooperating children were treated by 16.7%. To immobilize the child, 4.5% of dentists asked for dental assistance, and 35.6% for the parents' help. According to 84.9%, it was possible to overcome dentophobia through adaptation visits.

Conclusions: Most of the dentists treat children, including the youngest and disabled children, and proceed with prophylactic treatments. A premedication is used by a minority. Glass ionomer cement is the most popular material for reconstruction. Every second doctor immobilizes a child asking parents for help. It is possible to overcome dentophobia through adaptation visits.

Key words: pediatric dentistry, behavior management, dentist attitude, child's dental treatment, dental fear.

Oral health status in disabled and healthy children subjected to teeth extractions under general anesthesia

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Introduction: According to literature, oral health status is poor in many children, especially in disabled ones. Teeth extractions carried out beyond the age of natural teeth loss may lead to malocclusion and temporomandibular dysfunction.

Aim of the study: The purpose of this retrospective study was to determine and compare the oral health status, indications for treatment and number of extracted teeth in disabled and healthy children subjected to teeth extractions under general anesthesia (DGA).

Material and methods: Data of disabled children (group A) and healthy children as controls (group B), undergoing teeth extractions under DGA in the Department of Oral Surgery at Medical College of the Jagiellonian University in Cracow between May 2015 and December 2019 were recorded, including: age during surgery, oral health status before treatment using dmft/DMFT index (decayed, missing and filled teeth), number of extracted teeth and indications for treatment in 3 age groups: 2-6, 6-12 and 12-18 years.

Results: Data of 323 disabled children (35.3%, mean age 8.20 ± 3.69 years) and 592 healthy controls (64.7%, mean age 5.32 ± 2.71) were analysed. In group A most patients were aged between 6 and 12 (49.54%) and in group B between 2 and 6 (69.76%). The dmft indexes were 6.42 ± 5.23 (A) and 8.06 ± 4.74 (B), and DMFT indexes were 2.58 ± 4.57 (A) and 0.58 ± 1.76 (B). The highest DMFT index was in disabled children aged between 12 and 18 (9.67%). The mean number of extracted primary and permanent teeth in group A was: 3.2 ± 3.3 and 0.48 ± 1.15 while in group B 4.18 ± 3.09 and 0.14 ± 0.6, respectively. In the disabled patients caries, pulp disease and periapical periodontitis accounted for 38.55%, 27.98% and 21.39%, while in the controls – 36.53%, 37.19%, 20.48%, respectively. Caries dominated in all age groups, except for controls between the age of 2 and 6, who mainly suffered from pulp disease (40.73%).

Conclusions: In our study there was no significant difference between oral status in disabled and healthy children. In both groups the dmft indexes in 2-6-years-old children were high thus to minimise the potential risk of surgeries under DGA, one should reinforce dental prevention already in early childhood.

Key words: disability, extractions, children, dental general anesthesia.

The concentration of fluoride in the saliva after application of fluoride gel using toothbrush in young adults

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Introduction: Fluoride is the foundation of preventive dentistry. Manufacturers of fluoride gels recommend mouth rinsing after gel application which reduces the concentration of fluoride in saliva.

Aim of the study: The aim of the study was to examine to what extent mouth rinsing affects the retention of fluoride ions in saliva as compared to no rinsing after brushing teeth with fluoride gel.

Material and methods: The study included 103 dental students aged 21-25, consisted of a survey and a clinical and laboratory examination of saliva. A single-blind, randomized, crossover design was used. The application of fluoridated gel was performed in the morning, 2 hours after breakfast. After supervised toothbrushing for 2 min with Elmex Geele (Colgate Palmolive, dose 1 cm) participants in Group A (n = 52) were asked to expectorate all excess product for 30sec and in Group B (n = 51) to rinse their mouths with 50 ml of tap water. Saliva (5 ml) was taken into tubes 15 min after gel brushing. Fluoride determination was carried out with ion suppression ion chromatography.

Results: Each participant used toothpaste with fluoride daily, mostly 1450 ppmF. Mean values of fluorine ion concentration before brushing: group A 0.19 ± 0.38, group B 0.08 ± 0.10, p = 0.044; after brushing: group A 15.33 ± 14.73, group B 6.19 ± 5.97, p = 0.001. Average post-pre-emptive differences and p-value for comparison of groups A and B

(based on t-test): group A 15.5 ± 14.74, group B 6.11 ± 6.00, $p = 0.000$. The correlations between the fluorine concentration in saliva and the daily use of fluorine pastes and between the consumption of food products with high fluorine content were proved to be statistically insignificant.
Conclusions: A higher concentration of fluoride in saliva occurs after fluoridation without rinsing the mouth after Fluoride gel brushing. Discontinuation of oral rinsing after the use of fluoride preparations results in a higher concentration of fluoride in saliva, which makes these preparations more effective. Demonstrating this dependence may be a basis for changing the manufacturers' recommendations on how to use gels and will require further research.
Key words: fluoride, fluoride gels, caries prevention, fluorosis.

Oral cavity reconstruction with pedicled, local flaps

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Introduction: Facial artery musculomucosal flap (FAMM) and deep lingual artery propeller flap (DLAP) are methods of reconstruction medium size defects in the oral cavity. They provide both functional and aesthetic results and can be alternatives to the microsurgical and traditional methods of reconstruction.
Aim of the study: The aim of this study was to assess final results of oral cavity defects reconstruction with FAMM and DLAP flaps among patients operated in the Department of Cranio-Maxillofacial Surgery in Cracow.
Material and methods: 4 patients with FAMM and 4 patients with DLAP flaps operated in 2019 were recalled. Facial appearance, tongue mobility, oral mucosa appearance, swallowing, secretion of saliva, maximal interincisal opening, exteroreceptive sensation, lips mobility and patients' satisfaction were evaluated.
Results: All reconstructions with DLAP were successful. Total necrosis of one FAMM flap was observed. In positively ended cases all patients were satisfied with the results of treatment and all evaluated parameters were satisfying.
Conclusions: FAMM and DLAP flaps are an effective method of reconstruction soft tissue defects in the oral cavity.
Key words: FAMM flap, deep lingual artery propeller flap, oral cavity reconstruction, oral squamous cell carcinoma.

The analysis of measurements of different anthropological distances on the face and oral cavity in young Polish adults – retrospective study

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Introduction: To rebuild a perfect smile a valid measurements are needed. Because in different populations the dimensions of the intra and extraoral structures may differ, it is essential to determine the appropriate norms in Polish population so that they can help in teeth restoration which would be both physiological and morphological.
Aim of the study: Evaluation of the relationship between different anthropological distances on the face and dimensions of the teeth in Polish young adults.
Material and methods: The study was performed on the data including diagnostic models, cephalometric X-rays and extraoral photographs collected in 2011-2013 (study no. NN403589138 – the group of 260 young adults, volunteers form Poland, 17-19 y.o., both sexes). The group of 22 people with Angle's I class was randomly selected. 4 of them were excluded due to lack of full documentation. Each measurement was taken by 3 different people. To analyse the diagnostic models, analogue calipers were used. The analysis of cephalometric X-rays and extraoral photographs using Adobe Photoshop® was performed. The maxillary anterior teeth width (CW), the occlusal incisors height (OIH) and the intercanine distance (TTD) were measured with two methods. The face heights, the interalar distance (IAD) of relaxed and smiled face were measured using Adobe Photoshop®.
Results: The golden proportion, generally accepted as 1.618 : 1 (Upper Central Incisor Width : Upper Lateral Incisor Width), was evaluated as 1.3 : 1. The average Shimbashi number/OIH in young polish population is significantly lower than in the original study (Shimbashi, 1970s') and it is 14.1 mm (compared to 19 mm ± 1 mm). The IAD value was found to be different than TTD.
Conclusions: Based on these results, the use of these measurements in dental practice in restoring teeth is not reliable in Polish population.
Key words: anthropometric measurements, occlusion, teeth width, analysis.

Gene or protein? Searching a good prognostic marker in laryngeal lesions based on cyclin D1

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Introduction: Abnormal regulation of the cell cycle can lead to neoplasia. About 90% of malignant tumors in larynx arise from the premalignant lesions. Cyclin D1 regulates G1-S phase transition and its overexpression is linked to the development and progression in various types of cancers.
Aim of the study: In our study we examined whether cyclin D1 protein expression and G870A polymorphic variants of CCND1 can be useful in predicting the susceptibility and outcome in precancerous laryngeal lesions (PLL) and laryngeal cancer (LC).
Material and methods: 435 patients were enrolled, including 101 LC, 100 PLL and 234 healthy controls. We examined expression of cyclin D1 by immunohistochemistry and polymorphism by RLFP. Study group was kept under surveillance for over 15 years.
Results: Levels of cyclin D1 protein differed significantly between PLL and LC (median 10 (5-15) and 20 (10-35) respectively; $p < 0.0001$). In PLL with progression, initial concentrations of cyclin D1 were lower than in the cancer tissue during the follow-up period (median 5 (1-10) and 26 (10-40) respectively, $p = 0.002$). Gradually increasing expression of cyclin D1 from low-grade dysplasia (median 10%), through high-grade dysplasia (15%) to carcinoma (30%; $p = 0.01$) was revealed. Presence of A allele was significantly higher in the study group compared to healthy controls and increased genetic predisposition to LC about 3 times in univariate and multivariate analysis. Significant association between A allele presence and increased risk of PLL progression to cancer (OR 1.72; 95% CI: 1.07-2.77) and development of cancer from healthy mucosa (OR 2.55; 98% CI: 1.33-4.9; $p = 0.006$) was detected. CCND1 AA and AG genotypes were more common in patients with poorly differentiated tumors ($p = 0.04$). In univariate and multivariate analysis high expression of cyclin D1 was an independent factor affecting the reduction of survival in LC. Moreover, every 1% rise of expression resulted in 3% higher risk of death from cancer (HR 1.02; 95% CI: 1.004-1.05; $p = 0.01$).
Conclusions: Our results show that the expression of cyclin D1 is important in progression of premalignant lesions to laryngeal cancer and the common polymorphic variant in the gene may be in fact a risk factor for LC.
Key words: premalignant laryngeal lesions (PLL), laryngeal cancer (LC), cyclin D1 protein, prognostic factor, marker, biomarker.

Correlation between exacerbation of chronic rhinosinusitis and intensity of symptoms reported by patients

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Introduction: Chronic rhinosinusitis (CRS) is a condition where symptoms of sinusitis are present longer than 12 weeks and there are at least two symptoms like nasal blockage/obstruction/congestion, nasal discharge, facial pain/pressure and reduction or loss of smell. There can be some seasonal exacerbations in the course of the disease.
Aim of the study: The aim of the study was to analyse the prevalence and intensity of symptoms in patients with exacerbated CRS and baseline CRS.
Material and methods: To accomplish the study a group of 100 patients with a primary diagnose of CRS, treated in the Department of Otorhinolaryngology JUMC, was selected. 50 among these patients suffered from acute exacerbation of CRS. Each patient was asked to fill in a questionnaire concerning their health and to evaluate the prevalence and intensity of typical CRS symptoms in a Visual Analogue Scale. Collected data was analysed in relation to the exacerbation of the disease.
Results: Both, patients with baseline CRS and patients with exacerbated CRS reported ailments like headache and facial pain or pressure rarely. Even if they reported these symptoms, they assessed them as less severe than others. In both groups, patients reported a presence of nasal discharge the most often and the most severe symptom was a loss of smell. Groups varied between each other in the assessment of a few symptoms. Patients with exacerbated CRS complained about post-nasal drip and headache much more often, while baseline CRS patients suffered from nasal congestion and forehead pain or pressure a little bit more frequently. It should be emphasized that although patients with exacerbated CRS claimed more often their symptoms in last two weeks to be not severe at all, they were the group that assessed other symptoms as the most burdensome more frequently.
Conclusions: Even though symptoms of CRS are present regardless of the exacerbation of the disease, there are some ailments, like post-nasal drip or headache, which are more representative for patients with CRS.
Key words: chronic rhinosinusitis, exacerbation, clinical symptoms, VAS.

Clinical oral manifestations in the course of graft-versus-host disease after allogeneic hematopoietic stem cell transplantation

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Introduction: Patients who undergo successful allogeneic hematopoietic stem cell transplantation (HSCT) are exposed to numerous post-transplantation complications. The most severe is graft-versus-host disease (GVHD), which is diagnosed, according to various authors, in between 30-80% of cases. The oral cavity is frequently involved, as the second most common site involved after skin due to HSCT, having a strong impact on quality of life of patients.
Aim of the study: The aim of the study is to present intraoral manifestations of GVHD divided into two categories: acute and chronic, considering their frequency and exact localization.
Material and methods: Literature from the PubMed base and the Google Scholar base from 1984 till 2020 was analyzed. Twenty-nine items were obtained; after verification, 22 articles were included that described 36 patients.
Results: The most common oral manifestations of acute GVHD are white changes that constitute 29% of changes. Patients with chronic GVHD express red changes most often that constitute 36% of changes. In both acute and chronic GVHD intraoral manifestations, the most frequently affected area is oral mucosa. Xerostomia is a problem of 56% of analyzed patients.
Conclusions: The patient with oral manifestations of GVHD should be under adequate medical supervision. The drugs of choice for the treatment of GVHD are corticosteroids, selective immunosuppressants, calcineurin inhibitors, other immunosuppressants and anti-infectives. Extracorporeal photopheresis and phototherapy constitute second-line treatment.
Key words: oral graft-versus-host disease, allogeneic hematopoietic stem cell transplantation, oral manifestation, GVHD.

Evaluation of acute visual assessment documentation of periorbital trauma patients: accident and emergency doctors versus oral maxillofacial surgeons

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Introduction: All staff are expected to perform a competent basic eye examination and risk assessment on acutely injured periorbital trauma patients as 30% of patients will develop devastating ocular injuries if missed.
Aim of the study: The aim of the present study is to evaluate the competency level of clinicians in performing basic eye examinations in periorbital trauma patients.
Material and methods: Case notes of periorbital trauma patients were compared to guidelines to assess documentation of eye examination. This involved documentation by Accident and Emergency (A&E) doctors and Oral Maxillofacial Surgery (OMFS) doctors over 8 months. Data collected was categorised as: compliant, partially-compliant or non-compliant.
Results: Documentation by A&E doctors (n = 38) and OMFS doctors (n = 29) were described as percentage frequencies (%). Acute visual assessment documentation showed (OMFS, 62%; A&E, 10.5%) were compliant, (OMFS, 17.3%; A&E, 23.7%) partially-compliant and (OMFS, 20.7%; A&E, 65.8%) non-compliant. Areas which were lacking in performance and documentation showed 39.5% ocular movements, 15.8% visual acuity, 7.9% visual fields, 44.7% risk assessment of surface injury to the globe and 15.8% referral to ophthalmology when indicated by A&E doctors whilst 41.38% visual fields and 31.03% referral to ophthalmology when indicated by OMFS doctors.
Conclusions: The retrospective audit showed A&E and OMFS doctors eye examinations are poor and did not reflect current guidelines, suggesting a need for improvement in visual assessment documentation in both departments.
Key words: visual assessment, periorbital trauma, clinical audit, evaluation, guidelines, documentation.

Psychiatry, Neurology, Neurosurgery and Case Report

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Case reports

The effect of verbal abuse on the mental health of children

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Introduction: In recent years, the issue of mental health has become a global concern due to the rise in mental illnesses. And it is widely known that childhood experiences play a vital role in the life of any human. Hence, it has become important to determine the effect of certain actions carried out on a child. One of these actions is verbal abuse which is popular (especially in Africa) in the process of child training. Therefore, this research is aimed at evaluating the consequences of verbal abuse on their mental health.
Aim of the study: To help curb the increase in mental illnesses.
Material and methods: A study was carried out between November and December, 2019 on 360 randomly selected school children through informal interviews and questionnaires, in Uyo, Nigeria. 30% were aged 3-6, 40%, 7-10 and the other 30% were aged 11-14.
Results: It was seen that among the 360 children, 70% have been verbally abused. 10% of this percentage being age 3-6, 30%, aged 7-10 and 30%, aged 11-14. 90% of the verbally abused children were found to have low self-esteem as well as tendencies to be depressed as a result of the abuse.
Conclusions: The state of the mind is a major factor in determining well-being and since childhood experiences often last a lifetime, it is vital to ensure that certain methods used in the process of child training are stopped. This will go a long way to ensure the birth of a mentally healthy generation. Therefore, going by the research results, it is clear that verbal abuse is dangerous to the mental health of the child and thus, should be stopped.
Key words: verbal abuse, effect, mental health, children.

Prevalence of symptoms of skin, digestive tract and musculoskeletal system among patients of psychotherapy station

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Introduction: Prevalence of the psychosomatic disorders is increasing; however, patients in the primary-care unit usually undergo only somatic diagnostics and treatment keeping the main psychological cause unclear.
Aim of the study: This research is focused on finding the prevalence of physical symptoms among patients who have recently started psychotherapy treatment because of their mental health issues.
Material and methods: 70 patients and 79 people of the control group were interviewed. The questionnaire of 26 questions about symptoms of skin, digestive tract, musculoskeletal system and dermatology life quality index (DLQI) questionnaire were used. Statistical analysis was performed using SPSS 23.0. Significance level – $p < 0.05$.
Results: 31 (44.3%) men and 39 (55.7%) women of the patient group (average age 31.46 ± 9.5) and 21 (26.6%) men and 58 (73.4%) women of the control group (average age 30.3 ± 12.2) have conducted the questionnaire. During the last 12 months at least one time per week significantly higher number of people in the patient group than people in control experienced nausea; painful swallowing; bitter taste; burning sensation behind the chest; joint pain; itching of the skin; numb feeling in limbs and back, neck pain; diarrhea ($p < 0.05$). During the last 12 months significantly higher number of people in the patient group than in control group were constantly experiencing tension in back/limbs; feeling of bloating; stomach pain; changed shape of nails; hair loss; skin rashes; acne ($p < 0.05$). DLQI score above 6 points reached 16% of patients and 2% of control group.
Conclusions: In the group of patients with mental health issues physical symptoms were expressed significantly more often than in control group. Physical symptoms have strong correlation with mental health. Therefore, special attention to the psychological issues should be paid while diagnosing patients in primary-care unit.
Key words: psychosomatic symptoms, DLQI, mental health.

Importance of vestibular schwannoma size as a prognostic factor for surgical outcomes

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Introduction: Vestibular schwannoma (VS) is a benign tumour of the vestibulocochlear nerve. Its unique localisation at the cerebellopontine angle increases its clinical importance. Upon growing, it has a potential to compress the brainstem and cranial nerves, most frequently affecting the facial nerve. VS growth is usually slow, thus creating debates on when to apply a watchful waiting strategy and when to operate. To address this question, there is a need to find reliable predictive factors for surgical outcomes.
Aim of the study: To evaluate pre-operative MRI images and correlate the size of VS with the surgical outcome.
Material and methods: We conducted a retrospective study involving 31 patient diagnosed with a VS and operated between 2009 and 2019 in Vilnius University Hospital Santaros Klinikos and the Republican Vilnius University Hospital. In all considered surgeries the same approach was used and all procedures were performed by the same surgeon. MRI T1+ contrast scans were analyzed using ImageJ software. We evaluated 6 intracranial and 2 intrameatal measurements from the axial plane, 2 intracranial measurements from the sagittal plane and 4 intracranial measurements from the coronal plane. 3 of these were area measurements and the remaining 11 were diameter measurements. Surgical outcomes were correlated by a post-operative House-Brackmann scale grade evaluating facial nerve function. Grades I-III were considered a good outcome.

Results: All cases were divided into groups of intrameatal and cisternal tumours. In the group of cisternal tumours, worse outcomes were associated ($p < 0.05$) with smaller absolute, cisternal and anterioposterior diameters in the axial plane and the absolute diameter in the sagittal plane. After withdrawing cases with noted facial nerve deficit pre-surgically, it was noticed that worse outcomes are associated with a rostral growth and better outcomes are positively correlated with a posterior growth. After evaluating the importance of measurements within solid versus cystic tumour groups, diameters that were associated with worse outcomes in the solid tumour group were greater absolute diameter ($p = 0.083$) and area ($p = 0.069$) in the sagittal plane and absolute diameter (p = 0.053) and cranial growth diameter (p<0,05) in the coronal plane.
Conclusions: Size does not appear to be a direct prognostic factor for a surgical VS removal surgery. Measurements that correlated with worse surgical outcomes in a group of asymptomatic cisternal VSs were greater absolute diameters in the sagittal and coronal plane, area in the sagittal plane and the cranial diameter in the coronal plane.
Key words: vestibular schwannoma, acoustic neuroma, acoustic neurinoma.

Impact of vestibular schwannoma shape on surgical outcomes

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Introduction: Vestibular schwannoma (VS) is a benign tumour of the vestibulocochlear nerve. Its unique localisation at the cerebellopontine angle increases its clinical importance. Upon growing, it has a potential to compress the brainstem and cranial nerves, most frequently affecting the facial nerve. VS growth is usually slow, thus creating debates on when to apply a watchful waiting strategy and when to operate. Several studies were previously conducted predicting that round-shaped tumours have a better surgical outcome. However, there is no established opinion on this question.
Aim of the study: To evaluate pre-operative MRI images and correlate the shape of a VS with its removal outcomes.
Material and methods: We conducted a retrospective study involving 31 patient diagnosed with a VS and operated between 2009 and 2019 in Vilnius University Hospital Santaros Klinikos and the Republican Vilnius University Hospital. In all considered surgeries the same approach was used and all procedures were performed by the same surgeon. Only cisternal tumours with an intact facial nerve function before a surgery were taken for the analysis ($N = 18$). MRI T1+ contrast scans were analyzed using ImageJ software. In the axial plane, two measurements were used to determine the shape of a tumor: the mediolateral diameter (ML) and the anterioposterior diameter (AP). Tumours were considered round when their ML/AP ratio was in a range of [0.7-1.3]. All other homogenous tumours were considered oval. Cystic VSs were analyzed as a separate shape. Surgical outcomes were correlated by a post-operative House-Brackmann scale grade evaluating facial nerve function. Grades I-II were considered a good outcome.
Results: All oval tumours had a post-surgical House-Brackmann scale grade I-II. 50% of all round tumours had a good surgical outcome. Only 20% of operated cystic tumours were evaluated as having a good surgical outcome. Overall, a tumour shape significantly correlated with surgical outcomes ($p < 0.05$).
Conclusions: According to the study, vestibular schwannoma shape has a significant predictive value for a surgical outcome. Previously reported hypothesis that round shaped tumours have better surgical outcomes seems to be inaccurate as in our study, oval shaped tumours had the best surgical outcomes. It is reported that cystic vestibular schwannomas has a worse prognosis and our results are consistent with this view. However, some inconsistencies should be taken into account such as an absolute tumour size and tumour growth into different directions. Thus, further studies are needed.
Key words: vestibular schwannoma, acoustic neurinoma, acoustic neuroma.

The delay in diagnosing secondary progressive multiple sclerosis course in multiple sclerosis patients in Riga East University Hospital

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Introduction: Multiple sclerosis (MS) is the most common demyelinating disease with autoimmune substance in genetically susceptible individuals with higher incidence between young people. There are following disease's phenotypes: relapsing-remitting multiple sclerosis (RRMS), primary progressive multiple sclerosis (PPMS), secondary progressive multiple sclerosis (SPMS), clinically isolated syndrome (CIS). MS is incurable, leaves significant neurological deffects and reduces quality of life. For estimation patients' disability and disease modifying treatment (DMT) selection Expanded Disability Status Scale (EDSS) is used. There is no available test to confirm SPMS, minimal EDSS = 4 is needed to establish diagnosis. Criteria to determine the transition from RRMS to SPMS are challenging and are often made retrospectively.
Aim of the study: To analyse EDSS levels in each MS phenotype and treatment group. To define MS patients' group with possible SPMS course.
Material and methods: Cross sectional study based on medical histories of MS patients in Riga East University hospital. To process data of MS patients in IBM SPSS 23.0 and Microsoft Excel 2016 using nonparametric tests.
Results: 161 patients from Riga East University Hospital were included in research with MS diagnosis: women 94 (58.4%), men 67 (41.6%) at average age 41 ± 11.67 ($p < 0.005$). In RRMS group 81.9%, SPMS 9.4%, PPMS 3.8% and 4.4% patients with CIS were perfomed. Median EDSS level in RRMS group was 2 (IQR 1.5-3); SPMS – 6 (IQR 4.5-6.5); PPMS – 5 (IQR 2.5-6.5) and CIS – 1 (IQR 1-1.5), ($p < 0.001$). Among

RRMS patients 16.4% appeared with EDSS > 4; SPMS – 93.3%; PPMS – 66.7%; all patients with CIS had EDSS < 4, (p < 0.001). Several DMT were used among all patients, but no significant differences in EDSS levels were detected.
Conclusions: In RRMS group 16.4% of patients with high disability under potential risk to turn into SPMS course were presented. The highest EDSS level was shown among SPMS patients. Clinical isolated syndrome is rarely presented with disability. No significant differences in EDSS levels in DMT groups were detected due to small patient amount.
Key words: demyelinating disease, multiple sclerosis, Expanded Disability Status Scale.

Assessment of the quality of life of carers of people suffering from Huntington's disease

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Introduction: Huntington's disease (HD) is a rare neurodegenerative disease inherited in an autosomal dominant manner. Trajectory of illness in a family with HD can last for several dozen years. Complexity of problems resulting from the hereditary nature of HD have a huge impact on the quality of life of family caregivers, who are aware of the progression of the disease in subsequent generations. Carers have been described as "forgotten people" in HD families, forgotten also in genetic counseling.
Aim of the study: The aim of this study is to assess the quality of life of caregivers of people suffering from HD.
Material and methods: 55 people were invited to the survey, of which 51 completed the questionnaire. The research tool was a questionnaire, evaluating three aspects of quality of life: practical aspects of care, satisfaction with life, emotions in the life of a carer related to HD (HDQoL-C) and EQ-5D scale.
Results: The majority(68.6%) of carers are women, married(60%), with higher education (47.1%). The average age is 51.8 years (SD = 15.7). 64.7% are the main caregiver of the patient, and the average duration of care is 8 years. Among 61% of carers, care over the patient has a significant impact on their quality of life. Over half (51%) are moderately satisfied with life. For 76% of carers, how they feel is having a moderate impact on their quality of life. Main carers have significantly decreased quality of life. All three aspects of the QoL correlate positively with Visual Analogue Scale (EQ-5D component).
Conclusions: Long-term care for patients with HD has a significant impact on the quality of life of family caregivers. In the health care system, attention should also be paid to carers who, due to the deterioration of health resulting from care, will be potential patient of healthcare services.
Key words: Huntington disease, quality of life.

The quality of patient online educational resources regarding neurological and psychiatric conditions: The Good, the Bad and the Ugly

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Introduction: The Internet is an influential and popular source of information for patients with mental and neurological conditions.
Aim of the study: The study aimed to assess the quality of information about six neurological and psychiatric conditions found on English language websites addressing the general population.
Material and methods: The cross-sectional observational study included 150 websites presenting information about Alzheimer's disease, Parkinson's disease, anxiety, autism, depression, and schizophrenia. For each condition, the first 25 websites meeting the inclusion criteria were selected from the search engine's results page. A literature-based content quality benchmark including symptoms and treatment sections was developed for each condition and revised by two neurologists or psychiatrists. Each website was rated for completeness and accuracy by two independent evaluators using a common set of instructions. Inter-rater reliability was checked using Cohen's κ test and a consensus assessment was conducted for websites with a κ < 0.8. Overall and conditions specific quality scores were reported on a 5-point scale. Scores above 4 were considered good. Condition-specific mean scores were compared using one-way ANOVA test after checking data normality using the Kolmogorov-Smirnov test. The threshold for statistical significance was set at 0.05.
Results: The overall mean completeness and accuracy scores were 2.7 and 3.4 respectively. Condition-specific mean completeness and accuracy scores had the following values respectively: Alzheimer's disease 2.6 and 2.6; Parkinson's disease 2.7 and 3.7; anxiety 1.8 and 3.6; autism 3.5 and 3.5; depression 2.5 and 3.9; schizophrenia 3.3 and 3.0. Statistically significant differences were observed between condition-specific scores regarding completeness (ANOVA F = 9.034; p < 0.001) and accuracy (ANOVA F = 14.122; p < 0.001). The percentage of websites with both completeness and accuracy scores in the range of 4 to 5 was 4.7%.
Conclusions: Overall, the quality of the English language websites about neurological and psychiatric conditions was modest and only a few websites had good completeness and accuracy scores.
Key words: consumer-health informatics, completeness, accuracy, health-related information, patient educational resources.

Depression, anxiety and stress manifestations in people suffering internet addiction

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Introduction: Today, the issue of Internet addiction is gaining more urgency. Although the study of Internet addiction, with its social, educational, and physical impact, has attracted widespread scientific attention, psychological changes such as depression, anxiety, and stress occurring in the background of this addiction are under-researched.
Aim of the study: To investigate the impact of Internet addiction on the expressiveness of depression, anxiety and stress.
Material and methods: We interviewed 362 people, aged 16 to 32. 87 men (24.03%), 275 women (75.96%). To conduct research and optimize our results we used: 1) Kimberly Young Internet Addiction Questionnaire (IAT); 2) Depression, Anxiety and Stress Scale (DASS 21); 3) Mathematical statistics methods.
Results: After interviewing the surveyed persons, we found out that 1.93% of the interviewed spend less than 1 hour in the network, 1-3 hours – 31.77%, 3-5 hours – 42.27%, more than 5 hours – 24.03%. Interviewees were divided into two groups according to their Internet addiction: 66 people (18.23%) who had Internet addiction – "A" group and 296 people (81.77%) without this addiction – "B" group. According to the results of the investigation and statistics analysis, the following regularities were found: the expressiveness of depression in group "A" was moderate (45.45%) or severe (33.33%), in group "B" – mild (50.67%) or moderate (32.43%). The level of anxiety in group A was moderate (75.76%), in group B it was normal (58.10%) or mild (17.90%). The level of stress in group A was severe (46.96%) or moderate (30.30%), in group B moderate (47.97%) or normal (45.94%). According to the survey, 63.3% of the surveyed people turn their phones off just before bedtime, and 36.7% half an hour before bedtime. The use of gadgets right before bedtime has been shown to cause insomnia and increase the chance of stress developing and depressive syndrome by 12-28%, due to the negative effects of cold blue light produced by LCDs.
Conclusions: Therefore, Internet addiction has a direct impact on the development of depression, anxiety and stress. People with Internet addiction is observed a greater severity of mental illness that needs psychotherapeutic correction.
Key words: Internet, addiction, depression, anxiety, stress.

Neurosurgical treatment of interdigital (Morton's) neuroma with radiofrequency ablation

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Introduction: Morton's neuroma is a very common cause of metatarsalgia. Conservative treatment has a temporary positive effect. Surgical treatment (removal and neurolysis) of Morton's neuroma has disadvantages such as long-term restriction of the load on the foot, the formation of a terminal neuroma and neuropathic pain syndrome. The use of minimally invasive techniques will avoid these disadvantages.
Aim of the study: The purpose of this study was to investigate the effectiveness of radiofrequency ablation (RFA) in patients with chronic pain refractory to conservative therapy.
Material and methods: 88 patients were studied. There were 6.8% of men and 93.2% of women among them. The median age was 45 years (from 20 to 68 years). All patients have previous conservative treatment. Continuous RFA was performed under ultrasound guidance and electrophysiological control by using one or more of 90 seconds cycle and with maintenance of the probe tip a temperature of 90°C. We followed patients for a 11.1 ± 2.2 months to assess their change in visual analogue pain scores (VAS), symptom improvement, complications. The obtained results were processed using Statistica 10.0. (StatSoft inc.). Nonparametric statistical methods were used (Mann-Whitney *U*-test).
Results: Mean VAS score before the procedure was 8.4 ± 1.5. A reduction of pain intensity was achieved in 1 day after RFA (mean VAS scores 2.3 ± 1.4), with stabilization of painful symptomatology during the following months. In 12 months after RFA mean VAS core was 1.9 ± 0.9 ($p < 0.001$). No patients developed complications. Overall, 93.2% of patients were either very or moderately satisfied with their outcome. 5 of 6 patients with recurrence of symptoms were undergone RFA again successfully.
Conclusions: Radiofrequency ablation is a safe and effective, minimally invasive technique for the treatment of Morton's neuroma.
Key words: metatarsalgia, Morton's neuroma, radiofrequency ablation.

Influence of embolization on tortuosity of cerebral arteries: a retrospective case-control study

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Introduction: Arterial tortuosity is a phenomenon that affects hemodynamics of blood flow. It is influenced by patients age, atherosclerosis, arterial wall damage, collagen defects and deficiencies. However, impact of surgical procedures of aneurysms on arterial tortuosity is unknown.
Aim of the study: In our study we decided to determine, whether tortuosity of internal carotid artery (ICA) is affected by performing coiling of cerebral aneurysm.

Material and methods: We retrospectively analyzed 52 patients with single intracranial aneurysm, treated with endovascular procedure. Based on their Digital Subtraction Angiography images, obtained prior to the procedure and after first follow-up examination (avg. 15 months), we analyzed tortuosity of ICA, both on the side of embolization and on the other side. Following tortuosity descriptors were calculated: relative length (RL), sum of angle metrics (SOAM), triangular index (TI), product of angle distance (PAD), and inflection count metric (ICM). To represent changes in tortuosity, for each descriptor we defined Δ as value of the descriptor prior to embolization – value of the descriptor on follow-up examination.
Results: In the follow up the tortuosity of ICA changed on both coiled and not coiled side. Mean ΔRL was smaller on coiled side (–0.02 ± 0.03 vs. –0.01 ± 0.03; $p = 0.002$) in comparison to the other side. ΔPAD (1.06 ± 0.98 vs. 0.54 ± 0.92; $p = 0.007$) and ΔICM (2.41 ± 2.18 vs. 1.1 ± 1.85; $p = 0.001$) were bigger on the embolized side. Furthermore, male patients had higher ΔTI (–0.04 ± 0.12 vs. 0 ± 0.07; $p = 0.018$) of both ICA, in comparison to female ones. Additionally, patients taking angiotensin-converting-enzyme inhibitors (ACEI) had smaller ΔSOAM (–0.12 ± 0.17 vs. 0.58 ± 0.59; $p = 0.011$) and ΔPAD (0.12 ± 0.25 vs. 1.16 ± 0.98; $p = 0.023$). We also observed that there is a negative correlation between age and ΔTI ($R = –0.23$; $p = 0.018$). Logistic regression analysis showed that embolization independently influenced the increase of ΔICM (OR 1.29, 95% CI: 1.04-1.65; $p = 0.027$) and reduction of ΔRL (OR 0.18, 95% CI: 0.03-0.92; $p = 0.046$).
Conclusions: In our study we observed that coiling procedure performed on cerebral aneurysms as well as patients' age, sex and ACEI intake may increase the tortuosity of ICA.
Key words: aneurysm, embolization, tortuosity.

Intracerebral haemorrhage – computational analysis of perihemorrhagic area

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Introduction: Computational analysis of intracerebral haemorrhage (ICH) was showed to be useful in determining treatment outcome and risk of its expansion. However, most analysis is applied to hematoma mass, neglecting its surroundings.
Aim of the study: To determine whether quantitative analysis of perihemorrhagic density can be associated with outcome and ICH expansion.
Material and methods: We retrospectively analysed 60 patients with spontaneous supratentorial ICH. For each patient we obtained their head CT and transformed image to obtain exact contour of ICH. Then, we extracted circular area around contour, with circle centre in its centroid and perimeter equal to distance between two furthest point on contour. For such area, we calculated four moments of a distribution: standard deviation (SD), coefficient of variance (CoV, variance/mean), skewness (S, third moment) and kurtosis (K, fourth moment). Upon admission patients were assessed using Glasgow Coma Scale (GCS) and upon discharge using Glasgow Outcome Scale (GOS). ICH expansion was defined as any increase in ICH volume on control CT. Poor outcome was defined as GOS < 3.
Results: A total of 34 (56.67%) patients had poor treatment outcome and 15 (25%) had ICH expansion. We found that patients with poor outcome had lower GCS upon admission (4.97 ± 3.24 vs. 10.84 ± 4.52; $p < 0.01$) and were older (69.18 ± 12.56 vs. 55.58 ± 17.91; $p < 0.01$). They also had higher SD (32.18 ± 9.70 vs. 27 ± 9.04; $p = 0.039$), CoV (8.43 ± 4.62 vs. 5.36 ± 3.16; $p < 0.01$) and S (0.16 ± 0.84 vs. –0.25 ± 0.67; $p = 0.045$). Moreover patients with ICH expansion had higher SD (34.87 ± 11.37 vs. 28.29 ± 8.59; $p = 0.021$) and CoV (9.6 ± 5.6 vs. 6.27 ± 3.46; $p < 0.01$) and lower K (–0.61 ± 0.72 vs. –0.07 ± 0.86; $p = 0.034$). In multivariate logistic regression analysis, after adjustment for all possible confounders higher CoV (OR: 1.711; 95% CI: 1.113-3.289; $p = 0.048$) and age (OR: 1.103; 95% CI: 1.024-1.229; $p = 0.03$) and lower GCS (OR: 0.691; 95% CI: 0.513-0.852; $p < 0.01$) remained associated with higher risk of poor treatment outcome. Lower K (OR: 0.382; 95% CI: 0.132-0.879; $p = 0.042$) was associated with higher risk of ICH expansion.
Conclusions: Computational analysis of perihemorrhagic density can be useful in determining outcome and risk of ICH expansion.
Key words: computational analysis, intracerebral haemorrhage, ICH, perohemorrhagic area.

Cerebral aneurysm rupture during clipping – retrospective assessment of its predictors

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Introduction: Intraoperative cerebral aneurysm rupture (IOR) is a common phenomenon with frequency of around 19%. This has been profoundly studied for coiling procedures, but there is less research on operative cerebral aneurysm treatment and its complications.
Aim of the study: Our study's main point is to assess possible predictors of IOR.
Material and methods: We retrospectively study examined all saccular aneurysms surgically treated from 2013 to 2019. Study group consisted of 198 patients. Operative reports, patient histories, blood test results, discharge summaries and radiological data were reviewed. Intraoperative rupture was defined as any bleeding from the aneurysm during surgery.
Results: In our study frequency of IOR was 20.20%. Most of aneurysms were located on middle cerebral artery – 107 (54.04%). Patients with IOR had higher aneurysm dome size (9.43 ± 8.39 vs. 4.96 ± 2.57 mm; $p < 0.01$) in comparison to those without IOR. Presence of blood clot on aneurysm dome was significantly associated with IOR (12.50% vs. 2.53%;

$p < 0.01$). We also observed that lamina terminals fenestration during surgery is associated with lower risk of IOR (7.50% vs. 21.52%; $p = 0.04$). Multiple aneurysms were also associated with lower risk of IOR (5.00 vs. 18.35; $p = 0.038$). Anticoagulants intake was strongly associated with risk of IOR (5.00% vs. 0%; $p < 0.01$). Glucose blood levels were also elevated in patients with IOR (7.47 ± 2.78 mmol/l vs. 6.90 ± 2.22 mmol/l; $p = 0.04$). Multivariate analysis associated that urea blood levels (OR 0.55, 0.33 to 0.81, $p < 0.01$) and multiple aneurysms (OR 0.04, 0.00 to 0.37, $p = 0.014$) were protective factors against the occurrence of IOR. Analysis also revealed that APTT (OR 1.18, 1.03 to 1.38, $p = 0.026$) was IOR predictive.

Conclusions: Factors like large dome size of an aneurysm, blood clot on aneurysm dome, anticoagulants intake and elevated glucose blood levels can be a predictive of IOR event. Performing lamina terminalis fenestration, appearance of multiple aneurysm and high urea blood levels may be associated with lower risk of such event.

Key words: intraoperative rupture, aneurysm, subarachnoid hemorrhage, clipping.

The relationship between dietary patterns, physical activity, and prevalence of the symptoms of depression, general anxiety disorder, and insomnia during the COVID-19 pandemic

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Introduction: COVID-19 2020 pandemic and modifications in daily routines it has reinforced is having major consequences for mental health, increasing the level of stress and anxiety. Lifestyle has been indicated as a preventive or provocative factor for mental health disorders. However, it has not yet been concluded whether modifications in lifestyle may relieve the mental health consequences during the time of the pandemic.

Aim of the study: The aim of the study was to verify whether there is a relationship between the amount of exercise and dietary patterns before and after the pandemic with the severity of anxiety, depression, and insomnia symptoms.

Material and methods: The study and was performed between April/May 2020. 685 respondents, aged 18-75 answered self-prepared surveys on sociodemographic data, health risks of COVID-19, the level of activity. Dietary patterns and the depression, general anxiety disorder, and insomnia symptoms were measured with standardized questionnaires: a shortened Dietary Habits and Nutritional Beliefs Questionnaire (KomPAN), Beck Depression Inventory (BDI), General Anxiety Disorder 7 scale (GAD-7) and Athens Insomnia Scale (AIS) respectively. Lifestyle surveys were answered for before and during the lockdown.

Results: Dietary patterns during the COVID-19 pandemic have not changed with significance in contrast to physical activity, which has changed significantly ($p = 0.04$). Interestingly, the correlation between the severity of depressive symptoms and amount of physical activity became more negative after the pandemic before it was equal to –0.03 and after it decreased to –0.156). The is also a noticeable correlation between the healthy diet index and the symptoms of depression, anxiety, and insomnia (correlation value = –0.12) which also further decreased during the pandemic as well as between the symptoms and if the respondents were in the risk group of COVID-19.

Conclusions: There is a weak negative correlation between a healthy lifestyle (healthy diet and amount of exercise) with the symptoms of depression, anxiety and insomnia. This may be taken into consideration in recommendations for relieving the negative impact of COVID-19 pandemic on mental health.

Key words: COVID-19, depression, GAD, insomnia.

Psychological impairments in patients with hearing loss

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Introduction: Hearing loss (HL) is the most frequent sensory deficit worldwide. Hearing loss, also called hypoacusis or deafness, is constituted by partial or total hearing disability, and may be congenital or adquire later by diseases or trauma, with psychological/neuropsychological repercussions to the patient and his/her family.

Aim of the study: To verify the frequency of complaints related to psychological/ neuropsychological and neurological changes in patients with hearing loss and to investigate the intensity of the depressive condition in an additional adults random sample.

Material and methods: This cross-sectional clinical study verified the frequency of psychological/neuropsychological and medical alterations in relation to HL, using semi-structured interviews in 1260 patients of both genders and/or family members from the University Hospital – UFSC with HL complaint, and to investigate the intensity of the depressive condition in an additional random sample of 105 adults through the Beck Depression Inventory – BDI.

Results: In children/adolescents, seizures and mental deficiency were more frequent. ADHD is less oscillating in the groups; children/adolescents showed double the frequency in memory alterations, attention and concentration, depression and convulsive crisis. Among adults and the elderly, depression, mnemonic alterations are more frequent, with 1032 cases, concentration and attention and sleep alterations (more present in those with bilateral BP), in addition to hypertension.

Conclusions: The prevalence of changes in memory, concentration and attention is related to BP, as well as to depression.
Key words: psychology, neuropsychology, hearing loss, otorhinolaryngology, depression.

Sex related differences observed in a geriatric population following a traumatic brain injury

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Introduction: Damage from a traumatic brain injury (TBI) can manifest both acutely and chronically as a range of neuropsychiatric symptoms. Early detection of these symptoms may play a crucial role in the delay of progression to Alzheimer's disease.
Aim of the study: The current study explored the associations between sex and NPI-Q scores in a TBI and without-TBI older adult cohort in order to determine the prevalence of neuropsychiatric symptoms.
Material and methods: A cognitively normal sample filtered for co-morbidities (N = 1774) was taken from the National Alzheimer's Coordinating Center (NACC) database. Patients aged 50 years and above were included in the sample, with the mean age being 68.7 in the TBI cohort, and 69.8 in the without-TBI cohort. Using generalized linear models (GLM) that were estimated by generalized estimating equations (GEE), we examined NPI-Q subdomain outcomes in a TBI (n = 266) vs. without-TBI (n = 1508) cohort. Age, sex and BMI were used as covariates.
Results: Having a TBI was associated with higher odds of exhibiting agitation, anxiety, apathy, disinhibition and aberrant motor behaviour. Females with a TBI had an increased likelihood of exhibiting anxiety, while males with a TBI had an increased likelihood of exhibiting agitation, apathy and disinhibition. Sex did not play a role in aberrant motor behaviour.
Conclusions: The areas of the brain that are responsible for controlling the aforementioned neuropsychiatric symptoms are linked through different pathway; therefore damage to any of them could cause an alteration in behaviour. The ambiguous nature of these symptoms calls for individualized therapies with a focus on sex for patients affected with TBI.
Key words: sex differences, older adult, traumatic brain injury (TBI), Neuropsychiatric Inventory-Questionnaire (NPI-Q).

Facing the stimuli one fears: a psychophysiological study

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Introduction: Exposure to threat of real or perceived danger, induces fear. In cases of phobias, this perceived fear is out of proportion to the danger posed. The anxiety evoked results in psychological (increased perception of fear) and physiological effects (increased sympathetic reactivity).
Aim of the study: Evaluating effect of emotionally aversive and attractive audio-visuals (AV) on psychological (Fear of Cockroach Questionnaire score – FCQs) and physiological (autonomic-HRV) response to fearful stimuli.
Material and methods: This interventional study used "Fear of Cockroach Questionnaire (FCQ)" by Michele Scandola *et al*. to screen 200 participants and select the study (top 28-having fear) and control (lowest 29-not having fear) groups. Change in their heart rate variability (HRV) parameters and FCQs during exposure to attractive and aversive AVs shown in random sequence 15 days apart was monitored.
Results: Responses of 57 (22 females, 35 males) 17-22 years young adults were analysed. Aversive AV, significantly decreased FCQs (p = 0.01) and average rate (AR) (p = 0.00) and increased high frequency power (HF) (p = 0.00) of the study group. Among control participants FCQs (p = 0.99) didn't change significantly whereas AR (p = 0.00) and HF (p = 0.00) showed significant increase. Attractive AV significantly decreased FCQs (p = 0.02) and AR (p = 0.00) and increased the HF (p = 0.01) of the study group. For control group change in FCQs (p = 0.99) wasn't significant whereas decrease in AR (p = 0.03) and increase in HF (p = 0.05) were significant.
Conclusions: Aversive AV significantly stimulated the parasympathetic system (decrease AR) in both groups, but AR of control participants increased instead of expected decrease due to simultaneous sympathetic stimulation. Parasympathetic stimulation in response to aversive AV (mimicking flooding) highlights the potential of flooding in treatment for phobias. Attractive AV (mimicking graduated exposure) decreases both AR and FCQs but decrease in AR and FCQs was less than aversive AV (mimicking flooding). Similar aversive stimuli post validation might be used as a therapeutic tool in phobias. Sympathetic stimulation in control group indicates that such aversive AVs should be used with precaution.
Key words: fear, phobia, HRV, FCQ.

Selecting the P-Treatment: flooding v/s graduated exposure

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Introduction: Treating specific phobias is necessary because of their disabling nature. Cognitive behavioral therapy (CBT), graduated exposure, systematic desensitization and flooding as imaginal, audio-visual (AV), interoceptive or in vivo exposures are therapeutic options for phobias. Therapeutic flooding may give immediate relief or exacerbate anxiety.
Aim of the study: Assessing response of people afraid and indifferent of cockroaches to 2 AVs mimicking graduated exposure and flooding.
Material and methods: Fear of Cockroach Questionnaire (FCQ) by Michele Scandola *et al*. was used to categorise participants into afraid or indifferent groups and measure change in cockroach fear post AV exposures. Visual analog-Valence (V) scale (scored b/w 1 to 5; 1 – unpleasant, 3 – neutral, 5 – pleasant) was used to determine the type of response (typical/ atypical) to the Avs. AV1 mimicked flooding and AV2 mimicked graduated exposure. 25 participants each, afraid and indifferent of cockroaches were shown the 2 AVs in random order 15 days apart and V rating and FCQ score (FCQs) were recorded each time.
Results: 7/25 afraid (V > 3) and 3/25 indifferent (V < 3) participants reacted to AV1 atypically. Reduction in FCQs was significantly (p = 0.0013 < 0.05) more in atypically reacting afraid participants (Mean change [MC] = –70) than in typical respondents (MC = –8.67). 3/25 afraid and no indifferent participant reacted atypically (V < 3) to AV 2. FCQs of atypically reacting afraid participants decreased (MC = –26.55) while that of typical respondents increased (MC = +4.33) but the difference wasn't significant (p > 0.05). Change in FCQs was not significantly different between indifferent participants in response to either AVs.
Conclusions: Identifying typical and atypical respondents to intended treatment is necessary, to avoid exacerbating the anxiety. Here, AV flooding (AV1) was effective in 7/25 afraid participants. Graduated exposure, considered to be a safer alternative exaggerated phobic anxiety of 3/25 afraid participants. To determine the response a phobic patient might have to the intended therapy, analysing his/ her response to AV exposures prior to interoceptive or in vivo exposure might be of help.
Key words: flooding, graduated exposure, phobia, fear.

Abating perceived fears: a psychophysiological study

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Introduction: Exposure therapies (flooding or graduated exposure) have had promising outcomes in cases of specific phobias. Comparing the psychological and physiological response to the same fearful stimuli before and after such exposure therapies in pre-clinical participants can help in selecting the better treatment option for clinically phobic patients.
Aim of the study: To compare the psychophysiological effects of attractive and aversive audio-visual (AV) exposures on perceived fear.
Material and methods: This interventional study used "Fear of Cockroach Questionnaire" (FCQ) by Michele Scandola *et al*. to select the study group and to measure the change in perception of fear (psychological response) post exposure. Aversive and attractive AV were designed to mimic flooding and graduated exposure. Galvanic Skin Response (GSR) was used as an indicator of sympathetic activity (physiological response). In each sitting, a neutral (on the basis of valence rating) image of a cockroach was shown to the participants before and after the AV exposure. Change in GSR on seeing the same image before and after the AV exposure was compared and at the end of each sitting FCQ score (FCQs) were recorded The AVs were shown in a random order at least 15 days apart.
Results: Responses of 17-22 years old 28 young adults (13 females and 15 males) were evaluated. Both aversive and attractive AV, significantly decreased FCQs (p = 0.01, 0.02 respectively) and significantly increased GSR (p = 0.00, p = 0.001). Although, the decrease in FCQs was not significantly different between the groups but the increase in GSR (and hence the sympathetic activity) was significantly less on exposure to aversive AV than on exposure to attractive AV.
Conclusions: The psychological effect (change in FCQs) of the same fearful stimuli on exposure to the 2 AVs was not significantly different. The sympathetic stimulation being less in case of aversive AV indicates that the aversive AV had milder physiological effects than the attractive AV and thus aversive AV exposures centered around commonly feared objects/ situations might be safer and more effective in treatment of phobias.
Key words: fear, phobia, entomophobia, galvanic skin response, skin conductance level.

The radiological assessment of posterior fossa structures in patients with Chiari II malformation

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Introduction: Chiari malformation type II (CMII) is a herniation of anatomical structures of posterior fossa such as cerebellar vermis, brainstem, and fourth ventricle. This abnormality is associated with the most common neural tube closure defect myelomeningocele (MMC).
Aim of the study: The aim of this study was to assess the radiological parameters of the posterior fossa of the cranium in patients operated due to CMII to find relations between them and thus establish structural indications for surgical treatment as a prevention clinical manifestation of life-threatening symptoms.
Material and methods: 18 patients (10 male and 8 female) were included in the study. They were operated on CMII between 2016-2018 in the average age of 71 months. 13 children (72%) had ventriculoperitoneal shunt (VPS) implanted due to hydrocephalus. In the study preoperative MRIs were assessed and measurements such as: McRae line (mm), depth of tonsillar herniation (mm), amount of cerebrospinal fluid (CSF) on the level of C0 (mm), presence of syringomyelia and superior cistern and the angle between superior cistern, internal occipital protuberance, and foramen magnum were evaluated. Also, the size of the fourth ventricle was calculated.
Results: VPS implantation was proven statistically significant (p = 0.0102) with the depth of tonsillar herniation. The McRae line proved a strong positive correlation with depth of tonsillar herniation and a negative correlation with the amount of CSF on the C0 level. Furthermore, a decrease in the amount of CSF on the level of C0 was correlated with a smaller size of the fourth ventricle. There was no proven connection between the age of patients and the length of the McRae line. Also, there was no proven correlation between the level of MMC and the length of tonsillar herniation.
Conclusions: Depth of tonsillar herniation should not be considered as an indication for decompression of posterior fossa as a treatment of CMII because is not adequate with the intensity of symptoms and it can be related to earlier VPS implantation and with the McRae line length.
Key words: Chiari malformation type II, posterior fossa, radiological assessment.

The dependency of the ventriculoperitoneal shunt on the time of implantation of the subcutaneous reservoir in infants with severe intraventricular haemorrhage

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Introduction: Intraventricular haemorrhage (IVH) is an effusion of blood in the germinal matrix (GMX) which is mainly located in the periventricular region of the brain. It occurs in 6-23% of preterm infants and rarely in full-terms. The risk of the IVH depends on the size of the (GMX) being highest in 23. hbd. Patients who suffered from IVH usually develops hydrocephalus 2-3 weeks after bleeding and thus need the ventriculoperitoneal shunt (VPS) as a permanent treatment. The subcutaneous reservoir (SR) is commonly implanted in these patients as a temporary treatment.
Aim of the study: The purpose of this study was to assess the mean time between diagnosis of the IVH and implantation of the SR in newborns to find optimal time of procedure which maximise the number of patients who avoided the VPS.
Material and methods: The retrospective study was conducted evaluating 20 patients (2016-2018) who suffered IVH of at least III grade in Papile's scale treated primarily with SR. The gestational age varied between 23 and 38 hbd (mean: 29 hbd, median: 28 hbd). Mean time between diagnosis and implantation was 2 weeks. As the hydrocephalus develops up to 3 weeks after the IVH, the patients were tested for the necessity of the VPS in 3 situations: SR implantation within first 2 weeks, 2-3 week or later than 3 weeks after diagnosis. The implantation of the VPS within 2 years after SR was chosen to be assessed as a primary outcome. Data were calculated using TIBCO Statistica.
Results: From among 20 patients included in this study, 10 (50%) received the VPS. Nine of all patients evaluated had the SR implanted within 2 weeks after the diagnosis, 2 and 9 patients received it between the 2 and the 3 week and after 3 week respectively. Only 2 of 7 patients who received the SR within 2 weeks needed the VPS afterwards. Implantation of the SR within the first 2 weeks after the diagnosis was proven statistically significant (p = 0.0246) as a prevention of the VPS implantation in patients who suffered severe IVH.
Conclusions: The SR implantation should be performed before the end of the 2. week after the diagnosis of the IVH as it seems to prevent from the necessity of the VPS.
Key words: subcutaneous reservoir, SR, IVH, intraventricular haemorrhage.

Case reports

Lowered level of consciousness due to bilateral paramedian thalamic infarction due to Percheron ischemia (Percheron syndrome): case report

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Introduction: In the present case, the semiological manifestations of a clinical condition called Percheron ischemia are discussed. Of rare occurrence, with few reports in the scientific literature and with significant findings during the neurological evaluation. The patient arrived at the emergency unit with a lowered level of consciousness due to bilateral paramedian thalamic infarction of the artery of Percheron. Therefore, it is a question of elucidating a case of ischemic stroke in the midbrain trunk in an unusual anatomical variant of the perforating arteries (Artery of Percheron).
Case report: Male, 67 years old, 2 days prior to the medical consultation had mild to moderate headache. On the previous day he reports a chronic cough and lowering of the level of consciousness. He was intubated (Glasgow 6) and sedated for diagnostic elucidation. At CT discrete cerebral edema was present and at MRI bilateral thalamic infarction affecting the artery of Percheron was visualized.
Conclusions: As the clinical evaluation, the means for the diagnosis of artery of Percheron occlusion should be included in the differential diagnoses: top of basilar artery syndrome, dural venous sinus thrombosis and other causes of restricted thalamic diffusion. The radiographic characteristics allow the location of the artery infarction to indicate specific propaedeutics and analysis of incidences in the regions with the greatest ischemic impairment.
Key words: paramedian thalamic infarction, Percheron's ischemia, brain arterial disease.

Primary angiitis of the central nervous system imitating glioblastoma multiforme and demyelinating disease of the central nervous system

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Introduction: Primary angiitis of the central nervous system (PANCS) is a very rare disease in which the autoimmune process causes large and medium-sized (pPACNS) or small vessels (svPACNS) to close, resulting in impaired cerebral perfusion and ischemia. In contrast, CNS tumors are the most common solid tumors in children and have the highest mortality among all cancers in this group. The differential diagnosis includes: angiocentric infections and cancers.
Case report: A 16-year-old patient was admitted to neurosurgery department with symptoms of severe, paroxysmal headaches and blurred vision that was accompanied by speech apraxia, symptoms of paresis of the upper limb, and lost consciousness several times during hospitalization. The magnetic resonance imaging (MRI) of the head revealed several irregular-shaped lesions which displayed peripheral enhancement after contrast administration. The largest multifocal change stretched multidirectionally around the triangle of lateral ventricle. The change along with the massive edema of the white matter occupied the greater part of the parietal lobe. The MRI image suggested a diffuse tumor process. The diagnosis required multiple CSF tests, CNS imaging, evoked potentials – EP, magnetic resonance spectroscopy (MRS) and above all a biopsy of the lesion. A fine-needle biopsy was non-diagnostic. Open biopsy was decisive, allowed to collect the right amount of material with appropriate inflammatory infiltration. The obtained test result indicated nonspecific inflammatory changes around vessels with T-cell infiltration. Contrary to literature reports, the MRS result was non-specific and did not contribute to the proper diagnosis of PANCS. Differential diagnosis also included PCNSL lymphoma and CNS demyelinating diseases – ADEM and multiple sclerosis.
Conclusions: Appropriate PANCS treatment guidelines are still missing. The proper diagnosis of PANCS was a diagnostic challenge due to the unclear clinical and radiological course. Heterogeneous neurological deficits required a broad differential diagnosis, given different PANCS subtypes. Diagnosis supported by biopsy of the lesion is crucial. The biopsy was diagnostically relevant and relatively safe for the patient.
Key words: primary angiitis of the central nervous (PANCS), brain biopsy, glioblastoma multiforme, magnetic resonance spectroscopy (MRS).

Giant cell tumor of clivus. Case report and review of literature focusing on transnasal transsphenoidal approach and treatment with denosumab

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Introduction: Giant cell tumors (GCTs) are locally aggressive primary osteolytic neoplasms which most commonly involve epiphyseal regions of long bones. Localizations involving skull bones are very rare: only 0.51% of GCTs affect cranial bones, most commonly the sphenoid and temporal bones in the case of skull bone involvement. Although histologically GCTs are benign lesions, they present local recurrence and a significant metastatic potential.
Case report: 26-years-old female was admitted to department of neurosurgery with diagnosed tumor of clivus and sella turcica. She complained about headache, diplopia and

oligomenorrhea lasting for months. Magnetic resonance imaging (MRI) of head revealed giant solid-cystic tumor of clivus, sella turcica and sphenoid sinus area. The endoscopic transnasal transsphenoidal surgery (TNTS) was performed. Operation via such an approach in case of GCT to be extremely rare. Histopathology revealed GCT of sphenoid bone, Campanacci 3 with secondary aneurysmal cyst. The H3F3A gene mutation was found which confirmed the diagnosis. There is no guideline for treatment of intracranial GCTs. The undertaken procedure included: gross total resection, drilling the surrounding healthy bone, and an adjuvant therapy with denosumab. Denosumab is RANKL, ie. an inhibitor approved for treatment of unresectable tumors. In case of subtotal gross resection, the possible recurrence is 55%, but denosumab reduces this risk. GCT is a very rare tumor in the intracranial location, and literature reports do not opt for any surgical method. The literature reports mention barely a few cases of TNTS approach in GCT. The case of our patient is another one operated on by this approach with a successful result. The analyzed case shows a satisfactory outcome of this treatment with denosumab and TNTS, with no recurring GCTs after subtotal resection.
Conclusions: The transsphenoidal approach may be an appropriate surgical access to the sphenoid and clival bone GCT. The result of the use of denosumab showed no recurrence both in the report of our case and in the analyzed group of patients, therefore giving the prospect of suppressing the recurrence of GCT.
Key words: giant cell tumor (GCT), Clivus, denosumab, transnasal transsphenoidal surgery (TNTS).

Pontine hemorrhage associated with hypoglossal nerve injury in a comatose patient: case report

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Introduction: Primary pontine hemorrhages (PPH) have epidemiology in hypertensive individuals, most of whom have no previous symptoms of cerebral vascular disease (stroke). In view of the various types of intracerebral hemorrhage, pontine hemorrhage has the worst prognosis, due to its main manifestations: coma, open mindedness, respiratory disorder and abrupt lowering of the level of consciousness. In this sense, we report a case of a patient with a reduced level of consciousness, in a comatose state, brought to the emergency, manifesting changes in the motor of the tongue.
Case report: A male patient was admitted to the emergency room, accompanied by neighbors with reports of decreased level of consciousness (RNC). The night before, the patient was asymptomatic, denying fever or flu-like symptoms in the last days. History of comorbidities: Systemic Arterial Hypertension (SAH) in irregular use of Losartan and Hydrochlorothiazide. Abusive alcoholic and smoker. Upon admission of the patient: Glasgow 8 (AO 2 RV 3 RM3), pupils isofotorreagent, Blood Pressure (PA) 180 x 100 mg, Heart Rate (HR) 89 bpm, Respiratory Rate (FR) 17 irpm, Sat 98% in room air. Painless abdomen on palpation and palpable pulses at the 4 extremities. Cortical function: comatose state. Examination of gait, coordination and muscle strength: it was not possible to assess. Normal muscle tone. Absence of atrophies and fasciculations and preserved exteroceptive reflexes. Sensitivity assessment was not possible. Normal ophthalmoscopy. Alteration present in the movement of the tongue spontaneously with deviation to the right. Kerning and Brudzinsk absent. Conduct performed: computed tomography (CT) scan without skull contrast was requested, which showed: a small hyperdense image in the posterior region of the bridge, suggesting a hemorrhagic focus. Laboratory exams and the Intensive Care Unit (ICU) activated.
Conclusions: The evaluation of neurological semiology and the findings presented in the neuroimaging are fundamental in the identification of the patient's condition, as well as the location of the brain lesion that progresses with the development of the signs and symptoms presented by the patient.
Key words: brain stem hemorrhage, pontine hemorrhage, hypoglossal nerve injury.

Difficult Immunomodulatory treatment of relapsing-remitting type of multiple sclerosis

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Introduction: Multiple sclerosis (MS) is a disabling, immune-mediated inflammatory disease that cause demyelination of the central nervous system. According to the European Multiple Sclerosis Platform, 700,000 individuals in the Euorope and 400,000 in the USA are affected by MS. Symptoms of MS may often vary. Some patients have a predominance of cognitive changes, while others present with classic Charcot triad of intention tremor, dysarthria and nystagmus or just simple fatigue and dizziness which appear in most of cases of MS.
Case report: 34-year-old male patient presented to the neurological surgery of Rydygier Hospital in Cracow complaining of hyperaesthesia and paraesthesia which he located on his lower left limb. After one month numbness of whole right half of the body progressing to right hemiparesis has appeared. On examination: exaggerated patellar reflexes and no plantar reflexes bilaterally, altered tactual sense below Th5, gait and laboratory tests were normal except elevated levels of hepatic transaminases. Due to specific conditions patient was reffered to MRI: Multiple demyelination changes supratentorialy (mostly periventricularly), one focal lesion in pons and two focal lesions with one gadolinium positive located in cervical cord. Relapsing-remitting type of MS was diagnosed with inclusion of interferon-1b. In further MRI controls: 4 new focal lesions with two Gd positive and after one year six new focal demyelated lesions with three Gd positive. Patient was qualified to change immunomodulatory therapy firstly to glatiramer acetate secondly to dimethyl fumarate thirdly to teryflunomide. Due to persistent clinical and MRI activity patient was qualified to ocrelizumab therapy.

Conclusions: Immunomodulatory therapies have shown positive effects in patients with RRMS, including reduced frequency and severity of clinical attacks. These drugs tend to slow the progression of disability and reduce accumulation of lesions within the brain and spinal cord. Hence wide spectrum of clinical manifestations that MS produces patients have to be treated comprehensively.
Key words: multiple sclerosis, immunomodulatory therapy.

"People think that I stink..." Olfactory reference syndrome – diagnostic problems. Case study

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Introduction: Olfactory reference syndrome (ORS) is a psychiatric condition characterised by the false belief that the individual emits foul or offensive body odor. It is estimated that 0.5-2% of the population might be affected by this disorder. Nevertheless, considering the latest statistical data, ORS is presumably underdiagnosed. We still lack the information enabling us to fully understand the association between ORS and other diseases. In the upcoming International Classification of Diseases (ICD-11), ORS is for the first time distinguished as a separate diagnostic category and included in "Obsessive-Compulsive and Related Disorders" section.
Case report: We present a case of a 25-year-old male with the diagnosis of olfactory reference syndrome with partial insight. He reported a family history of anxiety and mood disorders. The patient had symptoms since he was 18. He presented to a psychiatrist for the first time at the age of 22 because of persistent thoughts and preoccupation with his body odor. He had the impression that other people can smell his body odor, although he had never smelt it himself. He misinterpreted other's behaviours like touching nose or opening a window, as being referential to him. He had the feeling of being observed. The patient presented severe anxiety symptoms and compulsive behaviours – multiple showering, washing hands and changing his underwear. Obsessive thoughts and compulsive behaviour took him a few hours a day. Due to the character of symptoms and only partial insight, the patient was initially diagnosed with psychotic disorder. He was started on treatment with risperidone which turned out to be inefficient. A year later, on the basis of the same symptoms, he was diagnosed with obsessive-compulsive disorder and prescribed fluvoxamine. The patient partially responded to this treatment. A year after stopping the treatment, he presented to a psychiatrist two more times due to anxiety symptoms, sleep disorder and racing thoughts. He didn't present ORS symptoms anymore.
Conclusions: This case illustrates the problems arising from the inconsistencies in defining obsessive disorders. According to ICD-10, in contrast to DSM-V, to diagnose OCD an individual needs to recognize symptoms as his own thoughts or impulses. The lack of explicit diagnostic criteria may result in a delay in correct diagnosis and proper treatment. In this case, the family history, the course of the disease and the response to the treatment indicate considering ORS as one of OCD related disorders.
Key words: olfactory reference syndrome, ORS, obsessive-compulsive disorder, OCD, ICD-11.

Anatomical abnormalities at wrist can mimic carpal tunnel syndrome – importance of ultrasonography in differential diagnosis

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Introduction: Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy affecting about 3% of adult population. It is caused by compression of the median nerve int he carpal tunnel. The typical symptoms include numbness, pain and paraesthesias occurring in the median nerve sensory area of the hand as well as weakness and atrophy of thenar muscles. Electrophysiology may reveal even slight disturbances in median nerve conduction through the tunnel and are considered to be the gold standard in diagnosing CTS. Recently however the high resolution ultrasound (HRUS) gained attention as valuable adjunctive diagnostic method capable of detecting morphologic changes not visible in the electrophysiology.
Case report: We present a 74-year old man with end stage renal failure with a fistula in left forearm, with surgical decompression of left CTS in the past, who was referred to our department due to recurrence of CTS symptoms. Electrophysiology revealed marked prolongation of median nerve distal motor latency along with decrease of CMAP amplitude and the absence of sensory response. Surprisingly, HRUS revealed normal cross-sectional area of the median nerve without compression in the tunnel. The nerve was howerer compromised by by additional belly of palmaris longus muscle. Additionally, an aneurysm of persistent median artery was observed about 1 cm proximally to the distal wrist crest.
Conclusions: This case demonstrates utility of HRUS in revealing unusual causes of median nerve compression at the wrist in some patients with symptoms and electrophysiologic tests suggestive of CTS. HRUS may help to avoid needless attempt to transect carpal ligament and may indicate proper surgical management.
Key words: carpal tunnel syndrome, high resolution ultrasound.

Differential diagnosis of syncope: is it a piece of cake?

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Introduction: Syncope is one of the most common causes of admissions to the emergency department. Based on the statistics, it affects nearly 39% of the population. The pathophysiology of syncope is brain tissue hypoper-

fusion, whose causes are classified in one of the 5 main categories: cardiac, orthostatic, neurological, vasovagal or unknown one, with the last category appearing most frequent.
Case report: Woman, aged 52, sought medical attention due to multiple episodes of syncope without complete loss of consciousness, which appeared for the first time a couple of months ago. The clinical presentation of symptoms was not specific. Based on the given characteristics, a vasovagal syncope was the most probable one. When inquired about her family history, the woman significantly reported her grandmother's and aunt's sudden deaths of unspecified etiology. The woman was under the care of a psychiatric outpatient clinic because of depression. The patient was admitted to the hospital for further diagnosis mostly due to the family loaded anamnesis. Physical examination, orthostatic and laboratory tests showed no pathologies, neither did abdominal ultrasonography, chest X-ray and head computed tomography. In the ECG examination, the sinus rhythm was registered. Echocardiography revealed a 15 × 13 mm pedunculated lesion, which was deemed a cardiac myxoma owing to its features and typical location in the left atrium. The tumor was resected immediately. Two months after the operation, the woman started to complain about symptoms of supraventricular tachyarrhythmia, most likely due to the surgery itself. No more episodes of syncope were observed. Now the patient is under the care of an electrocardiologist.
Conclusions: Several aspects of the case study require emphasis. First of all, it enhances the role of a reliable anamnesis even more. Further, the study indicates the need for more detailed and newer research into the familial occurrence of cardiac myxomas, as the vast majority of the research conducted to date is more than 10 years old. Last but not least, it shows how broad the range of differential diagnosis of syncope should be, with rare causes included.
Key words: syncope cardiac myxoma sudden death.

Hyponatremia secondary to escitalopram-induced SIADH – a case study

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Introduction: Hyponatremia is a well-established and life-threatening side effect of selective serotonin receptor uptake inhibitors (SSRI). However, its occurrence secondary to syndrome of inappropriate antidiuretic hormone secretion (SIADH) induced by escitalopram, has been rarely reported in the literature. Because of constant growth of depressive disorders in the society, especially among elder patients, and wide use of SSRIs in the treatment protocols reporting rare and adverse effects is necessary.
Case report: We report the case of 91-years old female who presented with symptoms of cognitive impairment (Clock Drawing Test, CDT – 3/7; Time Up and Go, TUG – 14 seconds; Activities of Daily Living, ADL 5/6; Mini-Mental State Examination, MMSE – 21/30) with coexistence of rheumatic pain, cholecystitis, gastroesophageal reflux disease (GERD), chronic obstructive pulmonary disease (COPD) and hypertension which was the primary cause of the appointment. Throughout multidrug therapy which consisted of more than ten different medications escitalopram was prescribed for worsening symptoms of cognitive impairment what resulted in hyponatremia (129 mmol/l). Hyponatremia was associated with dizziness and falling. Despite, withdrawal of escitalopram and modification of SSRI therapy once induced hyponatremia was constantly present with ups and downs (range: 124-134 mmol/l) within 2 years of follow-up.
Conclusions: Geriatric patients are often prone to severe side effects due to multidrug therapy. As a physician it is crucial to be aware of possible rare complications and drug interactions. Moreover, it is important to control natrium level among patients taking SSRIs. The knowledge of preventing adverse effects by implementation of the best possible pharmacological therapy for every individual and treating them in case of occurrence is principal.
Key words: hyponatremia, SSRI, escitalopram, SIADH.

Stroke in the mechanism of air embolism – it can happen!

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Introduction: Stroke is a medical condition in which blood flow to the brain is blocked that results in cell death. Apart from widely known causes of stroke clinicians sometimes may face the atypical one – air embolism. Stroke can be caused by air introduced into the vascular system and becomes lodged within the vessels and may impede the blood flow to brain parenchyma.
Case report: 23-year-old patient with history of acute pre-T lymphoblastic leukemia and mediastinal tumor was admitted to the Hematology Ward of the Rydygier Hospital due to continuation of previous oncological treatment. The planned chemotherapy was performed. After removing the central venous catheter with an interval of about 20 minutes, the patient developed shortness of breath, anxiety and a feeling of bubbling- spilling sensation in the chest, subsequently the upper left limb paresis and droop left corner of the mouth appeared. His blood pressure was 115/75 and heart rate was 140, very low saturation of 65%. On auscultation murmur 4/6 over the whole heart. CT scan of the head without contrast revealed no the presence of intracerebral or cerebral hematoma, normal brain density, ventricular system without displacement and pressure features. In the tomography of the cavernous sinuses, gas bubbles were visible on both sides. Due to the overall clinical picture and the results of additional tests, the patient was diagnosed with air embolism.
Conclusions: Air can enter the arteries bed directly from the chest or abdominal trauma, or be introduced during medical procedures like central line placement, hemodialysis line placement, intravenous contrast injection or pacemaker/defibrillator placement. The most widely agreed-upon treatment is emergent hyperbaric therapy. To conclude air embolism occurs mainly as a complication of invasive vascular

procedures and is a rare but potentially fatal phenomenon and clinicians should be aware of the possibility of such ailment, its early diagnosis and treatment.
Key words: air embolism, stroke, brain.

Pituitary adenoma apoplexy: case report

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Introduction: Apoplexy of pituitary gland is a rare complication of adenoma. It is estimated that 10% of affected are men between 37-57 years of age. Magnetic resonance imaging (MRI) is more sensitive imaging study than computed tomography scan (CT scan). Condition can be complicated with pituitary hormones deficite, optic nerve compresion and others.
Case report: A 50-year-old woman came to Pauls Stradins Clinical University Hospital Emergency Department due to headache (Numerical Rating Scale 4 points) and vision loss in her left eye and cloudy vision in the right eye. She experienced nausea and vomiting, headache (Numerical Rating Scale 10 points) and vision loss in the left eye 4 days ago. Complains disappeared later same day. Neurological examination revealed left eye's fixed "dilated" pupil. Hemorrhage in pituitary fossa was confirmed by CT scan. Next day MRI was performed where pituitary apoplexy of pituitary macroadenoma was diagnosticed. An urgent transsphenoidal pituitary adenoma apoplexy extirpation was made. A patient noted a return of vision in a left eye. An endocrinologist consultated the patient and diagnosed secondary adrenal insufficiency and secondary hypothyroidism. Considering clinical manifestations and laboratory findings the patient was discharged from the hospital with recommendations to make a MRI after 6 months and to visit a neurosurgeon after; to use Prednisolone and L-Thyroxin as hormone substitution therapy; to do blood analysis follow-up (fT3, fT4, TSH, Cortisol, ACTH, electrolytes, plasma osmolarity) and to visit an endocrinologist after blood analyses results.
Conclusions: Apoplexy of pituitary macroadenoma is a rare condition that can lead to insufficiency of pituitary gland hormone production. Headache and vision problems are often symptoms of apoplexy. In case of haemodynamic instability and/or reduced vision surgical treatment is required.
Key words: apoplexy, headache, pituitary macroadenoma, vision deficit.

Acute ischemic stroke in posterior inferior cerebellar artery in a young woman: case report

Alise Baborikina

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Introduction: Stroke in young patients is uncommon, comprising 15% of all stroke patients. Stroke in posterior inferior cerebellar artery is even more uncommon and accounts for about 1.5% of all stroke cases.
Case report: A 22-year-old woman was admitted to Pauls Stradins Clinical University Hospital Emergency Department with headache, nausea and neck pain. She had a previous medical history of migraine since 14-years old and was also taking oral contraceptive pills (Drospirenone). In addition neurological examination revealed no abnormalities (Glasgow Coma Scale (GCS) = 15) but the initial computed tomography scan (CT scan) showed ischemia in right cerebellar lobes. The patient was hospitalized in Stroke Unit and magnetic resonance imaging (MRI) was performed the next day. After 2 days the patient's condition was worsening (GCS = 11, ophthalmoparesis and dysarthria). CT scan was done and it showed obstructive hydrocephalus and acute ventriculostomy was performed. There were no complications during the procedure, and the next day patient's condition improved. Early rehabilitation after surgery was started and after a week ventriculostomy was evacuated. Considering clinical manifestations and laboratory findings the patient was discharged from the hospital with recommendations and early post stroke rehabilitation was started.
Conclusions: Young patients with posterior circulation stroke may not show early neurological abnormalities but observation is neccessary. One of the most dangerous complications in cerebellar stroke is obstructive hydrocephalus that can lead to brainstem compression however it could be prevented by early ventriculostomy.
Key words: CT scan, hydrocephalus, posterior circulation stroke.

The iatrogenic aneurysm of pericallosal artery after endovascular treatment

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Introduction: Intracranial aneurysms are estimated to occur in 3% of the global population. One of the rare causes of aneurysms development may be iatrogenic arterial injuries. Herein we report the first described case of the iatrogenic pericallosal artery aneurysm treated with stent assisted coiling. This aneurysm was caused by a microwire artery wall dissection during the endovascular treatment of another aneurysm.

Case report: A 50-year old woman with subarachnoid hemorrhage was admitted to the Department of Neurosurgery. Computed tomography angiography confirmed the presence of a small anterior communicating artery aneurysm. The patient was qualified for endovascular treatment with the balloon assisted coiling. During the procedure the tip of a microwire inserted into balloon catheter placed in the left pericallosal artery caused a local injury and vasoconstriction over a length of 1.5 mm, without flow disturbances visible in DSA. 1 year after the endovascular procedure a dissecting aneurysm in the place of the previous vasoconstriction of the left pericallosal artery was revealed. After 5 days the patient was commenced on standard dual antiplatelet therapy. Stent assisted coiling of the pericallosal artery aneurysm was performed. After 6 months the patient underwent DSA examination that showed entirely cured pericallosal artery aneurysm and the improvement of the expansion of the parent vessel.
Conclusions: This this the first case of confirmed iatrogenic (post endovascular procedure) cerebral aneurysm successfully treated with another endovascular intervention.
Key words: aneurysm, endovascular treatment, iatrogenic aneurysm.

Endovascular treatment of vein of galen aneurysmal malformation with onyx embolisation system and platinum coils

Toms Klinovics

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Introduction: The vein of Galen aneurysmal malformation (VGAM) is a rare congenital, cerebral, arteriovenous malformation of the embryonic choroid plexus. The malformation represents less than 1% of all arteriovenous malformations and less than 800 cases in total have been reported. Technological and technical advancements in diagnostics and endovascular treatment options have provided a more optimal clinical outcome of the disease.
Case report: Patient, two years old female, admitted to hospital for planned digital subtraction angiography (DSA) for diagnostic clarification, with a history of congenital hypertrophic cardiomyopathy, pulmonary hypertension and acute heart failure. Magnetic resonance imaging was performed during the first month of life, displaying a bulge in the pineal gland area, that raised suspicion of an arteriovenous malformation. During admission the patient showed signs of hydrocephalus, delayed speech development and ongoing headaches. DSA showed pathologically dilated and curved arteries, an arteriovenous shunt from a. cerebri posterior to v. Galeni and a drainage to the venous shunts. The diagnosis of VGAM was confirmed. Two months later, endovascular embolization of the VGAM was performed. During the procedure an arteriovenous malformation with a fistula and a gigantic aneurysm in the area of v. Galeni was observed. Total occlusion of the aneurysm and arteriovenous malformation was achieved. Patient was discharged of the hospital 4 days after treatment. A follow up DSA was performed one year after the procedure, showing a complete occlusion of the arteriovenous malformation with no signs of recanalization.
Conclusions: A multidisciplinary approach is recommended, regarding the diagnostic and therapeutic complexity the disorder presents. The clinical case suggests that congenital heart defects combined with neurological disturbances can arise suspicion of vein of Galen aneurysmal malformation. Endovascular embolization represents the first choice of treatment and provides the best option for correcting the hydrodynamic disorder.
Key words: vein of Galen malformation, aneurysm, endovascular embolization, interventional radiology.

Possible acute disseminated encephalomyelitis: a case report and follow-up

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Introduction: Acute disseminated encephalomyelitis (ADEM) is a rare acute demyelinating disease commonly preceded by infection or vaccination. The key clinical features of ADEM are the acute and rapid progression of encephalopathy and multifocal neurological findings. There are no specific biomarkers or confirmatory tests and ADEM is considered to be a diagnosis of exclusion.
Case report: A 52-year-old woman after a month of unknown sickness woke up with a sudden numbness and weakness of the right part of her body. At the admission her body temperature was 37.0 and mild hemiparesis/hemihipestesia of the right limbs was detected. A thorough examination was without major findings; brain CT showed no pathology; cerebrospinal fluid (CSF) examination was inconclusive with pleocytosis 26 mkL (0-6).The patient received empirical treatment with acyclovir and ceftriaxone until excluding viral or bacterial infection based on negative test results. Brain MRI revealed multiple disseminated demyelinating lesions but spinal cord remained intact. Stroke and oncology were excluded. Considering possible acute demielinating disease treatment with methylprednisolone 1 g/daily for 5 days was performed and the improvement had been achieved. Control spinal tap was made on the nineth day with pleocytosis 10 mkL. Oligoclonal bands were positive both in CSF and serum. Patient was discharged home after 18 days of hospital treatment. Repeated brain and spinal MRI after two months did not show new lesions.
Conclusions: In this clinical case of ADEM patient was presented at the uncommon age and without any trigger information in the past. Such markers as oligoclonal bands were found, but they were not valuable for diagnostics. The diagnosis of ADEM was based on MRI and CSF findings and the patient's state of health improved after methylprednisolone therapy. ADEM's early diagnosis and treatment allow to improve the outcome, but the further investigations are necessary.
Key words: acute disseminate encephalomielitis, oligoclonal bands, neuroimaging.

A 19-year-old patient with physiological anisocoria

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Introduction: A difference in pupils size between the eyes is known as anisocoria. Unequal pupils (anisocoria) may be physiological, pathological or pharmacological. Physiological anisocoria is common: approximately 20% of normal people have different-sized pupils. Examples of pathological causes include Horner's syndrome, Argyll Robertson pupil, Adie's tonic pupil, iris damage and third-nerve palsy. Pharmacological anisocoria is caused by accidental or deliberate application of mydriatic drugs. Transient anisocoria can be related to migraines.
Case report: We report a 19-year-old male patient with anisocoria. This symptom was observed for the first time during routine ophthalmological check-up because of myopia. The use of new medications, previous or current malignancies and neck trauma were excluded. The full ophthalmological examination was performed (visual acuity, visual fields to confrontation, extraocular motility, whether or not ptosis is present, test with pilocarpine 0.1%, pupillometry, slit lamp examination). No pathological changes were found. The difference in pupillary diameter was 1mm. Also, neurological examination, as well as MRI scan, were performed without any abnormal findings. The patient was diagnosed with physiological anisocoria.
Conclusions: In all patients with anisocoria it is important to rule out pathological causes. A difference in pupils size may be related to life-threatening conditions.
Key words: anisocoria, physiological anisocoria, ophtalmologic examination.

Defects in the structure of circle of Willis as a risk factor of epileptic seizures: case report

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Introduction: Anomalies of circle of Willis (CoW) are very common. Only about 40% of population has complete CoW. The most common variations of the anterior communicating artery include absence, duplication, hypoplasia or triplication. Absence of anterior communicating artery is found in less than 3% of patients. The percentage of anomalies is higher in patients suffering from mental disorders or white matter diseases. Defects of cerebral vessels might also be the cause of brain tissue damage leading to epileptic seizures (ES). One of the recommended diagnostic methods of epilepsy is head magnetic resonance angiography (MRA). Mapping the T2 signal with flair modification is the most significant as it improves the sensitivity of the method. Pathomorphological results shows that in most of patients with epilepsy the hippocampus sclerosis is presented with a typical symptom of increased T2 signal in magnetic resonance imaging (MRI). The results of MRA showed defects in structure of CoW: hypoplasia of right vertebral artery, absence of anterior communicating artery, posterior communicating artery and left posterior cerebral artery. Also single nonspecific minor demyelination in the white matter known as microangiopathy. The T2 and T2-flair signals were increased bilaterally.
Objective: Presentation of anomalies of cerebral arterial circle as a risk factor of ES.
Case report: Clinical case of 65-year-old female with history of ischemic stroke, persistent hemiparesis, chronic heart failure, peripheral hypertension and peptic ulcer disease, presented with generalized ES lasting for a week.
Conclusions: Defects of CoW may cause ES. Screening MRI angiograms are essential to detect the anomalies in order to implement treatment to minimize negative effects of probable future seizures episodes.
Key words: circle of Willis (CoW), anatomical variations, epilepsy, magnetic resonance angiography (MRA).

Case report – sulfonylurea poisoning mimicking vertebrobasilar acute ischemic stroke

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Introduction: The aim of our study was to describe the case of the man with sulfonylourea induced hypoglycemia manifesting as acute encephalopathy with focal neurological signs misdiagnosed as posterior circulation acute ischemic stroke (AIS).
Case report: A 64-year-old patient treated with glimepiride (2 BID) for type II diabetes mellitus, after radical prostatectomy for prostate cancer, was admitted to Stroke Unit. Upon admission, patient was unconscious, with upward gaze deviation, four-limb paresis, extensor response to pain, bilateral positive Babinski's sign. Non-contrast head CT and CT-angiography did not reveal any abnormalities. Low serum glucose level (46 mg/dl) was noted and corrected with intravenous glucose infusion (80 mg/dl). Based on acute onset of focal neurological signs the initial diagnosis of AIS was made. Due to exceeding of treatment window no reperfusion therapy was performed. In further serum glucose measurements hypoglycemia was noted. For the next 72 hours repeated intravenous glucose infusions were needed to maintain it's levels above 70 mg/dl. Magnetic resonance head imaging performed in 3rd and 7th did not reveal ischemic changes. Hypoglycemic encephalopathy due to glimepiride poisoning was diagnosed.
Conclusions: In our case, perioperativelly taken sulfonylureas resulted in prolonged hypoglycemia misdiagnosed as AIS. Prolonged insufficient brain nutrition can result in permanent or long-lasting brain damage, manifesting itself as impaired consciousness and focal neurological signs.
Key words: sulfonylurea, poisoning, mimicking, vertebrobasilar, stroke.

Patient with intracranial aneurysms and double middle cerebral artery – a case report

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Introduction: Prevalence of intracranial aneurysms varies between 1-5%. Their most common localization are anterior communicating artery (ACoA) and middle cerebral artery (MCA). Moreover, duplication of MCA (DMCA) is one of the most common MCA anomaly with prevalence of 7%. Even though that MCA is one of the most common sites of aneurysm, there is little information about clinical significance of DMCA.
Case report: We present a case of female patient with hypertension and psoriasis, who presented with impaired sensation on the right side of face. MRI and angio-CT revealed an aneurysm of ACoA, hence our patient was qualified for angiography. It exposed right-sided saccular aneurysm on the internal carotid artery (ICA). Angiography also revealed ACoA and anterior cerebral artery (ACA) aneurysm and left MCA aneurysm with MCA and duplicated MCA. Moreover, the additional MCA arised before the bifurcation. Left-sided ACA aneurysm was secured by endovascular coiling. On the right side, due to shape of aneurysm and high-suspicion of endovascular treatment failure, the surgical clipping was method of choice. Aneurysm was found on the medial part of ICA and was clipped. Fluorescein videoangiography was performed to check if aneurysm was accurately clipped. As there was no flow in aneurysm dome, it was removed. Both interventions had no additional side effects and both ended up with success despite occurrence of double MCA.
Conclusions: Influence of the double MCA on interventions themselves, their difficulties and their follow up is yet to be established. Both angiography and videoangiography should be performed in case of complex vascular abnormalities.
Key words: intracranial aneurysm, endovascular coiling, surgical clipping, double MCA.

Psychiatric presentation of primary cerebral non-Hodgkin's lymphoma: case report

Adelė Butėnaitė

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Introduction: Primary central nervous system lymphoma (PCNSL) is a rare cerebral tumour, comprising about 3-5% of all central nervous system (CNS) tumours. In some regions of the world the incidence of PCNSL has risen threefold, which can not be fully atributed to advances in diagnostic techniques or an increased prevalence of immunosuppressive states. The most common type of PCNSL is a diffuse large B-cell lymphoma (DLBCL), which is a non-Hodgkin's lymphoma, mostly diagnosed in elderly population. DLBCL is an agressive tumour and it is known for its poor prognosis, though five year survival rate has increased since introduction of high-dose methotrexate (HDMTX) chemotherapy regiment. Brain tumours cause general symptoms due to mass effect and an increase of intracranial pressure, also focal symptoms, which depend on a precise location of a lesion. PCNSL can cause a wide array of psychiatric symptoms, such as cognitive dysfunction, apathy, affective or anxiety disorders, eating disorders, mania and psychosis. Psychiatric symptoms can be the first manifestation of the PCNSL, presenting weeks or months before any neurological signs. Owning to this, patients can often be misdiagnosed with a primary psychiatric ilness, such as depression, bipolar disorder or schizophrenia. The main cause of psychiatric symptoms in PCNSL patients are tumour mass effect on different brain regions, though such symptoms can also present due to the neurotoxicity induced by chemotherapy and radiotherapy treatments.
Case report: 39 years old man with no previous health issues sought psychiatric help due to a loss of motivation and interest in his job, decreased appetite and insomnia. Relatives reported that for about a month patient had markedly lower energy levels and showed a general disinterest in various activities. Considering such clinical presentation, depression was suspected and antidepressant drug Mirtazapine (noradrenergic and specific serotonergic antidepressant) was prescribed. After two weeks patient discontinued the use of Mirtazapine, because of no significant improvement in his condition. After two more weeks patients condition started quickly worsening, he experienced delussions, hallucinations and moments where he could no longer recognise his family members. He was addmited to the hospital, where computed tomography (CT) scan was performed. Results showed 4 × 4 × 4 cm size lesion in the left frontal lobe. Magnetic resonance imaging (MRI) was performed in order to evaluate lesion more precisely. Results showed lesions in the left frontal lobe, the suprasellar cistern, the third and the fourth ventricles. Cerebral lymphoma was suspected and the results of stereotactic biopsy confirmed the diagnosis of a diffuse large B-cell lymphoma (DLBCL). Patient was admited to the centre of haematology, where chemotherapy regime based on a high-dose methotrexate (HDMTX) was started. Positron emission computed tomography (PET-CT) showed positive metabolic response and cytoreductive reaction. Treatment with HDMTX was continued, though in a course of it patient experienced a marked change in his behavior and psychiatric state. He became agressive, had ideas of grandiosity, started sleeping less and had an increased appetite. He experienced episodes of agitation, where he became non-complient with the treatment and tried to leave the hospital. After such episodes he experienced confabulations and pseudo-reminiscences. Patient was admitted to the psychiatric ward for state re-evaluation and treatment correction. He received treatment with antipsychotic medication and psychotherapy, after which his state became more stable. Patient still showed some ideas of grandiosity and an increase in appetite, though his agitation and aggression lessened. He was transferred to haematological ward to continue chemotherapy treatment. Patient received 5 HDMTX and 2 HDAraC-R-TT (high-dose ara-cytarabine, rituximab, thiotepa) courses, but lymphoma was refractory to such treatment and progressed further. Chemotarapy was switched to DA-TEDDi (temozolomide, etoposide, doxil, dexa-

methasone, ibrutinib and rituximab) regime, though it did not stop the progression of the disease. Radiotherapy was suggested, but was not applied, since patient's state was rapidly deteriorating. He experienced generalized tonic-clonic seizures, which progressed to status epilepticus and coma state, after which he received only palliative care.

Conclusions: Cerebral lesions can be associated with various psychiatric symptoms. Such symptoms can be caused by a direct effect of the tumour on different brain structures, as well as radiotherapy and chemoterapy treatments, which are usually aggresive, considering poor prognosis of the disease. Comorbid psychiatric ilnesses can worsen the course of primary disease, decrease patient's quality of life and lead to a worse overall prognosis. It is important to recognise such symptoms and treat them separately with psychopharmacological interventions, psychotherapy and psychoeducation.

Key words: lymphoma, tumour, psychiatry, depression.

Physiotherapy

(Polish language session)

Jury:

dr Joanna Zyzanwska
dr Marta Barłowska-Trybulec
prof. dr hab. Roman Nowobilski
prof. dr hab. Jolanta Jaworek
prof. dr hab. Tadeusz Gaździk
dr Jarosław Amarowicz
prof. dr hab. Jan Bilski

Coordinators:

Weronika Bartecka, Gabriela Juraszek

List of papers:

Dyspareunia i wykorzystanie fizjoterapii w jej leczeniu w świadomości Polek

Joanna Siereńska

Tutor: Magdalena Emilia Grzybowska

Zakład Fizjoterapii, Wydział Nauk o Zdrowiu, Gdański Uniwersytet Medyczny, Gdańsk, Polska

Introduction: Dyspareunia to uporczywy i nawracający ból związany z próbą lub dokonaniem penetracji pochwy. Jest zaburzeniem występującym u około 10% kobiet. Istnieje wiele przyczyn tej dolegliwości. Nierozerwalność sfery psychicznej i fizycznej sprawia, iż problem ten wpływa na jakość życia kobiet.
Aim of the study: Ocena świadomości kobiet w Polsce na temat dyspareunii i możliwości jej leczenia z wykorzystaniem fizjoterapii.
Material and methods: Przeprowadzono internetową ankietę Google i rozpowszechniono ją przy użyciu portalu społecznościowego Facebook. Kwestionariusz zawierał zestaw autorskich pytań obejmujących znajomość zagadnienia dyspareunii, metod jej leczenia, w tym fizjoterapii.
Results: Ankietę wypełniło 218 kobiet w wieku średnio 26,8 ± 6,8 roku, o średnim BMI 22,5 ± 3,4 kg/m^2. Wykształcenie wyższe zadeklarowało 176 (80,4%) badanych, średnie 38 (17,4%). Wśród badanych było 77 (35,3%) kobiet z dyspareunią i 141 (64,7%) bez dyspareunii. Problem dyspareunii zgłosiły ginekologowi 32 (41,6%) respondentki, 14 (18,9%) fizjoterapeucie, 36 (46,8%) nie szukało pomocy medycznej (p = 0,01). Średni ból zgłaszany przez kobiety wyniósł 5,4 ± 2,1 w skali NRS (*Numerical Rating Scale*). Średni NRS wynosił odpowiednio 6,3 ± 2,0, 6,4 ± 2,1 i 4,7 ± 1,7 dla pacjentek poszukujących pomocy u ginekologa, fizjoterapeuty i nieposzukujących pomocy (p < 0,001). O fizjoterapii uroginekologicznej słyszało 35 (45,5%) kobiet z dyspareunią i 53 (37,7%) kobiet bez dyspareunii (p = 0,07). U 21 (27,3%) kobiet z dyspareunią zdiagnozowano jej przyczynę. Według 164 (75,2%) ankietowanych bolesne współżycie jest problemem medycznym, a 128 (58,7%) uznało je za temat wstydliwy. Brak wiedzy na temat fizjoterapii podało 88 (40,4%) ankietowanych, 72 (32,9%) wiedzę małą, umiarkowaną 42 (19,3%), dużą 12 (5,5%), a zaledwie 4 (1,9%) wiedzę bardzo dużą. Fizjoterapię za istotną w leczeniu dyspareunii uznały 102 (47%) kobiety, za nieistotną 3 (1,4%), a 113 (51,6%) nie miało zdania.
Conclusions: Potwierdzono równie małą wiedzę w temacie dyspareunii i fizjoterapii uroginekologicznej wśród kobiet z dyspareunią i bez dyspareunii oraz rzadkie korzystanie z fizjoterapii przez kobiety z dyspareunią. Stwierdzono zależność między poziomem bólu a poszukiwaniem pomocy medycznej.
Key words: dyspareunia, fizjoterapia, uroginekologia, funkcjonowanie seksualne.

Wpływ rozciągania statycznego i poizometrycznej relaksacji na zakres ruchomości, siłę chwytu i dolegliwości bólowe w obrębie ręki u osób wykonujących pracę biurową

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Introduction: Powtarzalność czynności roboczych i stała, wymuszona pozycja ciała są głównymi czynnikami powodującymi zespoły przeciążeniowe układu mięśniowo-szkieletowego, które charakteryzują zawodową pracę biurową. Dolegliwości w obrębie ręki, obok bólu kręgosłupa, należą do najczęściej stwierdzanych zespołów przeciążeniowych. Objawy występujące w obrębie ręki w związku z wykonywaną pracą to ból, sztywność oraz uczucie zimna, drętwienia i mrowienia.
Aim of the study: Celem pracy była ocena wpływu i różnic między technikami rozciągania statycznego i poizometrycznej relaksacji na zakres ruchomości, siłę chwytu i dolegliwości bólowe w obrębie ręki u osób wykonujących pracę biurową.
Material and methods: Badania przeprowadzono w grupie 40 osób w wieku 25–40 lat. Metodą losową zostali podzieleni na dwie grupy. Zadaniem obu grup było codzienne rozciąganie zginaczy i prostowników nadgarstka przez okres dwóch tygodni – w pierwszej grupie wykonując rozciąganie statyczne, a w drugiej wykorzystując poizometryczną relaksację. Do realizacji założonego celu badawczego posłużono się metodą sondażu diagnostycznego z wykorzystaniem autorskiej ankiety. Wykonano również pomiary zakresów ruchomości i obwodów oraz zmierzono siłę chwytu cylindrycznego i szczypcowego za pomocą dynamometru.
Results: Wykazano istotne statystycznie (p < 0,05) zmiany w zakresie ruchomości i pomiarach obwodowych w obu grupach oraz w sile chwytu w grupie wykonującej poizometryczną relaksację.
Conclusions: 1. W obu grupach uzyskano poprawę ruchomości zgięcia i wyprostu. 2. W grupie wykonującej poizometryczną relaksację odnotowano większy wzrost siły. 3. Wśród wszystkich badanych uzyskano spadek dolegliwości bólowych.
Key words: poizometryczna relaksacja, PIR, stretching.

Wpływ sztywności pasywnej mięśnia prostego uda na zakres ruchomości stawu kolanowego u pacjentów po uszkodzeniu więzadła krzyżowego przedniego

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Introduction: Wśród pacjentów po uszkodzeniu więzadła krzyżowego przedniego (ACL) często mamy do czynienia z ograniczeniem zakresu ruchomości (ROM) stawu kolanowego. Ograniczenie ROM często może być spowodowane pourazowym obrzękiem, przykurczem tkanek miękkich okalających staw kolanowy i dół podkolanowy. Sztywność pasywna mięśnia prostego uda nie jest w literaturze dobrze opisana. Niektórzy autorzy uważają, że sztywność pasywna może powodować zmniejszenie translacji przedniej. Natomiast niektórzy klinicyści uważają, że zwiększona sztywność mięśniową może wpłynąć na deficyt ROM stawu kolanowego.
Aim of the study: W tej pracy chcielibyśmy wykazać związek pomiędzy sztywnością pasywną mięśnia prostego uda a ROM stawu kolanowego po uszkodzeniu ACL.
Material and methods: Badanie przeprowadzono na grupie 46 pacjentów w przedziale wiekowym 18–46 lat (± SD) z uszkodzonym ACL (leczonych nieoperacyjnie). Diagnostyka obejmowała lekarskie badanie fizykalne i została potwierdzona w obrazach MRI. Sztywność pasywna mięśnia prostego uda została zbadana w teście *prone knee bend test*, a ROM został przeprowadzony w formie pasywnej. Do obu z tych badań został użyty inklinometr Saundersa.
Results: Zwiększona sztywność prostego uda koreluje zarówno z deficytem wyprostu, jak i zgięcia stawu kolanowego po uszkodzeniu ACL.
Conclusions: U pacjentów po uszkodzeniu ACL i z ograniczonym ROM warto zwrócić uwagę na sztywność mięśniową i normalizację długości funkcjonalnej tych mięśni.
Key words: uszkodzenie ACL, sztywność pasywna, prosty uda, zakres ruchu.

Znaczenie postępowania fizjoterapeutycznego w dystrofii mięśniowej Duchenne'a

Sylwia Staciwa

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Introduction: Dystrofia mięśniowa Duchenne'a jest chorobą sprzężoną z chromosomem X, spowodowaną zmianami genu dystrofiny. Brak białka powoduje martwicę włókien mięśniowych. Następstwem jest rozległe wyniszczenie, osłabienie i utrata funkcji mięśni, co prowadzi do śmierci na skutek niewydolności krążeniowo-oddechowej. Fizjoterapia jest niezbędna w celu spowolnienia rozwoju choroby.
Aim of the study: Celem jest przedstawienie wyników oceny fizjoterapeutycznej oraz zwrócenie uwagi na istotę prowadzenia postępowania fizjoterapeutycznego u pacjenta z chorobą Duchenne'a.
Material and methods: Pacjent, 15 lat, z dystrofią mięśniową Duchenne'a zdiagnozowaną w 3. roku życia (mutacja spontaniczna, delecja eksonów 11–17). Choroby współistniejące: osteoporoza oraz posteroidowa otyłość (BMI 34,7). Pacjent do 6. r.ż. pod opieką Ośrodka Wczesnej Interwencji, od 2011 r. rehabilitacja prowadzona w trybie domowym. W 2010 r. włączono Symulator Jazdy Konnej 15 min/dobę. Od początku diagnozy jest pod opieką logopedy 2 razy w tygodniu. Pacjent został przyjęty do Centrum Chorób Rzadkich UCK. Podczas konsultacji rehabilitacyjnej wykonano ocenę postawy ciała, ROM, 6MWT, badania funkcjonalne kkd i kkg. Wszystkie wyniki nieadekwatnie dobre, mimo rozległej delecji.
Results: Postawa ciała wg Kasperczyka oceniona na 12 pkt. W 6MWT 162 m. W skali Brooka 2, Vignos 2. Pacjent w PUL 2.0 uzyskał 38 pkt. W badaniu NSAA 6 pkt. Bieg na 10 m w czasie 13,21 s. W badaniu ROM ograniczenie odwiedzenia i rotacji wewnętrznej w stawach barkowych oraz zgięcia stawów łokciowych. W kdL ograniczenie wyprostu w stawie biodrowym oraz silne przeprosty w obu stawach kolanowych (P i L – 18°). W stawach skokowych trwały deficyt wyprostu. Pacjent porusza się samodzielnie, a wózek inwalidzki używa przy dłuższych dystansach.
Conclusions: Wczesna diagnoza jest znacząca dla pacjentów z DMD, a intensywna, prawidłowo prowadzona rehabilitacja znacząco wpływa na ich stan funkcjonalny, rzutując na polepszenie samopoczucia oraz codziennego funkcjonowania.
Key words: fizjoterapia, DMD, dystrofia mięśniowa Duchenne'a.

Porównanie wpływu masażu klasycznego i ćwiczeń w wodzie na stan funkcjonalny i subiektywne dolegliwości bólowe dolnego odcinka kręgosłupa u kobiet w ciąży

Comparison of the classic massage effects and water exercises upon functioning state and subjective pain ailment of lumbar spine among pregnant women

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Introduction: Ciąża jest szczególnym okresem w życiu każdej kobiety. W organizmie przyszłej mamy zachodzi wiele zmian, którym towarzyszą dolegliwości typowe dla okresu ciąży, tj. nudności, obrzęki lub bóle dolnego odcinka kręgosłupa. Dolegliwości bólowe odcinka lędźwiowo-krzyżowego kręgosłupa mają złożoną etiologię, a możliwości ich leczenia są ograniczone. Najczęściej ciężarne korzystają z zabiegów masażu klasycznego, akupunktury, hydroterapii i kinezyterapii.

Aim of the study: Porównanie działania masażu klasycznego i ćwiczeń w wodzie na stan funkcjonalny ciężarnych z dolegliwościami bólowymi dolnego odcinka kręgosłupa.
Material and methods: Grupę badaną stanowiło 40 kobiet w II i III trymestrze ciąży z bólami kręgosłupa lędźwiowego. Respondentki podzielono na 2 grupy; pierwsza grupa korzystała z masażu klasycznego, a druga – brała udział w ćwiczeniach w wodzie. Ocenie poddano ruchomość kręgosłupa lędźwiowego, stopień dolegliwości bólowych oraz stan funkcjonalny badanych. Wykorzystano: pomiar goniometryczny ruchomości kręgosłupa lędźwiowego w płaszczyźnie strzałkowej, skalę bólu wizualno-analogową (VAS) oraz autorski kwestionariusz ankietowy.
Results: Po zakończeniu zabiegów w obu grupach zaobserwowano zmniejszenie dolegliwości bólowych kręgosłupa oraz zwiększenie jego ruchomości. Lepszy efekt przeciwbólowy uzyskano w grupie kobiet, które brały udział w ćwiczeniach w wodzie. Zarówno masaż klasyczny, jak i ćwiczenia w wodzie poprawiły sprawność funkcjonalną badanych kobiet w porównywalnym stopniu.
Conclusions: Masaż klasyczny i ćwiczenia w wodzie są bezpiecznymi terapiami polecanymi kobietom w ciąży, które odczuwają dolegliwości bólowe dolnego odcinka kręgosłupa.
Key words: ciąża, dolegliwości bólowe dolnego odcinka kręgosłupa, leczenie, masaż klasyczny, ćwiczenia w wodzie.

Wpływ mięśniowo-powięziowych punktów spustowych mięśnia czworobocznego na wartości spoczynkowej aktywności bioelektrycznej mięśni narządu żucia

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Introduction: Współwystępowanie dolegliwości bólowych mięśni szyjnego odcinka kręgosłupa z dolegliwościami bólowymi w układzie mięśniowym narządu żucia zostało wykazane w licznych pracach badawczych, jednakże mechanizmy te nie zostały dotychczas jednoznacznie wyjaśnione. Jedną z możliwych przyczyn tej zależności jest mechanizm bólu przeniesionego w obrębie mięśni narządu żucia z mięśniowo-powięziowych punktów spustowych (MPPS) mięśni szyjnego odcinka kręgosłupa. Dlatego też szczegółowe poznanie mechanizmów powstawania bólu przeniesionego w tej okolicy może być niezwykle istotne w zrozumieniu etiologii i przebiegu takich schorzeń, jak dolegliwości bólowe mięśni narządu żucia, i zaburzeń czynnościowych układu ruchowego narządu żucia (ZCURNŻ).
Aim of the study: Określenie wpływu mięśniowo-powięziowych punktów spustowych mięśnia czworobocznego na wartości spoczynkowej aktywności bioelektrycznej mięśni narządu żucia oraz wskaźników aktywności maksymalnego dowolnego skurczu (MCV) oraz wskaźników aktywności i asymetrii POC, ACT, ASY, TC.
Material and methods: Na podstawie kryteriów diagnostycznych MPPS wg Travell & Simons i Badawczych Kryteriów Diagnostycznych Zaburzeń Czynnościowych Układu Ruchowego Narządu Żucia BKD/ZCURNŻ do badania zakwalifikowano 167 osób (wiek 26 ± 8 lat), które które zostały podzielone na 3 grupy: 1 – grupa kontrolna, 2 – grupa z obecnymi aktywnymi MPPS w obrębie mięśnia czworobocznego bez ZCURNŻ oraz 3 – grupa ze zdiagnozowanymi ZCURNŻ bez obecności MPPS w obrębie mięśnia czworobocznego. Pomiar spoczynkowej aktywność przednich części mięśni skroniowych (TA) i powierzchownych części mięśni żwaczy (MM) przeprowadzono z wykorzystaniem elektromiografu BioEMG III™ BioResearch Associates, Inc. (Milwaukee, WI, USA), na podstawie której określono wartości wskaźników MCV, POC, AsI, AcI oraz TC. Do analizy statystycznej zastosowano test W Shapiro-Wilka i test Kruskala-Wallisa. Próg istotności ustalono na poziomie $p < 0,05$.
Results: Wartości MVC były wyższe w grupie 2. w stosunku do po pozostałych grup. Wartości POC różniły się istotnie w grupie 3. Najmniejszą asymetrię wykazywała grupa 3. Najniższe wartości TC wykazywała grupa 2. Wszystkie wyniki były istotne statystycznie – $p < 0,05$. Nie zaobserwowano istotnego związku pomiędzy MPPS a wartościami AsI i AcI.
Conclusions: MPPS mięśnia czworobocznego mają związek ze zwiększoną aktywnością spoczynkową w obrębie TA i MM, lecz nie są związane z asymetrią w obrębie tych mięśni.
Key words: sEMG, ZCURNŻ, MCV, mięsień czworoboczny.

Czy grupa zawodników futsalu, która doznała urazu skrętnego stawu kolanowego, miała wyjściowo zwiększenie sztywności mięśni kulszowo-goleniowych?

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Introduction: Sztywność mięśniowa to wzrastające napięcie mięśni, które nasila się wraz ze zwiększeniem zakresu ruchu w stawie, ograniczając jego mobilność. Odpowiednie wartości tego zjawiska stanowią parametr, który w istotny sposób może wpływać na prawdopodobieństwo wystąpienia kontuzji. Zatem wśród osób regularnie uprawiających sport może rodzić się problem, czy jest to cecha, która oddziałuje w sposób negatywny czy też pozytywny na możliwość wystąpienia kontuzji. Niniejsze opracowanie stanowi próbę odpowiedzi na pytanie, czy sztywność mięśniowa wpływa na powstawanie urazów skrętnych stawu kolanowego i czy może stanowić ich prewencję wśród zawodników profesjonalnie uprawiających futsal.
Aim of the study: Głównym celem badań było określenie, czy grupa zawodników, która doznała urazu skrętnego stawu kolanowego, miała wyjściowo zwiększoną sztywność mięśni kulszowo-goleniowych w stosunku do grupy zawodników, która nie miała urazu skrętnego stawu kolanowego.
Material and methods: Badaniem została objęta grupa 44 zawodników futsalu (17 do 37 lat) na poziomie Ekstraklasy

Polskiej. Mięśnie kulszowo-goleniowe były badane przy użyciu zmodyfikowanego testu *Passive Knee Extension in the Supine* (PKES), a zawodnicy obserwowani przez okres jednego roku (sezon) po zakończeniu tych badań. Każdy uraz skrętny stawu kolanowego został opisany w karcie pacjenta. Badani zostali podzieleni na 2 grupy: pierwsza to zawodnicy, którzy doznali urazu skrętnego stawu kolanowego, druga grupa to zawodnicy, którzy nie doznali urazu skrętnego stawu kolanowego. Do określenia różnic statystycznych wybrano analizę wariancji jednoczynnikowej (ANOVA) przy użyciu testu post-hoc Fishera na poziomie istotności 5%.
Results: Analiza statystyczna wykazała istotną statystycznie zależność między wartościami sztywności mięśni kulszowo-goleniowych a występowaniem urazów wśród zawodników futsalu. Grupa zawodników, która doznała urazu stawu kolanowego, charakteryzowała się wyjściowo mniejszą sztywnością w porównaniu z grupą, która nie doznała kontuzji.
Conclusions: Niniejsze badanie pokazuje, że zwiększona sztywność mięśniowa, która w większości przypadków uznawana jest za cechę negatywną występującą u sportowców, może okazać się czynnikiem, który stanowi prewencję zawodników przed doznaniem urazów stawu kolanowego. Badani cechujący się mniejszą sztywnością częściej doznają kontuzji stawu kolanowego w porównaniu z osobami ze zwiększoną sztywnością mięśni kulszowo-goleniowych.
Key words: sztywność mięśniowa, mięśnie kulszowo-goleniowe, uraz stawu kolanowego, kontuzja, prewencja.

Epidemiologia dolegliwości bólowych kręgosłupa wśród kobiet po 18. roku życia

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Introduction: Dolegliwości bólowe kręgosłupa dotykają od 4,7% do 74,4% populacji światowej, podczas gdy ból przewlekły dotyczy ok. 40% populacji dorosłych. Obecna literatura przedmiotu nie daje jednoznacznych danych statystycznych na temat rozpowszechnienia bólu w poszczególnych odcinkach kręgosłupa. Czynnikami ryzyka tych dolegliwości są m.in. płeć żeńska oraz czynniki psychologiczne.
Aim of the study: Celem badania było określenie rozpowszechnienia dolegliwości bólowych kręgosłupa w poszczególnych odcinkach oraz ocena składowych psychometrycznych wśród kobiet po 18. roku życia.
Material and methods: Do badania zgłosiły się 422 kobiety zamieszkujące województwo lubelskie oraz mazowieckie. Po zastosowaniu kryteriów wyłączających do badania zakwalifikowano 368 kobiet w wieku 23 lat ± 3 lata. Badanie przeprowadzono autorskim kwestionariuszem bazującym na skali VAS, dodatkowo do badania włączono kwestionariusze PHQ-9 i GAD-7. Opracowanie statystyczne wykonano z zastosowaniem programu IBM SPSS STATISTICS 21. Przeprowadzono analizę korelacji testem *r*-Pearsona. Różnice były rozpatrywane jako istotne statystycznie, jeśli poziom prawdopodobieństwa testowego był niższy niż założony poziom istotności ($p < 0.01$).
Results: 58% respondentek zgłaszało dolegliwości bólowe w odcinku lędźwiowym, 44% w odcinku krzyżowym, 43% w odcinku szyjnym, a 32% w odcinku piersiowym. 12% respondentek doświadczyło bólu w 3 regionach kręgosłupa, podczas gdy 31% respondentek doświadczyło bólów we wszystkich odcinkach kręgosłupa. Zaobserwowano niższe wyniki kwestionariusza PHQ-9 i wyższe GAD-7 u respondentek z dolegliwościami odcinka lędźwiowego w porównaniu z pozostałymi odcinkami kręgosłupa, jednak wyniki nie były istotne statystycznie ($p > 0,05$).
Conclusions: Dolegliwości bólowe w badanej grupie najczęściej dotyczą odcinka lędźwiowego kręgosłupa (58% respondentek). Prawie 1/3 respondentek zgłasza dolegliwości bólowe we wszystkich odcinkach kręgosłupa. W grupie badanej bóle kręgosłupa nie były skorelowane z poziomem depresji i lęku uogólnionego.
Key words: back pain, women, public health, epidemiology.

Wpływ stażu sportowego, ilości i czasu treningu w tygodniu na występowanie kontuzji we wspinaczce sportowej

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Introduction: Wspinaczka sportowa jest znaną od wielu lat formą aktywności fizycznej. Staje się ona coraz bardziej popularną dyscypliną sportową, zarówno wśród amatorów, jak i sportowców zawodowych. Rosnące zainteresowanie wspinaczką zaowocowało jej włączeniem do programu Igrzysk Olimpijskich w Tokio w 2020 r. Coraz większa liczba amatorów wspinaczki oraz stale zwiększający się poziom elity światowej powoduje wzrost liczby urazów zgłaszanych do gabinetów lekarskich i fizjoterapeutycznych. W związku z tym wspinaczka sportowa stała się obiektem zainteresowania badaczy z zakresu medycyny sportowej i fizjoterapii.
Aim of the study: Określenie, czy staż wspinaczkowy, ilość i czas treningu w okresie tygodnia będą wpływały na występowanie kontuzji we wspinaczce sportowej.
Material and methods: Do badania zgłosiło się 108 osób, które wypełniły autorski kwestionariusz dotyczący doświadczenia sportowego, zwyczajów treningowych i dróg pokonanych w ciągu ostatnich 6 miesięcy. Ze względu na kryteria wyłączające do dalszej analizy zakwalifikowano 104 osoby. Na podstawie kwestionariusza dokonano podziału na grupę badaną – osoby, u których stwierdzono urazy w ciągu ostatnich 6 miesięcy, oraz kontrolną – osoby bez urazów. Urazy były oceniane na podstawie skali Komisji Medycznej UIAA dla sportów górskich i wspinaczkowych (The UIAA Medical Commission Injury Classification for Mountaineering and Climbing Sports). Do analizy statystycznej zastosowano test *W* Shapiro-Wilka oraz test *U* Manna-Whitneya. Różnice były rozpatrywane jako istotne statystycznie, jeśli poziom praw-

dopodobieństwa testowego był niższy niż założony poziom istotności ($p < 0.05$).
Results: Obie grupy miały podobny staż wspinaczkowy, trenowały średnio 2 razy na tydzień przy średniej długości treningów 2 godzin na trening. Grupa badana rozgrzewała się o 2 minuty krócej niż grupa kontrolna. Wyniki nie były istotne statystycznie.
Conclusions: 1. W grupie zakwalifikowanej do badania staż wspinaczkowy, ilości i czas treningu w okresie tygodnia nie wpływały na występowanie kontuzji we wspinaczce sportowej. 2. Największa liczba urazów dotyczyła kończyny górnej, w szczególności palców rąk.
Key words: wspinaczka sportowa, medycyna sportowa, kontuzje.

Ocena skuteczności terapii mięśniowo-powięziowych punktów spustowych u pacjentów z formą mięśniową ZCURNŻ – badania pilotażowe

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Introduction: Zaburzenia czynnościowe układu ruchowego narządu żucia (ZCURNŻ) są uznawane przez Światową Organizację Zdrowia za trzecią najczęstszą chorobę stomatologiczną po próchnicy i zapaleniu ozębnej. Badania przeprowadzone przez *National Institute of Dental and Craniofacial Research* podają, że ZCURNŻ dotyka od 5 do 12% populacji, z czego znacznie bardziej narażoną grupą są kobiety. ZCURNŻ stanowią zaburzenia dotykające zarówno mięśni narządu żucia, jak i struktur kostnych stawów skroniowo-żuchwowych oraz tkanek i struktur powiązanych z tym obszarem. U pacjentów z mięśniową formą ZCUNRŻ obserwuje się obecność mięśniowo-powięziowych punktów spustowych (MPPS) w mięśniach narządu żucia. Obecnie uznaje się, że MPPS są jedną ze składowych patofizjologii zaburzeń skroniowo-żuchwowych.
Aim of the study: Ocena skuteczności terapii mięśniowo-powięziowych punktów spustowych u pacjentów z mięśniową formą ZCURNŻ.
Material and methods: Do badania pilotażowego zgłosiło się 10 kobiet w wieku 31 lat ze zdiagnozowaną formą mięśniową zaburzeń czynnościowych układu ruchowego narządu żucia. Za pomocą elektromiografu BioEMG III zbadano aktywność mięśni skroniowych i żwaczy, w stanie spoczynku i zwarcia. MPPS został zdiagnozowany na podstawie kryteriów Travell & Simons. Następnie przeprowadzono terapię mięśniowo-powięziowego punktu spustowego (MPPS) mięśnia żwacza. Następnie powtórzono badanie elektromiograficzne. Do analizy statystycznej zastosowano test *U* Manna-Whitneya. Próg istotności ustalono na poziomie 5%.
Results: Pacjenci po terapii MPPS wykazywali większe napięcie bioelektryczne w stanie spoczynku oraz w maksymalnym zwarciu. Zaobserwowane zwiększenie maksymalnego bezbólowego czynnego otwarcia o 1 mm, jednak zaobserwowane wyniki nie były istotne statystycznie $p > 0,05$.
Conclusions: W badanej grupie terapia MPPS zwiększyła napięcie bioelektryczne mięśni i zakres bezbólowego czynnego otwarcia. Sugeruje się rozszerzenie badań na większą grupę badanych.
Key words: ZCURNŻ, mięśniowo-powięziowe punkty spustowe, żwacz, skroniowy, sEMG.

Jaki związek z rozwojem i rehabilitacją mają bezkręgowce, czyli o znaczeniu neurobiologii w fizjoterapii

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Introduction: Neurobiologia łączy elementy nauk przyrodniczych, medycznych oraz humanistycznych. Wszelkie funkcje kognitywne i motoryczne mają swoje podłoże w procesach molekularnych. Również ruch oraz uczenie się indukują zaistnienie pewnych procesów w naszych komórkach. Neurobiologia jest nauką, która ostatnimi czasy bardzo dobrze się rozwija i pozwala lepiej zrozumieć procesy zachodzące w układzie nerwowym, który wciąż pozostaje zagadką dla badaczy. Krewetki, kałamarnice, ślimaki czy owady to organizmy, dzięki którym można lepiej zrozumieć procesy zachodzące w układzie nerwowym, szczególnie w kontekście rehabilitacji neurologicznej.
Aim of the study: W fizjoterapii często stosuje się takie pojęcia, jak neuroplastyczność czy choroby neurodegeneracyjne, ale bez zrozumienia, jaki jest mechanizm danego zjawiska. Dzięki owadzim modelom neurobiologicznym można lepiej zrozumieć procesy neurodegeneracji, a także poznać mechanizm stojący za powstawaniem śladu pamięciowego. Najnowsze odkrycia neurogenetyczne pozwalają zaś na przewidywanie skutków usprawniania ruchowego, co może być wykorzystane w programowaniu rehabilitacji.
Material and methods: Praca opiera się głównie na przeglądzie literatury oraz na obserwacjach dokonanych przez autora w pracowni neurobiologii, pracowni neurofizjologii oraz w laboratorium biologicznym. Autor wykorzystuje wiedzę praktyczną zdobytą podczas doświadczeń laboratoryjnych na chrząszczach oraz badań neurofizjologicznych.
Results: Z przeanalizowanej literatury oraz doświadczenia autora wynika, że zrozumienie mechanizmów takich jak plastyczność neuronalna, jest kluczowe w skutecznym oddziaływaniu terapeutycznym. Neurogenetyka zaś rzuca nowe światło na programowanie rehabilitacji, gdyż pozwala przewidzieć niektóre efekty terapeutyczne.
Conclusions: Bezkręgowce są ważnym elementem neurobiologii, która z kolei jest podstawą zrozumienia procesów neurologicznych. Dzięki doświadczeniom na bezkręgowcach możliwe jest zrozumienie procesów motorycznego uczenia się, które jest podstawą usprawniania ruchowego. Neurobiologia jest nauką nie tylko pozwalającą na zrozumienie

procesów, ale również na przewidywanie skutków fizjoterapii.
Key words: fizjoterapia neurologiczna, neurobiologia, neuroscience, bezkręgowce, neurogenetyka.

Profilaktyka uszkodzeń narządu ruchu wśród bramkarzy piłki nożnej – przegląd literatury

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Introduction: Specyfika gry bramkarzy jest znacząco odmienna od gry zawodników z pola, a badania potwierdzają, że bramkarze doznają 4,6 razy częściej uszkodzeń kończyn górnych niż zawodnicy z pola. O ile profilaktyka urazów sportowych wśród zawodników z pola jest analizowana od 2004 r., o tyle brakuje prac dotyczących bramkarzy.
Aim of the study: Celem pracy jest przegląd prac naukowych dotyczących profilaktyki uszkodzeń narządu ruchu wśród bramkarzy piłki nożnej.
Material and methods: W lutym 2020 r. wykonano systematyczny przegląd bazy PubMed, wykorzystując iloczyn logiczny słów kluczowych (goalkeep* OR goal-* OR GK) AND (soccer OR football) AND prevent*.
Results: W wyniku wyszukiwania uzyskano 109 prac; przeanalizowano ich streszczenia. Usuwając duplikaty prac oraz prace dotyczące innych aspektów niż profilaktyka uszkodzeń narządu ruchu, pozostały jedynie dwa artykuły. W pierwszym opisano sposób opracowania programu dedykowanego bramkarzom, z uwzględnieniem wykorzystania ćwiczeń specyficznych dla kompleksu barkowego. Drugi artykuł zawiera retrospektywną analizę ankiet charakteryzujących uszkodzenia bioder w wyniku rzutów bramkarskich wraz z biomechaniczną analizą odkształcenia stosowanych spodenek bramkarskich jako elementu stroju profilaktycznego. Niestety nie znaleziono prac o wysokiej jakości naukowej oceniających skuteczność strategii profilaktycznych wśród bramkarzy, w których wyniki byłyby przedstawiane za pomocą względnych lub bezwzględnych parametrów, np. współczynnika urazowości. Ograniczeniem niniejszego przeglądu jest przeszukanie tylko jednej bazy oraz analiza prac jedynie w języku angielskim.
Conclusions: Potrzeba większej liczby badań opisujących zastosowanie i oceniających skuteczność strategii profilaktycznych wśród bramkarzy piłki nożnej.
Key words: uszkodzenia, profilaktyka, bramkarz.

Wpływ strony dominującej u zawodników badmintona na zakres ruchomości odcinka szyjnego i piersiowo-lędźwiowego kręgosłupa oraz obciążanie kończyn – badanie pilotażowe

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Introduction: Specyfika gry w badmintona może prowadzić do dysfunkcji po stronie dominującej, co jest związane z asymetrią ruchów. Powtarzające się ruchy rotacyjne mogą prowadzić do dysfunkcji oraz zmian w zakresach ruchomości odcinka szyjnego i piersiowo-lędźwiowego kręgosłupa oraz obciążaniu kończyn dolnych.
Aim of the study: Celem badania była ocena ograniczeń ruchomości na przykładzie zakresów ruchu (ROM) w odcinku szyjnym oraz piersiowo-lędźwiowym kręgosłupa oraz rozkładu obciążania kończyn dolnych i ich asymetrii u osób trenujących badmintona. Pytania badawcze: 1. Jaki jest zakres ruchomości w odcinku szyjnym i piersiowo-lędźwiowym kręgosłupa u badmintonistów i czy zmiany występują symetrycznie? 2. W jakim stopniu strona dominująca wpływa na obciążanie kończyn dolnych? 3. Jakie są asymetrie w obwodach kończyn górnych i kończyn dolnych?
Material and methods: Badaniem objęto 17 zawodników – 3 kobiety i 14 mężczyzn – w wieku od 18. do 65. r.ż. Przeprowadzono badanie zakresów ruchów i obwodów ramion i ud. Pomiarów dokonano za pomocą metra zgodnie z wytycznymi pomiarów oraz zakresów ruchu (ROM), porównano je z normami wiekowymi. Do oceny rozkładu ciężaru ciała zastosowano test dwóch wag.
Results: Stwierdzono ograniczenia w odcinku szyjnym (procent badanych): wyprostu w tył: 70,58%; zgięcia w bok: obustronnie 58,82%, tylko po stronie dominującej 5,88%, w 64,70% większe ograniczenie po stronie dominującej; skrętu: obustronnie 29,41%, po stronie dominującej 29,41%, niedominującej 11,76%; w odcinku piersiowo-lędźwiowym; zgięcie boczne: obustronnie 52,94%, dominująca 11,76, niedominująca 23,52%; skręt obustronnie: 58,82%, tylko po stronie niedominującej 5,88%. Ponadto odnotowano przewagę obciążenia po stronie dominującej u 82,35%. Różnica w obciążaniu: 5,29 kg. Asymetria obwodów: ramię dominujące większe o 1,23 cm, udo dominujące większe o 1,98 cm.
Conclusions: 1. Ograniczenie ruchomości występuje głównie po stronie dominującej. Przeważa ograniczenie w wyproście w tył w odcinku szyjnym i bok w szyjnym i piersiowo-lędźwiowym. 2. Wszyscy badani obciążali bardziej stronę dominującą. 3. Występowały asymetrie obwodów kg i kd po stronie dominującej.
Key words: badminton, ograniczenie ruchomości kręgosłupa, strona dominująca, test dwóch wag, asymetria.

Rodzaje i częstość występowania urazów sportowych u zawodników badmintona

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Introduction: Badminton to sport wytrzymałościowo-szybkościowy. Większość urazów dotyczy części dystalnych kończyn dolnych. Uszkodzenia kończyny górnej u badmintonistów są rzadsze. Istotną kwestią wydaje się również towarzyszący zawodnikom badmintona przewlekły ból odcinka lędźwiowego kręgosłupa.
Aim of the study: Określenie najczęstszych rodzajów urazów u badmintonistów. Ocena przyczyny i charakterystyka bólu lędźwiowego odcinka kręgosłupa u graczy w badmintona.
Material and methods: Wypełnienie autorskiej ankiety na temat przebytych urazów związanych z badmintonem. Kryteria włączenia spełniło 40 osób z 47 ankietowanych (N = 40). Grupą badaną byli zawodnicy sekcji badmintona AZS AGH i PK w Krakowie oraz STB Lubliniec. Wiek: 19–55 lat (x = 30,38). Ankietę wypełniło 31 mężczyzn i 16 kobiet. Kryteria włączenia: uprawianie badmintona przez okres minimum 3 lat; osoby pełnoletnie w wieku 18–65 lat; zgoda na udział w badaniu. Kryteria wyłączenia: uprawianie badmintona poniżej 3 lat; wiek poniżej 18 lat i powyżej 65 lat; uprawianie innych sportów spoza sportów rakietowych więcej niż 3 razy w tygodniu; brak zgody na udział w badaniu.
Results: Urazu stawu skokowego doznało 50% ankietowanych, ścięgna Achillesa 33,3%, natomiast zapalenie rozcięgna podeszwowego i urazy stopy stanowiły 23,3%. Urazy kończyny górnej dotyczyły 36,7% zawodników. Bóle lędźwiowego odcinka kręgosłupa odczuwało 76,1% ankietowanych. Średnia wieku x = 33,1 r.ż. i grający średnio x = 17 lat. Zawodnicy powyżej 39. r.ż., którzy często odczuwali przewlekły ból lędźwiowego odcinka kręgosłupa, stanowili 55,6% i grali w badmintona średnio x = 29,5 roku. Po zakończeniu rehabilitacji 41,4% ankietowanych odczuwało powysiłkowe dolegliwości bólowe w miejscu urazu, 13,8% spoczynkowy ból w kontuzjowanym miejscu, 20,7% powysiłkowy obrzęk w miejscu urazu.
Conclusions: Najczęstszymi rodzajami urazów wśród badmintonistów są skręcenia stawu skokowo-goleniowego, zapalenia rozcięgna podeszwowego oraz przeciążenia ścięgna Achillesa. Ból w odcinku lędźwiowym kręgosłupa był wynikiem mikrourazów spowodowanych powtarzającymi się ruchami skrętnymi tułowia w czasie gry charakterystycznymi dla dyscypliny sportowej, jaką jest badminton.
Key words: badminton, urazy.

Nietrzymanie moczu jako jedna z konsekwencji osłabienia mięśni dna miednicy u kobiet chorujących na bulimię

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Introduction: Zaburzenia odżywania to jeden z coraz częstszych problemów XXI w. *Bulimia nervosa* to przykład choroby, w której występuje nadmierne, obsesyjne koncentrowanie się na swoim wyglądzie oraz masie ciała. Powtarzające się napady objadania oraz następujące po nich kompensacyjne zachowania, takie jak prowokowanie wymiotów, nadużywanie środków przeczyszczających oraz moczopędnych, głodówki i diety, są charakterystyczne dla tej jednostki chorobowej. Bulimia powoduje wiele niekorzystnych skutków zdrowotnych. Podczas wymiotów dochodzi do zwiększenia ciśnienia w jamie brzusznej, które jest spowodowane napięciem i skurczami tłoczni brzusznej. Wzrost ciśnienia śródbrzusznego ma wpływ na funkcjonowanie mięśni dna miednicy. Natomiast ich osłabienie ma związek z nietrzymaniem moczu.
Aim of the study: Celem pracy było zbadanie zależności pomiędzy występowaniem epizodów bulimicznych u kobiet chorujących na bulimię a osłabieniem mięśni dna miednicy, objawiającym się jako występowanie incydentów nietrzymania moczu.
Material and methods: Badaniem ankietowym objęto 50 kobiet chorujących na bulimię w wieku od 16 do 44 lat (średnia wyniosła 25,96 roku, a odchylenie standardowe 7,099). Ankieta została rozpowszechniona na stronach internetowych dla kobiet zmagających się z bulimią i składała się z 39 pytań. Pytania dotyczyły podstawowych danych osoby badanej, takich jak wiek, wykształcenie, miejsce zamieszkania, a także przebiegu choroby i występowania incydentów nietrzymania moczu.
Results: W toku przeprowadzonego badania zaobserwowano zależność między zachorowaniem na bulimię a pojawieniem się epizodów nietrzymania moczu. W badaniu wykazano, że najczęściej występującym incydentem, charakterystycznym dla bulimii były wymioty – aż 94% ankietowanych wskazało na ten rodzaj kompensacji (w tym 57% przyznało się do wymiotowania kilka razy dziennie). Wśród przebadanych kobiet utrzymuje się tendencja do występowania epizodów nietrzymania moczu podczas wykonywania różnych czynności życiowych – wzrost z 14% przed zachorowaniem do 74% obecnie. U kobiet, które przyznały się do gubienia moczu, owe incydenty pojawiały się podczas kaszlu, kichania, śmiechu – 67%, a także podczas incydentów wymiotnych – 49%. Znaczna większość ankietowanych kobiet – 86%, nie doświadczyła podobnych objawów przed zachorowaniem na bulimię. Kobiety biorące udział w badaniu, u których pojawiły się incydenty inkontynencji, w większości nie konsultowały problemu nietrzymania moczu ze specjalistą – 89%. Spośród nich tylko 9% ma w planach skonsultowanie problemu gubienia moczu ze specjalistą.
Conclusions: Zachowania kompensacyjne stosowane przez kobiety chorujące na bulimię, w szczególności zachowania wymiotne, mają wpływ na pojawienie się incydentów nietrzymania moczu. Prowadzą do wzrostu ciśnienia w jamie brzusznej, tym samym wpływając na wzrost tłoczni brzusz-

nej. W wyniku licznych epizodów wymiotnych dochodzi do osłabienia mięśni dna miednicy, skutkiem czego jest nietrzymanie moczu. Z przeprowadzonego badania wynika, że kobiety nie mają świadomości problemu i w większości nie chcą szukać pomocy, dlatego bardzo istotna jest odpowiednia edukacja w tym właśnie zakresie.

Key words: bulimia, nietrzymanie moczu, mięśnie dna miednicy, inkontynencja, zaburzenia odżywiania.

Badanie rozkładu nacisku podeszwowego stóp w postawie stojącej w porównaniu z pozycją przyjętą do serwisu u dzieci trenujących tenis stołowy. Doniesienie wstępne

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Introduction: Tenis stołowy jest sportem, w którym istotne znaczenie ma fakt, której kończyny górnej i dolnej używa zawodnik. Znajduje się on w grupie sportów asymetrycznych, która może mieć wpływ na postawę i rozkład nacisku podeszwowego stóp. Te aspekty mogą znacząco wpływać na jakość i skuteczność gry zawodnika. W tej dyscyplinie poziom przygotowania technicznego, przygotowanie fizyczne i aspekty psychiczne mają bardzo istotne znaczenie w osiąganiu sukcesów.
Aim of the study: Celem badań była ocena wpływu regularnego treningu tenisa stołowego na rozkład nacisku podeszwowego u dzieci w wieku od 8 do 14 lat, zbadanego podczas przyjęcia przez zawodnika dwóch różnych pozycji. Badania mają również na celu udoskonalenie treningu tenisa stołowego poprzez ocenę wyżej wymienionego aspektu.
Material and methods: Badaniem objęto czternaścioro dzieci (N = 14), które regularnie trenują tenis stołowy w ramach treningów klubowych. Badanie obejmowało kilka elementów. Pierwszym etapem było wypełnienie ankiety przez rodzica lub opiekuna osoby badanej. Następnie wykonano pomiar wysokości i masy ciała oraz sprawdzono, która kończyna dolna zawodnika jest kończyną dominującą. W następnej kolejności dokonano pomiaru z wykorzystaniem platformy Zebris FDM System. Badania na platformie Zebris przeprowadzono w postawie stojącej oraz w pozycji, jaką zawodnik przyjmuje w celu wykonania serwisu. W każdej z przyjętych pozycji dokonano trzech pomiarów.
Results: Spośród czternastu przebadanych osób 79% stanowiły osoby praworęczne. Wśród tych osób 82% w postawie stojącej w większym stopniu obciążało lewą stopę. Podczas przyjęcia pozycji do serwisu lewą stopę obciążało już tylko 36% osób praworęcznych. Stojąc w postawie, wszystkie przebadane osoby leworęczne obciążały w większym stopniu lewą stopę. W pozycji serwisu u osób leworęcznych wyniki były zróżnicowane. Na trzy przebadane osoby jedna obciążała bardziej lewą stopę, druga prawą, natomiast trzecia rozkładała obciążenie równomiernie. Wśród badanych dzieci osób było lub jest leczonych ortodontycznie. W pozycji postawy nie zaobserwowano znaczących różnic w obciążaniu przodostopia i tyłostopia. Wśród osób nieleczonych ortodontycznie w pozycji serwisu zaobserwowano tendencję do stuprocentowego obciążania tyłostopia lewej nogi oraz przodostopia prawej nogi. Nie zaobserwowano znaczących zależności pomiędzy stopniem obciążania przodostopia i tyłostopia a liczbą lat, od których dziecko trenuje tenis stołowy.
Conclusions: Podczas przyjęcia pozycji do serwisu zawodnik zmienia stopień nacisku podeszwowego stóp w porównaniu z pozycją postawy. Będąc w postawie, żaden z zawodników nie obciąża stóp równomiernie. Brak leczenia ortodontycznego może być czynnikiem wpływającym na procent obciążenia stóp w pozycji do serwisu. Wyniki przeprowadzonych badań nie są jednoznaczne. Wskazane jest przeprowadzenie badań na większej grupie zawodników.

Key words: tenis stołowy, nacisk podeszwowy, postawa ciała.

Skuteczność metod fizjoterapeutycznych w leczeniu szumów usznych u pacjentów z wykluczoną przyczyną laryngologiczną

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Wstęp: Szumy uszne są problemem, z którym spotyka się wielu ludzi, niezależnie od wieku, płci czy ogólnego stanu zdrowia. Szacuje się, że dotyczą one 5–15% populacji, a według aktualnych badań ich przyczyny są bardzo zróżnicowane. Szumy uszne powstają na tle problemów: laryngologicznych, neurologicznych, metabolicznych, farmakologicznych, trzewnych, mięśniowo-szkieletowych lub psychologicznych. Jedynie czasami są powiązane z problemami ze słuchem [1]. W obszarze zainteresowania fizjoterapeutów pozostają szumy uszne powstające na tle problemu innego niż ten stricte laryngologiczny. Badacze wciąż pochylają się nad tematem mechanizmu powstawania szumów usznych i skuteczności ich fizjoterapii. W związku z obserwowanymi wieloma mechanizmami ich powstawania istnieje także wiele metod leczenia [2].
Cel: Prezentacja metod fizjoterapeutycznego leczenia szumów usznych u pacjentów z wykluczoną przyczyną laryngologiczną.
Omówienie: Badania naukowe donoszą, że istnieje kilka podstawowych schematów postępowania u pacjentów z szumami usznymi [2]. Ważne jest, aby fizjoterapeuci w świetle najnowszych badań znali skuteczność poszczególnych metod w leczeniu tego problemu. Jako rozwiązania cieszące się największą skutecznością przytaczane są; zwiększanie zakresu ruchomości kręgosłupa szyjnego, zmniejszenie nadmiernego napięcia mięśni tej okolicy, trening posturalny, akupunktura, TENS, ale także terapia kognitywno-behawioralna [1, 2].
Podsumowanie: Szumy uszne są często występującą i niezwykle uciążliwą dolegliwością. W obszarze zainteresowań fizjoterapii znajdują się pacjenci, u których pomimo wykluczenia przyczyny laryngologicznej objawy są obecne. Zapoznanie się z aktualnymi trendami leczenia szumów usznych pozwoli fizjoterapeutom pomóc tej grupie pacjentów.

Słowa kluczowe: szumy uszne, otolaryngologia, fizjoterapia, *tinnitus*.

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Zaburzenia i jakość snu u kobiet po porodzie

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Wstęp: Obniżenie jakości snu oraz występowanie zaburzeń snu są powszechnymi problemami u kobiet w ciąży. Związane są one ze stanem psychicznym kobiet, jak również z ich wiekiem. Odczuwany przez kobiety w ciąży stres wpływa nie tylko na ich zdrowie, ale również płodu.
Cel: Celem pracy była ocena jakości oraz zaburzeń snu u kobiet we wczesnym połogu z uwzględnieniem chronotypu, jakości i satysfakcji z życia oraz poziomu stresu.
Materiał i metody: W badaniu uczestniczyło 148 kobiet w 2.–5. dobie po porodzie ($\bar{x}$ wieku = 31,04 ± 4,83 roku), u których przeprowadzono badanie kwestionariuszowe z zastosowaniem: autorskiego kwestionariusza ankiety oraz kwestionariuszy: „Skowronek-Sowa", Jakości Snu Pittsburgh (PSQI), skali: Senności Epworth (ESS), Odczuwanego Stresu (PSS-10) i Satysfakcji z Życia (SWLS), a także Skróconej Wersji Ankiety Oceniającej Jakość Życia (WHOQOL-BREF). Analizę statystyczną przeprowadzono z użyciem programu Statistica 13.
Wyniki: Badania wykazały obniżenie jakości snu u położnic, o czym świadczył wynik 8,09 (SD = 3,23) w skali Pittsburgh. Jakość snu była istotnie niższa u kobiet po CC niż u kobiet po porodzie SN (p = 0,0127). Nie zanotowano różnic pomiędzy jakością snu u pierworódek i wieloródek (p = 0,5861). U większości badanych (61,59%) nie stwierdzono zaburzeń snu. Wśród pierworódek zaobserwowano tendencję do większej senności niż w przypadku wieloródek (P = 41,03%, W = 35%; p = 0,0959), większą senność zaobserwowano również wśród kobiet po porodzie SN niż wśród kobiet po CC (CC = 37,04%, SN = 40,85%; p = 0,3211). Wykazano istotnie statystyczny wpływ obniżonej jakości snu na zmniejszenie jakości życia we wszystkich badanych dziedzinach – psychologicznej (p = 0,0063), somatycznej (p = 0,0000), socjalnej (p = 0,0038) oraz środowiskowej (p = 0,0361). Stwierdzono, że im wyższy poziom stresu u kobiet, tym gorsza jakość snu (p = 0,0009). Zaobserwowano gorszą jakość snu wśród kobiet o chronotypie umiarkowanie wieczornym w porównaniu z kobietami o chronotypie umiarkowanie porannym (p = 0,0094).
Wnioski: Wśród położnic obserwuje się obniżenie jakości snu. Chronotyp wieczorny charakteryzuje się gorszą jakością snu niż chronotyp poranny. Obniżona jakość snu wpływa na obniżenie jakości życia.
Słowa kluczowe: jakość snu, zaburzenia snu, ciąża, chronotyp.

Pediatrics, Neonatology and Case Report

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List of papers:

Case reports

Nocturnal non-dipping on 24-h ambulatory blood pressure monitoring in obese children and adolescents

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Introduction: Obesity is associated with abnormal nocturnal dipping of blood pressure (BP) in adults, which has significant negative impact on health outcomes. Few studies indicate the occurrence of this phenomenon in 35-50% of obese children and adolescents. Little data is related to the potential association between abnormal circadian rhythm of BP in children and the metabolic complications of obesity.
Aim of the study: The aim of the study was to evaluate the association between obesity, its metabolic complications and nocturnal non-dipping in children and adolescents.
Material and methods: In 207 obese children (mean BMI SDS 4.72, range 2.07-10.74), 97 (46.9%) boys, mean age 13.3 (range 2-17) standard 24-h ABPM was performed using an Ambulatory BP Monitor (Space labs 90217, USA). The calculation of nocturnal dipping was based on a formula by the American Heart Association: [(mean day BP – mean night BP)/mean day BP] × 100. Normal dipping was defined as a ≥ 10% decline in BP. Biochemical analysis included fasting glucose, and lipid profile.
Results: In all participants ≥ 70% of successful BP measurements were received. In total there were 106 (51.21%) cases of non-dippers. The mean 24-h nocturnal systolic BP reduction (%) was 9.9 ± 5.5. The mean 24-h nocturnal diastolic BP reduction (%) was 15.8 ± 8.5. There was no significant differences between non-dippers and dippers regarding fasting glucose (4.6 vs. 4.8 mmol/l), LDL cholesterol (2.64 vs. 2.51 mmol/l), HDL cholesterol (1.06 vs. 1.03 mmol/l) and triglycerides (1.36 vs. 1.34 mmol/l) levels. Total cholesterol level was significantly higher in non-dippers (4.34 vs. 3.99, $p = 0.03$). There was a significant correlation between BMI SDS and mean day-time SBP ($r = 0.14$, $p = 0.042$). There are positive correlations between 24-h heart rate (beats/min) and BMI SDS ($r = 0.15$, $p = 0.027$), between fasting glucose and systolic BP SDS ($r = 0.17$, $p = 0.03$), between mean diastolic BP and LDL cholesterol ($r = 0.23$, $p = 0.004$).
Conclusions: Over half of pediatric obese patients have nocturnal non-dipping. Higher BMI SDS is associated with higher mean day-time SBP and 24-h heart rate. Patients with higher LDL cholesterol levels have higher mean diastolic BP values as well. Non-dippers present with higher total cholesterol levels.
Key words: obesity, ABPM, nocturnal non-dipping, pediatric population.

Somatization disorder among children with fever of unknown origin

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Introduction: Somatization disorder (SD) is defined as the presence of one or more physical complaints for which appropriate medical evaluation reveals no explanatory physical pathology. Diagnosis of SD may be challenging as it is more exclusive and takes many investigations to rule out severe pathologies.
Aim of the study: To determine prevalence and characteristics of SD among children admitted to Children's Clinical University Hospital with fever of unknown origin (FUO).
Material and methods: A total, 141 children who fulfilled the criteria of FUO were enrolled in this retrospective, descriptive study. Study data were collected using patients' medical histories and electronic medical records from 2003 to 2018. All collected data were recorded and analysed in IBM SPSS Statistics 24.0.
Results: SD was confirmed in 26 (18.4%) of 141 patients, in 21 (14.9%) case SD was the only explanation of FUO. Mean age of patients with SD was 144 (± 40) of whom 14 (53.8%) were boys. Fever in hospital was observed in 16 (61.5%) patients. Most common complaints were headache ($n = 13$, 50%), weakness ($n = 6$, 23.1%), joint-pain ($n = 6$, 23.1%) and gastrointestinal symptoms ($n = 4$, 15.4%). Physical examination was without abnormalities in 11 (42.3%) patients. Lymphadenopathy and throat hyperemia were in 8 (30.8%), but hepatomegaly in 4 (15.4%) patients. Laboratory analysis revealed increased inflammatory markers in 7 (26.9%) patients. Thoracic X-ray was performed in 20 (76.9%) patients, abdominal ultrasound in 22 (84.6%), CT in 5 (19.2%), MRI in 11 (42.3%), skeletal scintigraphy in 2 (7.7%), fibrogastroscopy in 4 (15.4%), colonoscopy in 1 (3.8%), echocardiography in 12 (46.2%), trephine biopsy in 4 (15.4%) patients. In all cases, investigations were without abnormalities or showed unspecific findings. Before admission 10 (38.5%) patients were treated with antibiotics. Patients with SD spent median 8.5 days in hospital.
Conclusions: SD should always be considered in children with FUO without specific findings in primary evaluation and initial laboratory assessment to avoid unnecessary investigations, additional costs and use of antibiotics.
Key words: fever of unknown origin, somatization disorder, children.

Diagnostic reliability of clinical signs and Yale observation scale in recognition of serious bacterial infections in febrile children presenting to emergency department

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Introduction: Fever remains one of the most common reasons for seeking help at paediatric emergency departments

(ED). It is essential to recognize children with possible serious illness apart from the multitude of febrile patients. Several clinical signs, including Yale observation scale (YOS) have been identified as predictors of SBI in febrile children, with varying performance in different populations.
Aim of the study: To assess reliability of YOS and clinical signs at presentation for early recognition of serious bacterial infections (SBI) in children who present to ED with fever.
Material and methods: Children who presented to the ED of Children's Clinical University Hospital with fever between January and December 2019 were enrolled in a prospective observational study. The clinical signs at the time of presentation and Yale observation scale were recorded. SBI was defined as bacterial meningitis, pneumonia, acute pyelonephritis, osteomyelitis, bacterial gastroenteritis, severe skin and soft tissue infections, bacteraemia and sepsis. Data were analysed in IBM SPSS Statistics 22.0. Associations between clinical signs and SBI were assessed by Odds Ratios (OR) and Chi-squared/Fisher's exact test, the diagnostic value of YOS was assessed by Receiver operating characteristic (ROC) curve.
Results: The study included 246 patients aged 1 to 215 months of whom 128 (52%) were boys. 70 (28.5%) patients were diagnosed with SBI. Clinical signs associated with developing SBI (Odd's Ratio > 2, $p < 0.05$) were toxic appearance, tachypnoea, abnormal and reduced breathing sounds, shortness of breath, use of accessory breathing muscles and poor peripheral circulation. Temperature above 39°C or 40°C was not associated with SBI. Out of all patients, 147 were 0-5 years old of whom 39 (26.5%) children were diagnosed with SBI. YOS in this age group was assessed as unreliable predictive test for SBI with AUC (95% CI) = 0.56 (0.45-0.67).
Conclusions: Clinical features associated with SBI were similar to those identified in other studies. Yale observation scale was not predictive of SBI in patients till the age of five.
Key words: fever, serious bacterial infections, Yale observation scale.

Acute scrotal syndrome and its idiopathic form in ultrasound examination in adolescent boys

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Introduction: Acute scrotum syndrome is a set of symptoms that is characterized by redness, pain and swelling in the scrotum. Symptoms that may accompany the syndrome include fever, vomiting and the occurrence of a cord reflex. In a situation where it is not possible to define the cause of syndrome, its idiopathic form is recognized. Ultrasound examination allows finding the causes of acute scrotal syndrome and makes it possible to decide on the legitimacy of surgical intervention.
Aim of the study: Assessment of the effectiveness of diagnosing acute scrotal syndrome and the possibility of assessing the cause of inflammation.
Material and methods: A group of 47 boys, aged 6-18 years, was qualified for the study, who were confirmed with acute scrotal syndrome and the cause of its formation was confirmed. Philips IU 22 cameras with a 5-17Mhz probe and Seimens S2000 were used for the study. All patients were examined at the Diagnostic Imaging Department of the University Children's Hospital in Lublin.
Results: In the examined group of 42 boys, the causes of acute scrotal syndrome were confirmed by ultrasonography, in 7 patients the cause was testicular torsion, in 24 inflammation of the testis and epididymitis, in 3 testicular trauma, in 4 acute testicular hydrocele, in 3 hernia and 1 form of idiopathic inflammation.
Conclusions: Ultrasound examination is an extremely useful method in diagnosing acute scrotal syndrome and finding out the causes of it. Ultrasound examination is the gold standard in assessing changes in the scrotum and allows you to make accurate diagnoses for further treatment, which can be surgical intervention.
Key words: radiology, acute scrotum, pediatric's, ultrasound, ultrasonography.

The comparison of visual-spatial ability among girls with Turner's syndrome at the age of 10-15 and their healthy peers – preliminary results

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Introduction: Visual-spatial ability is one of the most important features, which enables humans to perceive the environment and helps in proper adaptation. It plays a huge role in planning, learning and memorizing. Some research show that females with Turner's Syndrome (TS) often demonstrate an unique cognitive profile characterized by relative weakness in visual-spatial area.
Aim of the study: Evaluation of visual-spatial ability by using "MRT-A – Mental Rotation Test" (Michael Peters, 1995) among healthy 10-15-year-old girls and with TS. Comparison of results will show the influence of this genetic abnormality on cognitive processes.
Material and methods: We obtained from Michael Peters (PhD) "MRT-A – Mental Rotation Test", based on the Vanderburg&Kuse project –commonly used tool in studies of spatial abilities. The questionnaire comprise 24 tasks with 1 model block and 4 similar, but in different position. The aim is to chose 2 of them, which are the same as the sample. The participant has 4min to do first 12 ones, 2 min break and 4 min for the second half of questions. The study group consists of 18 girls (mean age 12yrs 8mths) and the control group consists of 10 (mean age 12 yrs 5mths).
Results: The mean score in study group was 6.3 points (26.16%) vs. 8.3 (34.58%) in a control group. The best result in study group amounted to 11 (45.83%) vs. 13 (54.17%) in the control. On the other hand, the lowest in girls with TS was 1 (4.17%) vs. 5 (20.83%) in girls without this disturbance, which clearly illustrates the difference.
Conclusions: Patients with TS perform worse in visual-spatial tasks than their healthy peers. It is probably a common

result of hormonal, neuroanatomical and genetic abnormalities. Although about 83% of our patients in a study group receive estrogen supplementation, which should increase processing speed, we cannot totally compensate for hormonal deficits during brain development. It may affects on their school performance, especially learning mathematics and playing team sports.
Key words: visual-spatial ability, Turner syndrome, X-monosomy.

Searching for factors influencing the development of children with fetal alcohol spectrum disorders (FASD)

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Introduction: Fetal alcohol spectrum disorders (FASD) is a group of conditions associated with intrauterine ethanol exposure, resulted in several physical, cognitive and behavioural dysfunctions. It may affect more than 2% of Polish population; however due to delayed symptoms and mothers decision, who are unlikely to report alcohol consumption during pregnancy, it often goes undiagnosed. The caretaker usually reports such cases to the physician as a result of concerns with child's behaviour, learning disabilities and attention disorders.
Aim of the study: The aim of this study was to search for biochemical parameters and anthropometric measurements which may facilitate early diagnosis of FASD.
Material and methods: The archive data of 24 patients were assessed: mean age 8.2 ± 0.7, 15 boys and 9 girls, 6 live in biological families and were 18 adopted, diagnosed with FASD at the St. Louis Children Hospital. The data was collected by doctors during the medical examination, which consisted of anthropometric measurements (body mass, height and BMI) and biochemical parameters (vitamin D, ferritin, Fe levels, MCV, Hb). Patients were divided into 3 groups based on their age (1-5, 6-10, and 11-15) or place of living (biological family or foster family).
Results: Mean percentile of height, body mass and BMI were 45 ± 6.5; 43 ± 5.6 and 43 ± 5.1, respectively. We noticed difference between groups based on place of living in mean percentile of BMI (23 ± 6.2 vs. 46 ± 5.8; $p = 0.06$), height (49 ± 13.7 vs. 44 ± 7.6; $p = 0.74$) and body mass (35 ± 8.8 vs. 45 ± 6.9; $p = 0.45$). In the age groups (1-5, 6-10, 11-15), we observed an increase in percentile values for height (41, 46, 49; $p = 0.48$), body mass (29, 39, 53; $p = 0.14$) and BMI (37, 31, 57; $p = 0.01$). There are also differences between female and male patients: height (54 vs. 41; $p = 0.37$), body mass (53 vs. 39; $p = 0.27$), BMI (48 vs. 38; $p = 0.35$). Biochemical parameters showed no significant differences between groups.
Conclusions: Results of this study shows subtle differences in height, body mass and BMI in children with FASD. In children growing up in biological families, values of anthropometric measurements (BMI, body mass) were lower than in children growing up in adoptive families.
Key words: fetal alcohol spectrum disorders, FASD.

Measles in pediatric patients in Warsaw: a 3-year retrospective single centre study

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Introduction: Measles is an infectious disease caused by Morbillivirus. It is spread worldwide and remains an important cause of death among young children globally, despite the availability of a safe and effective vaccine.
Aim of the study: The aim of the study was to retrospectively analyze the clinical manifestations of measles among children admitted to the Department of Children's Infectious Diseases in Warsaw.
Material and methods: Medical charts of 84 patients diagnosed with measles from January 2017 to December 2019 were included. The demographic, clinical and laboratory data of children were analyzed. Measles was confirmed by PCR testing.
Results: There were 37 girls and 47 boys. The median age was 1 year and 11.5 months (range: 1 month to 16 years). The median number of days of hospitalization was 4. 5 children (5.95%) had a confirmation of one dose of vaccination. According to local guidelines, 21 children (25%) should have had full course of vaccination. 28 children (33.33%) were under the recommended age of administering the first dose. Fever and rush were present in 100% of children. The rush usually occurred 1 day before admission to hospital (36.90%). The median number of days after which it started to disappear was 5. 55 children had Koplik's spots (65.48%), 78 had cough (92.86%), 75 had conjunctivitis (89.26%). Splenomegaly was observed in 55.95% of patients and hepatomegaly in 33.33%. The disease was further complicated by pneumonia in 38 patients (45.24%) or acute otitis media in 19 (22.62%). 83 children (98.81%) needed symptomatic treatment and 58 (69.05%) were treated with at least one antibiotic.
Conclusions: The course of measles was typical in most cases. The disease was complicated in a significant number of patients. Most of the children diagnosed with measles have not been vaccinated. We should emphasize the advantages and importance of population vaccinations against measles.
Key words: measles, children, vaccination.

Survival rate among extremely preterm infants born at 22+0/7 weeks' to 23+6/7 weeks' gestation, 2004-2018

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Introduction: Premature birth defined as childbirth before the 37th week of pregnancy concerns 6-8% of all the pregnancies in Poland. It is a significant cause of infant morbidity and mortality. It is a group of newborns with high disease incidence and risk of future developmental disorders occurrence. Globally, prematurity is the leading cause of death in children under the age of 5 years.
Aim of the study: The paper is an attempt to present the statistic of extremely preterm childbirth and the survival rate among the newborns born at 22+0/7 weeks' to 23+6/7 weeks' gestational age in the Department of Neonatology and Neonatal Intensive Care, Medical University of Warsaw through the years 2004-2018.
Material and methods: A retrospective study of 151 infants born at 22+0/7 weeks' to 23+6/7 weeks' gestational age, birth weight of 400 g to 730 g in the Department of Neonatology and Neonatal Intensive Care between 2004-2018. Gestational age was based on the last menstrual period of the mother and corrected by a first-trimester ultrasonographic examination.
Results: 74.83% (113) newborns dead, 25.17% (38) survived including 25 (65.79%) girls and 13 (34.21%) boys. Children who lived developed significant impairments such as: 19 (50.00%) intraventricular hemorrhage – 3 (15.79%) of them were III/IV grade, 9 (23.68%) retinopathy of prematurity – 8 (88.89%) treated with laser therapy and 1 (11.11%) with ranibizumab, 4 (10.53%) necrotizing enterocolitis and 4 (10.53%) bronchopulmonary dysplasia, excluding 4 (10.53%) with ventilator-associated pneumonia.
Conclusions: Extremely premature infant and extremely low birth weight infant below 1000 g, remain at high risk for death. Rates of survival for infants born at the border of viability are still low. Survivability has not improved through the years, which results both from guidelines for making resuscitation but also from the limits of therapeutic options. This report should be considered for parental approaches and decision making in obstetric and neonatology departments. We plan to further analyze children's development.
Key words: newborns, extremely preterm, prematurity, survival rate.

Abnormalities and syndromes associated with congenital scoliosis: a retrospective study of 223 pediatric patients

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Introduction: The embryological development of the nervous, cardiovascular, and genitourinary systems are closely related to the development of the spine. Therefore, it is frequent to found abnormalities and syndromes associated with congenital scoliosis.
Aim of the study: To describe the clinical-radiological characteristics and to determine the incidence of abnormalities and syndromes associated with congenital scoliosis
Material and methods: Retrospective study of 223 patients with congenital scoliosis between 2014 and 2018. Demographic data (age, gender, follow-up), clinical and radiological data (type of spinal cord, cardiac, genitourinary, and/or vertebral abnormality) were recorded.
Results: The incidence of intramedullary, cardiac and genitourinary abnormalities were 15%, 9% and 20% respectively. The most prevalent type of abnormality among intraspinal, cardiac, and genitourinary abnormalities was syringomyelia (47%), ventricular septal defect (27%), and renal agenesis (12%). Syndromes were found in 22% of congenital scoliosis patients. Goldenhar syndrome was the most frequent syndrom (20%). Finally, the most frequent vertebral deformity was formation deformoty, according to the McMaster classification.
Conclusions: Surgeons should carefully evaluate additional intraspinal, cardiac, and renal abnormalities in congenital scoliosis as they increase the risk of intraoperative and postoperative complications.
Key words: congenital scoliosis, intraspinal abnormalities, cardiac abnormalities, genitourinary abnormalities, syndromes.

Case reports

New p.Ser237Asn activating mutation at the TSHR receptor, causing familial non-autoimmune hyperthyroidism

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Introduction: The pathogenesis of hyperthyroidism varies greatly, with familial non-autoimmune autosomal dominant hyperthyroidism being a rare cause. In patients who are genetically related, thyrotoxicosis develops without the clinical features of autoimmunity. In this study, we present five family members with familial hyperthyroidism who have a confirmed mutation of p.Ser237Asn in the TSHR receptor.
Case report: Our patient, a 13,5-year-old boy, presented with clinical symptoms that were characteristic for diagnosis, including tachycardia, weight loss, unexplained fatigue, muscle tremors, and advanced bone age. Also, abnormal laboratory results were observed [TSH < 0.01 μlU/ml (↓); fT3 7.79 pg/ml (↑); fT4 2.78 ng/ml (↑); TPO 6.3 IU/ml (N); ATG 15.7 IU/ml (N); anti-TSH < 0.3 (N)]. Increased vascular flow in the gland was noted on ultrasound. Treatment began four months ago, and consisted of MMI 0.5 mg/kg/day, which he is still taking, and β-blocker 0.5 mg/kg/day. No adverse effects were observed. His mother, a 36-year-old woman, was diagnosed in 2009 with non-autoimmune hyperthyroidism and has been treated with radioactive iodine since. Family history of hyperthryoidism was noted in both her sister and mother. The grandmother of our patient was initially diagnosed and treated with thyroid therapy at the age of 42, followed by radioiodine therapy, which resulted in her developing hypothyroidism. The boy's aunt received a thyroidectomy following an ineffective pharmacological treatment, and also currently presents with hypothyroidism. One of her daughters, although currently in good health, has a pathogenic mutation. Searching for the genetic basis of hyperthyroidism, blood was taken from the family members and sent to the Biomedicine Department of the University of Turku. A new mutation, p.Ser237Asn, was identified activating at the thyrotropin receptor in all family members, causing the overproduction of thyroid hormones and causing associated clinical features.
Conclusions: In patients who have developed non-autoimmune hyperthyroidism, deepened genetic history should be investigated, along with performing proper tests to possibly identify a gene mutation in the TSHR receptor. Proper radical therapy can be started following a correct diagnosis.
Key words: familial non-autoimmune hyperthyroidism, autosomal dominant.

Parainfectious opsoclonus-myoclonus-ataxia syndrome: a case report

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Introduction: Opsoclonus-myoclonus-ataxia syndrome (OMAS) is a rare neurological disorder, characterized by rapid, chaotic eye movements, myoclonus, cerebellar ataxia and irritability. OMAS is a parainfectious or paraneoplastic entity. In children it is mostly associated with neuroblastoma (NB) – at least 50% of cases.
Case report: A 1 year 8 months old girl developed progressive tremor in hands and head, truncal ataxia with unstable gait 2 weeks after Hand-Foot-Mouth-Disease caused by coxsackievirus. Within 12 days she developed an opsoclonus, intention tremor, cerebellar ataxia (Mitchell-Pike OMAS Scale – 10), the diagnosis of OMAS was made. Extensive investigations were done to exclude occult NB. MRI of the brain was performed and revealed meningeal enhancement. The MRI of the spinal cord, abdomen and small pelvis, as well as CT of the chest were normal. Laboratory investigations, including CSF analysis, paraneoplastic antibodies, NB marker neuron-specific enolase, did not revealed significant abnormalities. No catecholamine metabolites were detected in the urine. The most likely cause of OMAS in this case was an autoimmune response to a recent coxsackievirus infection (other possible infections were excluded). The patient received Methylprednisolone pulse therapy for 3 days and IVIg for 5 days that dynamically improved health status (OMAS 3). After discharge the girl received Dexamethasone for 3 days once a month, but within the next 2 months there was a deterioration (OMAS 5/6). The Rituximab was prescribed for 4 times – condition improved (OMAS 2/3). Prolonged rehabilitation until complete resolution of symptoms was recommended. Control MRI showed no pathology and complete resolution of symptoms (OMAS 0) was observed during follow-up.
Conclusions: Coxsackievirus infection can result in autoimmune genesis OMAS that can lead to severe long-term neurological symptoms, but contemporary treatment can achieve great results. Rituximab is effective for the treatment of corticosteroid and IVIg resistant OMAS. It is mandatory to exclude the NB for appropriate treatment and prognosis, as well as an accurate follow up should be performed.
Key words: opsoclonus-myoclonus-ataxia syndrome, parainfectious, Rituximab.

Megalencephaly-capillary malformation polymycrogyria syndrome with ERCC2 gene mutation – case report

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Introduction: Megalencephaly-capillary malformation polymycrogyria (MCAP) is a rare genetic multi-malformation condition with overgrowth of several tissues as the basis of the disorder. Macrocephaly, abnormal brain development followed by intellectual disability and capillary malformations are its primary features, but the spectrum of symptoms the patient might present is much wider, resulting in different clinical course. Many diagnostic criteria have been proposed by different authors, although due to unknown prevalence and only 150 affected individuals reported in medical literature, final diagnosis is based on clinical observation of the patient. The MCAP is caused by mutation impeding the PI3K/AKT signaling pathway regulating the cell cycle and influencing vascular and brain development. There is no causal treatment to the MCAP and other overgrowth disorders. Management relies on emergency treatment of dominant disturbances- neurosurgery or orthopedics interventions as well as constant follow up.
Case report: We present a case report of a 3-year-old male child with macrocephaly, multiple hemangiomas, hypotonia, cryptorchidism, syndactyly and dysmorphic features evident at birth. He was born at 32 weeks gestational age by cesarian section with 2, 6, 6 and 8 points in Apgar score in the 1st, 3rd, 5th and 10th minute respectively and directed to the intensive care unit due to respiratory failure. The newborn measured 50 cm with head circumference of 33 cm and weighed 2810 grams. His further history consisted of agenesis of corpus calossum, hydrocephalus, syringomyelia and Chiari malformation, which led to suspicion of megalencephaly-capillary malformation polymycrogyria. In spite of fulfilling clinical criteria of MCAP diagnosis, genetic analysis using NGS detected mutation unusual for this condition. The mutation of ERCC2 gene found in our patient is connected with increased oncological predisposition.
Conclusions: In this case report we present a patient with broad spectrum of disorders connected with rare megalencephaly-capillary malformation polymycrogyria syndrome. There are no known to us reports presenting ERCC2 gene mutation involvement in the MCAP.
Key words: overgrowth syndrome, megalencephaly, genetics.

Atypical manifestations of gastroesophageal reflux disease in a pediatric patient: a case report

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Introduction: Gastroesophageal reflux disease (GERD) is an intermittent or permanent passage of gastric content into the oesophagus, which can affect people of all ages. Although it is regarded as a multifactorial disease, the main pathogenic mechanism is the transient lower oesophageal sphincter relaxation. Regular exposure to gastric acid due GERD can affect and inflame the lining of the oesophagus causing laryngeal spasms which close the airway and prevent air and oxygen from getting into the lungs.
Case report: We present a case of a 11-year-old male patient who presented to the hospital with 15 days history of cough, dyspnoea, laryngospasm, vomiting and panic attack. His medical history revealed a systolic murmur at birth, bicuspid aorta at 4 years old and an episode of interstitial pneumonia. Preliminary clinical examination showed an overweight child, pale skin, discrete pharyngeal mucosal congestion, dry coughs in short periods followed intermittently by sensation of lack of air and laryngospasm, grade 2/6 precordial systolic murmur. Laboratory tests revealed leukopenia and hypocalcaemia. Chest radiograph showed bilateral hilar-basal accentuated pulmonary drawing, while esophago-gastro-duodenal transit showed stomach with tendency to volvulate with slightly thickened gastric folds. Oesophageal 24-hour pH monitoring established the diagnosis of gastroesophageal reflux disease. The treatment was appropriate for basic disease (lifestyle and diet modulation, antireflux therapy with proton pump inhibitors) with complete cessation of laryngeal spasms.
Conclusions: The peculiarity of this case is the clinical manifestations of gastroesophageal reflux disease in the patient which did not include heart burns often associated with the disease. Rather, the patient presented with laryngospasm and vomiting which can be caused by multiple factors. It also highlights the relevance of oesophageal 24-hour pH monitoring in confirming the diagnosis of the disease.
Key words: gastroesophageal reflux disease, laryngospasm, oesophageal 24-hour pH-monitoring.

The largest interstitial deletion 7p14.3p21.2 – case report and literature review

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Introduction: Deletions of the short arm of chromosome 7 are rare chromosomal findings. There were only several reported cases with similar deletion. The deleted region contains a number of genes, for instance HOXA cluster, where

mutations lead to hand-foot-genital syndrome (HFGS). The most interesting findings were additional, bilateral tags on the neck in our patient, haven't been seen yet in previously reported cases.
Case report: The newborn boy, from the first pregnancy of healthy and nonconsanguineous parents was born at 38th week of gestation by cesarean section. Birth weight was 2400 g (< 4th centile), length 52 cm (85th centile), head circumference 33 cm (20th-25th centile). The Apgar scores were 4 at 1st minute, 7 at 5th and 8 at 10th. Routine ultrasound examination at 11-13 weeks' gestation showed increased risk of trisomy 21 and trisomy 18 (NT – nuchal translucency = 4.5 mm (> 99th percentile)). Few days later NT was normal (2.3 mm) and invasive prenatal diagnostic procedures have not been undertaken. Moreover, ultrasound examination during the 3rd trimester showed fetal growth restriction and shortening of long bones. After birth nasal oxygen ventilation was needed due to a frequent desaturation episodes, especially during feeding. Laryngeal stridor and sucking problems were also noted. Dysmorphic features were evident and included: asymmetric palpebral fissures with a ptosis of left eyelid, small, low-set and dysmorphic ears, shortening of long bones. The patient's limbs and urogenital defects like hypospadias and cryptorchidism were similar with these presented in hand-foot-genital syndrome. Due to a set of dysmorphic features a karyotype was performed after birth. Results showed interstitial deletion 7p14.3p21.2 of 15 Mb.
Conclusions: Lack of 7p14.3p21.2 region belongs to the largest deletions, which were found so far. Further reports are necessary in delineation of phenotypic spectrum. To date, our patient has been found as an only child with additional tags on the neck.
Key words: deletion 7p, hand-foot-genital syndrome, additional tags, abnormal nuchal translucency.

Newborn death in the course of listeriosis. A case report

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Introduction: Listeriosis is a disease caused by *Listeria monocytogenes*, a facultative anaerobic, Gram-positive bacterium. It primarily affects older adults, persons with compromised immune system, pregnant women, and newborns. Maternal listeriosis presents with non-specific symptoms, therefore it is often misdiagnosed and can lead to severe complications, such as a spontaneous abortion, stillbirth, preterm delivery, neonatal sepsis or death.
Case report: In our clinic, a male newborn from the first pregnancy was born in 26th week of gestation by vaginal delivery. The pregnancy was complicated by antenatal infection with maternal fever of 39°C and tremors. The general condition of the infant was critical and his Apgar score was 2-3. The newborn suffered from respiratory and circulatory failure, anuria, intraventicular hemorrhage. The infant also had a floppy baby syndrome. An X-ray examination revealed airless lungs and RDS grade 4. The newborn was treated with artificial ventilation. The first dose of surfactant was administered in the 25th minute of life and the second dose after 8 hours. The circulation was supported by continuous infusion of catecholamines. The patient also received a continuous infusion of furosemide, but the diuresis has not improved. Due to the perinatal history and an extremely severe general condition, blood culture was collected and the empirical antibiotic therapy was administrated: ampicillin and gentamicin were replaced by vancomicin and meropenem. Laboratory tests revealed leukopenia, neutropenia and CRP 5.3 mg/d (norm 1). The blood culture revealed *Listeria monocytogenes*. Despite intensive treatment, the patient died.
Conclusions: Listeriosis is an uncommon disease in general population with the prevalence of 2-13/100,000 live births with mortality ranging from 20% to 60%. Fever and clinical presentation described as a flu-like syndrome are the most common symptoms in pregnant women, but fetal infection has serious consequences, such as respiratory failure, sepsis or multiple malformations. Neonatal listeriosis is extremely challenging for doctors.
Key words: listeriosis, newborn infection, *Listeria monocytogenes*, antenatal infection, bacterial infection.

Management of syndromes associated with Pierre Robin sequence – a case study report

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Introduction: Pierre Robin sequence is a congenital abnormality associated with micrognathia, glossoptosis and cleft palate. These malformations lead to airway obstruction and feeding difficulties therefore in those patients weight gain in first weeks after birth is challenging. Patients with PRS require specialized approach in airway management and different positioning of the infant in order to minimalize the risk of aspiration.
Case report: In out clinic a female infant was born in 40th week of gestation by vaginal delivery. The infant was hypotrophic with 2520 g birth weight but was scored 10 in Apgar scale. The patient had retromicrognathia, cleft palate, clubfoot and elongated fingers. Otherwise was in good condition. Echocardiography revealed foramen ovale and patent ductus arteriosus although both didn't require intervention. The patient suffered from breathing and feeding difficulties due to glossoptosis. Nasogastric tube was inserted to feed the patient and oral feeding was attempted using cleft palate teats. The infant was also put in ventral decubitus position to promote anteriorization of the tongue therefore unclogging the airways. This also managed gastroesophageal reflux. These measures were sufficient to reach proper weight gain in patient.
Conclusions: Main difficulty in Pierre Robin sequence lays in other than standard care routine. In most cases appropriate positioning solve the airway obstruction. When despite good positioning infants show evidence of desaturation nasopharyngeal tube is used but if this fail, surgical intervention is considered. Provided that the patient has no other abnormalities than Pierre Robin sequence and receive specialized care later development is normal. It is important to teach

parents of patients proper care routine to ensure continuity after hospital discharge. Usually patients don't require prolonged hospitalization and are under ambulatory care.
Key words: Pierre Robin sequence, congenital abnormality, micrognathia, cleft palate, glossoptosis,

Nijmegen breakage syndrome in Latvian paediatric population: a case series

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Introduction: Nijmegen breakage syndrome (NBS) is a rare, autosomal recessive, chromosomal instability disorder characterized by microcephaly with dysmorphic facial features, growth and mental retardation, primary immunodeficiency (PI), high predisposition to malignancy and infections. NBS has higher prevalence among Slavic populations, particularly Poland, the Czech Republic and Ukraine. A retrospective, population-based analysis of medical sources was performed. All 5 Latvian cases with confirmed NBS are summarised.
Case report: Of 5 paediatric patients with NBS, 3 were male and 2 females. 2 of 5 children were siblings in a family with no prior history NBS. The time of diagnosis ranged from 1 to 18 years. The diagnosis of the oldest patient was made after treatment of Non-Hodgkin's lymphoma (NHL). Clinical characteristics of all patients included microcephaly with "bird-like" facial features, growth retardation –2 to –4 SD and mild mental retardation, PI. 2 patients also had with café-au-lait spots. 1 child presented with hyper-IgM syndrome, 2 had hypoproteinemia. All patients experienced respiratory infections while 2 also had gastrointestinal infections. 4 of 5 known patients with NBS developed malignancies: 3 T-lymphoblastic NHL, 1 peripheral T-cell lymphoma. 3 children presented with lymphadenopathy, vena cava syndrome, mediastinal enlargement, malignant pleuritis and pericarditis. The average age of NHL diagnosis was 35 months (12 to 55 months). NHL was treated with NHL-BFM 95 protocol. In all cases, chemotherapy dose was reduced to 75%. Remission was achieved in 2 of 4 patients, while 2 showed fatal progression during therapy with CNS involvement for 1 child.
Conclusions: Since the first reported case of NBS in 1981, 5 Latvian patients have been confirmed. 3 patients are alive, 2 are in remission for 5 and 20 years. 2 patients receive immunoglobulin and 1 is followed by an adult immunologist. Treatment of infections require antibiotic therapy. Treatment of malignant complications remains challenging due to PI and increased toxicity chemotherapy.
Key words: Nijmegen breakage syndrome, non-Hodgkin's lymphoma, primary immunodeficiency.

Diarrhoea of unusual etiology in a child – a case report

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Introduction: *Clostridioides difficile* (CD) is a spore-forming Gram-positive bacillus that occurs mostly in adults and results in various clinical diseases e.g. pseudomembranous colitis. Although the disease occurs more often in elderly patients, it may also occur in children.
Case report: A 3.5-year-old girl presented on March 2019 to the Department of Children's Infectious Diseases, Medical University of Warsaw, with fever and bloodless diarrhoea. She had a history of two hospitalizations: first due to urinary tract infection (UTI) at the age of 1 y 4 mo, and the second one in the previous month due to antibiotic-associated diarrhoea after a 3-day therapy with cefuroxime due to UTI. Metronidazole was prescribed and after a rapid recovery, diarrhoea has recurred, which resulted in admission to the Department. The extended interview revealed that she has a grandfather, who remained under constant medical care in the retirement home and was colonized with extended-spectrum beta-lactamases (ESBL) *Escherichia coli* (EC). On admission, the girl was in a good general condition. Physical examination revealed features of dehydration. Laboratory testing revealed elevated inflammatory markers. CD O27/NAP1, EC ESBL(+) and vancomycin-resistant enterococci were detected in stool samples. Further stool examination excluded rotavirus, adenovirus, norovirus, *Salmonella*, *Shigella*, enterohemorrhagic EC, *Yersinia* and *Campylobacter* infections. She was treated with intravenous metronidazole (withdrawn after 2 days due to potentially irreversible neurotoxic effect) and with vancomycin per os. Due to abdominal pain symptomatic therapy was administered. After 13 days of hospitalization and successful treatment, the patient was discharged home in a good general condition. Further recommendations contained vancomycin p.o. for 8 weeks and probiotic therapy.
Conclusions: Diarrhoea caused by CD may occur in children. Contact with antibiotic-resistant bacteria-colonized patients may cause children colonization. It is important to maintain basic hygiene principles to avoid the transmission of drug-resistant bacteria among children.
Key words: diarrhoea, *Clostridioides difficile*, antibiotic-resistance, child.

A rare neonatal case of duodenal atresia caused by annular pancreas

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Introduction: Prenatal diagnosis of duodenal atresia and polyhydramnios. On further investigation, duodenal atresia was confirmed to be caused due to the rare condition of annular pancreas.
Case report: Diagnosis of duodenal atresia was established prenatally, leading to surgical consultation several months prior to birth. At this stage, planned treatment was primary reanastomosis. During further investigations postnatally, using duodenoscopy for further visualization, the diagnosis was altered to include the cause of atresia (annular pancreas), and such the treatment modality needed to be revisited. The treatment plan was changed to a surgical treatment via modified Ladd's procedure with appendectomy for malrotation. The neonate was to be sent for subsequent genetic testing due to other conditions that were recognized during admission: an undescended left testes, as well as polyhydramnios and a left pelvic kidney presenting prenatally.
Conclusions: Although duodenal atresia is quite common as a neonatal condition, it is important to properly identify the underlying pathology leading to its occurrence, such as an annular pancreas. Despite that it is a fairly rare condition, if diagnosed it leads to a change in treatment modalities.
Key words: duodenal atresia, annular pancreas.

Gastric ulcer developing after short-term NSAIDs administration in a small child: a case report

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Introduction: Peptic ulcer disease (PUD) is a multifactorial disease which represents the limited loss of substance to mucosa, submucosa and muscularis in the stomach or duodenum. PUD in children is reported worldwide, although it is relatively rare as compared with adults. Commonly used for pain management or acute febrile illness in children are non-steroidal anti-inflammatory drugs (NSAIDs) which are reported at high doses and a prolonged use to be a risk factor producing gastric lesions and leading to hematemesis and gastrointestinal bleeding.
Case report: A 2-year and 10-month-old female was given NSAIDs for an acute upper respiratory infection for 2 days, developed coffee-ground vomitus and epigastric pain one day later and was admitted to the hospital. Anamnesis revealed a respiratory disease for 48-hours treated symptomatically at home with Ibuprofen with three correct doses. Physical examination showed altered general condition, pale and dehydrated skin, suffering facies, pharyngeal congestion, distended abdomen, sensitive to superficial and deep palpation with maximum intensity in the epigastrium. During hospitalisation she had dyspeptic episodes accompanied by hematemesis and epigastric pain. Biochemical tests showed a minor hepatocytolysis syndrome. Abdominal ultrasound was normal. Esophagogastroduodenoscopy revealed that 2 cm from the pylorus was a 2/3 cm ovoid ulceration, antral purpuric gastric mucosa with fluid stasis and food scraps. It was negative for Helicobacter pylori infection. The patient was treated with a proton pump inhibitor (Esomeprazolum 1 mg/kg/day) for eight weeks. The evolution was favourable without any further gastrointestinal symptoms.
Conclusions: Gastric ulcers develop very rarely after a short-term administration of NSAIDs, but it is necessary to be careful using NSAIDs in children because it can induce gastric mucosal injury at any point after the start of administration which can lead to PUD and considering the risk factors before administering can lead to an appropriate management.
Key words: gastric ulcer, hematemesis, peptic ulcer disease, NSAIDs.

Management of a patient with refractory polyarteritis nodosa

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Introduction: Polyarteritis nodosa (PAN) is a rare type of necrotizing vasculitis affecting small and medium-sized arteries. Clinical presentation is variable including fever, weight loss, fatigue, myalgia, arthralgia, livedo reticularis and subcutaneous nodules.
Case report: A 7-year old boy with no significant medical history, presented with one-month long severe pain and swelling in multiple joints, low-grade fever and elevated inflammatory markers. Patient's condition improved upon receiving nonsteroidal anti-inflammatory drugs and he was discharged for outpatient work-up. A week later patient was readmitted with painful swelling and contracture of right wrist, myalgia of calf muscles, fever, fatigue and loss of appetite. MRI revealed diffuse muscle edema. Later on he developed two ecchymosis on the arm, subcutaneous nodules and livedo reticularis. Biopsy obtained from subcutaneous nodules confirmed the diagnosis of PAN. Associated infections (hepatitis B and streptococcal infection) were ruled out. Induction therapy with intravenous pulse-methylprednisolone and pulse-cyclophosphamide was initiated and stable remission was achieved. For maintenance therapy he received azathioprine, later changed to methotrexate. Seven month later patient had a relapse presenting with severe headaches and teary eyes, sharp abdominal pain, occasional fever, elevated inflammatory markers, fatigue, and arthralgia. Patient developed glucocorticoid-related side effects: Cushing's syndrome and secondary cataract. So far he has received 13 pulse-cyclophosphamide courses, but remission has not been achieved. Next step is administration of biological agent such as Rituximab, which would cause severe immunosuppression. Taking into account current COVID-19

pandemic, Tocilizumab will be administered instead. Tocilizumab is not included in treatment algorithms, but several published case reports demonstrate its efficacy in moderate cases.
Conclusions: PAN is rare in children and can have insidious onset. Long-term remission can be hard to achieve, but is possible in children. Disease and treatment-related complications remain significant concern for PAN.
Key words: polyarteritis nodosa (PAN), pulse-cyclophosphamide, Tocilizumab.

The complex clinical picture of a boy with a mutation in the gene encoding the DAX1 protein

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Introduction: X-linked hypoplasia of the adrenal cortex is a hereditary disorder of adrenal development and is caused by mutations in the DAX-1 (NR0B1) gene located on the X chromosome. DAX1 plays an important role in the proper development of hormone producing tissues such as adrenals, gonads, pituitary gland and hypothalamus. Mutations of this gene usually cause both congenital X-related hypoplasia associated with the X chromosome and hypogonadotropic hypogonadism.
Case report: The boy from first pregnancy, birth weight 3680 g, on the 10th day of life was brought to the emergency room due to seizures, further observed prolonged jaundice and darkened skin coloration. Based on laboratory and imaging tests, congenital hypoadrenocorticism was diagnosed (ACTH – 688 pg/ml, 17-OH-progesterone – 0.1 ng/ml, maximum cortisol after ACTH stimulation – 14 ng/ml). Hydrocortisone and fludrocortisone substitution therapy was included and symptomatic treatment was applied. At the age of 7, based on the clinical picture and positive family history, genetic etiology of the above disease was suspected. Molecular examination confirmed the presence of mutation in the DAX1 gene. At the age of 9, diagnostics of short stature was started (height 120.5 cm, htSDS = –2.9). Based on the tests, somatotropin hypopituitarism was diagnosed (maximum GH level in tests – 6.2 ng/ml, IGF-1 – 244 ng/ml, bone age – 6 years) and recombinant growth hormone treatment was initiated. At 12 years of age, due to the lack of characteristics of puberty, a gonadoliberin stimulation test was performed, based on which the boy was diagnosed with hypogonadotropic hypogonadism. Testosterone treatment was started. Currently, patient is 15.5 years old, his height is 162.5 cm (htSDS = –1.8), advancement of puberty characteristics on the Tanner scale: axillarche – 2, pubarche – 4/5, testicular volume 3 ml.
Conclusions: In the presented case, the early suspicion of congenital hypoadrenocorticism contributed to the rapid accurate diagnosis. However, when putting such a diagnosis in childhood, one must keep in mind the possible genetic background of the disease. It should also be remembered that a mutation in the DAX1 gene most often leads to adrenal insufficiency and hypogonadotropic hypogonadism, and can also coexist with hypopituitarism in terms of other tropic hormones. Despite the complex clinical picture of the disease, the prognosis is favorable, provided that it is diagnosed early and that hormone supplementation is proper.
Key words: DAX1, hypoadrenocorticism, hypogonadotropic hypogonadism, short stature, genetic disease.

Prolonged severe pancytopenia after liver transplantation due to fulminant hepatic failure caused by mushroom poisoning reveals an underlying Fanconi anemia

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Introduction: Fanconi anemia (FA) is a recessive autosomal or X-linked inherited syndrome. Patients suffer from childhood-onset progressive pancytopenia, congenital malformations and susceptibility of developing malignancies. Allogeneic hematopoietic stem cell transplantation (HSCT) remains the best option for treatment of FA.
Case report: A 5-year old girl developed nausea and vomiting approximately 7 hours after ingestion of poisonous mushrooms (*Amanita virosa*) on 05.09.2010. The patient was admitted to the ICU of the Children's Clinical University Hospital in Riga due to severe gastrointestinal symptoms and diplopia. In the next four days, the patient's clinical status deteriorated, she developed a fulminant hepatic failure (INR 4.85, pro-thrombin complex 13.7%). The patient was urgently transfered to University Medical Center Hamburg-Eppendorf where she underwent an adult-to-child living donor liver transplantation, the donor was her father. After the transplantation, a persistent pancytopenia was noted. Bone marrow biopsy performed in 09/2011 revealed hypocellularity. At first it was associated with possible myelotoxicity. The girl had become dependent on blood transfusions. In 2013, chromosomal breakage analysis and molecular genetic testing confirmed a specialist`s clinical suspicion of FA. Although HSCT from her father would have provided tolerance to the liver graft and allowed to discontinue immunosuppressive therapy, respecting the opinion of parents, HSCT was delayed with the use of transfusions and androgen therapy. In 2017, therapy was interrupted due to negative side effects. Preparation for HSCT was begun. Unrelated donor re-HSCT was performed in 03/2018 after rejection of the initial related donor's HSCT in 01/2018.
Conclusions: This case report underlines the necessity to consider FA as a differential diagnosis of any patient with hypoproliferative cytopenia. Toxic myelosuppression could have been the trigger for FA manifestation in this coincidental situation and may have induced accelerated decline in hematopoietic stem cells. There are no literary sources available on treating children with FA and liver transplants.
Key words: poisoning, liver transplantation, Fanconi anemia.

Genetically approved MODY3 with uncharacteristic manifestations

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Introduction: MODY3 is caused by mutation in HNF1A gene and is associated with hepatic adenomas (HA) and renal carcinoma (RC). MODY usually manifests between age 6 and 25 with progressive insulin deficiency, hyperglicemia and is often misdiagnosed with other types of diabetes (OTD). Patients are sensitive to therapy with sulfonylureas.
Case report: 13 y.o. girl was appointed to endocrinologist (ECL) due to elevated fasting blood glucose (BG) – 9.34 mmol/l. Patient (P) has been supervised by ECL before because of accelerated growth and her mother has glucose tolerance disorder (GTD) since age of 15. P was admitted to hospital. Laboratory results revealed BG- 10.62. Objectively girls' weight was +2 SD, height +1 SD, wrist X-ray showed accelerated bone age and closed growth plates. She has mild mental retardation, learning issues. Ophthalmologist revealed bilateral juvenile cataract(BJC), craniofacial dysmorphias – protruding ears, almond type eyes, thick and rare eyebrows, dental caries, tapered toes. An abdominal US revealed hepatomegaly and diffuse changes in liver, abdominal MRI showed multiple formations in liver, biopsy confirmed HA histologically. Thoracic CT scan revealed 2 nodules in left lung with unclear etiology. Genetic counselling revealed huge pedigree with different types of GTD. Maternal grandmother had GTD and died due to RC at age of 60. NGS for MODY gene panel revealed heterozygous variant HNF1A, c.872dupC, p.(Gly292Argfs*25) which is classified as pathogenic and confirms MODY3 and might be associated with HA. Exome analysis was performed to rule out other genetic conditions to explain other symptoms but no extra variants found. The carrier status analysis for mother was performed and confirmed MODY3. Now P receives Diaprel, diabetes is well controlled, receives regular check-ups for liver and lungs, hepatomegaly is increasing but the changes in lungs are stable.
Conclusions: NGS revealed mutation associated with MODY3 and HA while other symptoms are hard to explain. BJC might be because of microvascular complications as in T2D but lung changes are unclear. It is important to distinguish MODY from OTD because of the therapy and possible complications differences.
Key words: MODY3, HNF1A gene, diabetes.

Acute kidney injury in child after acidental contact with lagards of the gender *Lonomia obliqua*: case report

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Introduction: The article reports a case of acute kidney injury (AKI) in a child after contact with the caterpillar *Lonomia obliqua* (LO) whose venom acts on the inflammatory and coagulation system causing hemorrhagic syndrome similar to disseminated intravascular coagulation (DICC), hemolytic anemia and also AKI. Possible pathophysiological mechanisms of AKI include: deposition of microthrombi in the glomeruli, nephrotoxicity by hemoglobinuria, nephrotoxicity by direct action of the poison and ischemic effect by hemorrhagic shock associated with hypotension. In the case described there is no evidence of hemorrhagic shock and, more probably, AKI resulted from the nephrotoxic action of the poison and also from hemoglobinuria. A factor that may have contributed to this occurrence is the fact that the patient received SAlon only 48 hours after the accident.
Case report: At hospital admission the patient presented gingivorrhagia, myalgia, abdominal pain, jaundice and oliguria. The patient was referred to the ICU and received support measures and 4 ampoules of antilonomic serum (SAlon), which evolved with an improvement of the coagulation disorder, however, presenting worsening of AKI with indication of renal replacement therapy. After 12 days of hospitalization she was discharged from hospital with normal renal function.
Conclusions: Accidents due to contact with caterpillar lonomia may result in coagulation disorder, hemolytic anemia and AKI. AKI has been identified as an important prognostic factor. Specific and early treatment with SAlon is critical.
Key words: *Lonomia obliqua*, acute kidney injury, child, caterpillar.

Severe undernutrition of a 7-year-old boy with cerebral palsy – a case report

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Introduction: Vitamin C deficiency is described as a disease of the past in developed countries, but there are still cases of scurvy occurring among children with dietary restrictions. Its manifestations include haemorrhages, hyperkeratosis and musculoskeletal symptoms. The diagnosis of scurvy is often delayed as it mimics other common diseases.

Case report: A 7-year-old boy presented with haemorrhagic diathesis, a gingival hypertrophy and severe joint pain. The patient suffered from cerebral palsy and blindness due to prematurity (24 weeks of gestation). However, he could walk and eat on his own before. His diet was restricted to food he liked and consisted mostly of bread and cheese. On admission, the boy was fretful and ailing, lying in foetal position and in limited contact. Physical examination revealed severe undernutrition. There were petechiae and bruises all over his face, neck and limbs; his gums were swollen and bleeding. Musculoskeletal examination showed hypertonia and flexion contracture of hips and knees, every attempt to move or even touch was extremely painful for the patient. Blood tests revealed thrombocytopenia, low haemoglobin level and low inflammation markers. Due to the suspicion of leukaemia, bone marrow biopsy was performed, but it only revealed dyserythropoiesis. As a result of massive gingival bleeding, fresh frozen plasma, red blood cells and platelets were transfused several times. Percutaneous endoscopic gastrostomy was inserted and nutritional treatment was introduced. Analgesic treatment (nalbuphine) was provided and infusion of vitamin C was administered. Improvement of his general condition and weight gain were observed. Vitamins test results revealed low level of vitamin C (< 0.4 mg/l), which confirmed the diagnosis of scurvy. The patient was discharged from hospital in good condition, walking on his own and smiling after a month of hospitalization.
Conclusions: Scurvy is a disease caused by the deficiency of vitamin C. Nowadays, it is extremely rare in developed countries and therefore rarely included in differential diagnosis. However, in paediatric population it can be observed in children with dietary restrictions associated with neurological disorders (e.g. cerebral palsy), autism spectrum disorders or mental illness. Careful analysis of diet and nutritional status in this population is essential to avoid severe consequences of vitamin deficiency.
Key words: cerebral palsy, vitamin C, scurvy, undernutrition.

A rare case of acute, neonatal appendicitis with perforation in preterm

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Introduction: The aim of the study was to describe a rare case which is acute appendicitis in a newborn baby. Acute appendicitis is common cause of acute abdomen in children. The smaller the child is, the less characteristic the symptoms are. The most common of these is increasing abdominal pain intensified in the lower right, preceding fever, nausea, vomiting or anorexia. Acute appendictis is rarely considered in newborns and infants as the etiological factor of acute peritonitis. However, the presented patient with a genetic defect, severe pregnancy and postpartum complications developed the above disease entity.

Case report: A newborn male from third pregnancy, third delivery, born at 37 weeks gestation, by average Caesarean section with a body weight of 3360. He received 6 points on the Apgar scale at the 1st minute of life, 6 points at the 3rd minute of life and 8 points at 5 and 10 minutes of age. After birth, the child required respiratory support. In the physical examination, generalized edema, reduced muscle tone, facial dysmorphism (in the karyotype study, deletion of the long arm of chromosome 15 in the 15q13 region). After initial stabilization, the child was transported to the neonatal intensive care unit, monitored, complete parenteral nutrition implemented. In the first day of life, due to significant hypercapnia and lack of respiratory drive, the child was intubated and connected to a respirator. On the second day of life, enteral nutrition was introduced with a replacement preparation with an increased degree of protein hydrolysis. On day 11 of life signs of food intolerance were found, green backlog was observed in the stomach probe, and blood was present in the stool. Imaging tests were commissioned: abdominal USG – air bubbles in the portal vein, X-ray of the abdominal cavity – perforation features. After surgery, the child was qualified for laparotomy. Intraoperatively, gangrenous perforated appendix with diffuse peritonitis was found. The appendix was removed and peritoneal drainage performed.
Conclusions: Acute appendicitis is a common phenomenon in childhood, but this diagnosis is rarely considered in the differential diagnosis of acute abdomen in the neonatal period, since the incidence of this condition ranges from 0.04 to 0.2% and is more common in premature babies. The clinical picture of neonatal acute appendicitis is unspecific and may lead to delayed diagnosis and misdiagnosis of necrotizing enterocolitis, which is a much more common condition in the neonatal period.
Key words: appendicitis, neonatol, preterm, perforation, necrotizing enterocolitis.

Unusual hematological disease in an 8-year old girl with Fanconi anemia

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Introduction: Median age of myelodysplastic syndrome (MDS) patients is 65-75 year old. Some genetic syndromes are connected with increased susceptibility of earlier onset of MDS – for example Fanconi anemia. Nevertheless, it is uncommon for children. Furthermore some chromosomal aberrations involving chromosome 3 and 7 are linked with higher probability of MDS. MDS can transform into chronic myelomonocytic leukemia (CMML), that is really rare for a pediatric population. A median age of onset in fourth and fifth decade of life, more probable in men that in women.
Case report: I present a 8-year old girl with very rare early onset of MDS, that later transformed into CMML. The patient presents with multiply diseases – chromosomopathy VIII – the aberration that isn't common in MDS cases, anomalous origin of the left coronary artery from the pulmonary artery called White-Bland-Garland syndrome, that was operated in 2nd month of life. Girl had an ectopic left kidney in pelvic, hypertrophic left ventricle and suspected Fanconi

syndrome. Patient was classified to bone marrow transplantation after 3 cycles of Vidaza (azacytidine) as a treatment of CMML. After the first cycle of therapy she developed complications – fever, fragility and finally septic shock. After stay at Intensive Care Unit girl was disqualified from following azacytidine therapy. During the wait time for bone marrow transplantation she developed suprasternal and cervical abscesses, necrotizing pneumonia, and multi-organ failure. At first it was treated as pneumonia without effect, then the girl underwent extensive diagnostic procedures. She didn't improve after broad spectrum antibiotic therapy, antifungal treatment, steroids, transfusions of washed PLTC and PRBC, inotropic support, immunoglobulins, parenteral nutrition and gave fatal outcome.

Conclusions: The case presented was a challenge for specialist due to the rarity of similar patients in pediatric population – she was tested for genetic, hematologic, infectious and autoimmune diseases, but with fatal outcome. It is crucial to learn from this kind of cases to care for and treat more successfully patients with Fanconi anemia.

Key words: Fanconi anemia, MDS, CMML, complications after Vidaza chromosopathy 8.

How long congenital diaphragmatic hernia can be asymptomatic? – case report of late presenting congenital diaphragmatic hernia

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Introduction: Congenital diaphragmatic hernia is an anatomical abnormality of the diaphragm that is dome-shaped skeletal muscle separating the thoracic cavity from the abdominal cavity. Such malformation allows protrusion of abdominal viscera into the chest. Symptoms of congenital diaphragmatic hernia usually occur in neonatal period but in rare cases symptoms might be delayed. There are two common types of diaphragmatic hernia – Bochdalek hernia and Morgagni hernia. Bochdalek hernia affects the posterolateral part of the diaphragm whereas Morgagni hernia is defined as herniation through the foramina of Morgagni.

Case report: A previously healthy 4.5 year old boy was admitted to the Department of Pediatric Pulmonology, Allergology and Clinical Immunology with aggravated cough causing vomit and fever up to 38°C. At admission the auscultation revealed wheezing on the right chest field whereas decreased breath sounds and vivid peristalsis on the left chest field. Chest radiograph was performed. Aside from pneumonia the examination also demonstrated gastrothorax on the left side with a mediastinal shift to the right side. Computed tomography (CT) of the chest showed left sided diaphragmatic hernia with noticeable herniation of the stomach, spleen and small bowel into the left hemithorax. The patient underwent thoracoscopic surgery that fully closed the hernia. After three days in follow-up CT inappropriate spleen blood supply was observed. A laparotomy was performed and rotated spleen was uncoiled. During the surgery splenic blood flow was restored and symptoms of spleen ischaemia were alleviated. In the next couple days splenic flow did not increase and necrosis signs were observed. This led to reoperation and the necrotic part of the organ was removed.

Conclusions: This case shows that congenital diaphragmatic hernia should be suspected in any child presenting aggravated respiratory symptoms and unusual chest radiograph even among older children although a late presentation is uncommon. An early diagnosis will enable initiating appropriate treatment. This case also highlights the significance of medical imaging in diagnosis and surgery management of diaphragmatic hernia.

Key words: congenital diaphragmatic hernia, medical imaging follow-up.

Meningococcal septicemia caused by serotype W135 complicated by an unrecognized immunodeficiency in a two month old child – a case report

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Introduction: *Neisseria meningitidis* is a cause of invasive and life-threatening meningococcal disease. While serogroup B and C are more in the european focus, the serogroup W-135 subsequently caused sporadic disease, mostly in sub-Saharan Africa. An increased risk of severe infection with *Neisseria meningitidis* is seen in patients with deficiencies of the terminal complement system (C5-C9). Here we present the case of serogroup W-135 meningococcal disease with severe complications in an infant with humoral immunodeficiency.

Case report: A two-month-old term born Caucasian boy was admitted to the intensive care unit with a history of one day fever. Petechial lesions appeared the following day progressing rapidly. After laboratory tests, diagnosis of meningococcemia to be *Neisseria meningitidis* serotype W135 was confirmed. He was sedated, intubated, his blood pressure was stabilized and an empirical antibiotic therapy with Meropenem and Vancomycin was started. Despite intensive therapy, extensive thrombotic lesions with skin necrosis of the extremities developed and led to the inevitable amputation of the left leg and part of the right foot. Acute renal failure required venovenous haemodialysis. Due to the severity of the infection, the immune system was evaluated and revealed low levels of IgA, IgM, IgG with subclasses IgG1 and IgG2. X-linked agammaglobulinemia was excluded. The immunoglobulin replacement therapy – first intravenous, later subcutaneous – was started. A careful clinical interview showed that the most likely source of infection was the patient's aunt from Scotland who visited the family.

Conclusions: Our case shows the life-threatening course of meningococcemia serotype W135 in a polish infant with humoral immunodeficiency.

Key words: *Neisseria meningitidis* W-135, humoral immunodeficiency, disseminated intravascular coagulation, septicemia.

Papillary thyroid carcinoma in a 17 year old female patient with autoimmune poliendocrinopathy syndrome type 3, APS-3 (type 1 diabetes mellitus and Hashimoto's thyroiditis)

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Introduction: Hashimoto's thyroiditis is an autoimmune, inflammatory disease which could coexist with other autoimmune diseases such as type 1 diabetes, celiac disease or rheumatoid arthritis. There might also be a connection between Hashimoto's thyroiditis and thyroid carcinoma, which remains a source of controversy among the researcher community. Here we present a case of a 17-yo girl with coexisting type 1 diabetes mellitus, Hashimoto's thyroiditis (APS-3) and papillary thyroid carcinoma.
Case report: A 17-yo female patient of the Department of Pediatric and Adolescent Endocrinology in Cracow presented with a palpable nodule in the lower quadrant of the right thyroid lobe. As a 12-yo she was diagnosed with type 1 diabetes mellitus and 3 months later with Hashimoto's thyroiditis. An ultrasound examination of the nodule revealed a conglomerate of normo/hyperechogenic nodular lesions surrounded by a hypoechogenic limbus with a total size of 9 × 8 × 13 mm, with features of increased vascularization. A fine needle biopsy was performed and a suspicion of papillary thyroid carcinoma was raised. The patient underwent a total thyroidectomy with medial lymph node biopsy and an autotransplantation of the lower right parathyroid. The patient was attending follow-ups and received substitutional thyroid hormone treatment.
Conclusions: Some researchers believe that Hashimoto's thyroiditis is a risk factor in developing thyroid carcinoma, with some going as far as calling Hashimoto's thyroiditis a paraneoplastic syndrome of thyroid carcinoma. This is of clinical significance as such association would warrant screening for papillary thyroid carcinoma in Hashimoto's thyroiditis patients.
Key words: Hashimoto's thyroiditis, papillary thyroid carcinoma, APS-3.

Familial x-linked intellectual disability causal mutation identification using whole exome sequencing

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Introduction: The relatively high prevalence of an intellectual disability and its variability induce active research of the etiology of this disorder. Upon the observation that it occurs with 20% higher frequency in males than females extensive studies of X chromosome-linked disorders affecting intelligence are held. 145 genes in X chromosome are currently known to be linked with intellectual disability and it comprises 17.12% of all coding sequences in X chromosome, in comparison with 5.43% on average in autosomes.
Case report: We were presented with two male brothers at the age of 12 and 8. Both patients were cognitively and motorically delayed. One patient was unable to construct sentences and started to walk at the age of 4.5, in addition, he experienced stereotypical arm movements. Another patient was evaluated to produce speech, typical for a 15-16-month-old child, he started to walk at the age of 4 and presents grimacing smiling. Both patients experience seizures and intellectual disability of an unknown cause. Based on the genealogical analysis, we predicted that the inheritance pattern of the mutation is X-linked. Our aim was to analyze whole exome sequencing (WES) data of two sibs and their parents using in silico methods in order to find potential intellectual disability causing genes and to create a further investigation plan for confirmation of the causal pathogenic variant. Samples for WES were taken from both sibs and their parents. From 3974 pathogenic variants, 6 in X chromosome were selected for further investigation. They were analyzed using Sift, PolyPhen, Mutation Taster (MutT) and Human Splicing Finder (HSF) software. For further description, ExAC, 1000G and HGMD databases were used. After in silico analysis, the most likely candidate was SLC9A6. This gene is associated with Christianson syndrome, which frequency in the population is < 1/1 000 000. Clinical presentation of this syndrome involves intellectual disability, seizures, absent speech and stereotypical movements which strongly fits the clinical presentation of our patients. Our investigated SLC9A6 pathogenic variant was not previously described in literature. 3D models created with Phyre 2 software showed abnormal Na/H antiporter 6, an SLC9A6 gene product.
Conclusions: It was concluded that the identified SLC9A6 pathogenic variant is fitting our patients' clinical presentation and is altering the gene product significantly and sufficiently to induce symptoms. For the confirmation of this mutation causing altered splicing, it is planned to perform in vitro analysis of the SLC9A6 mRNA/cDNA.
Key words: X-linked intellectual disability, intellectual disability, familial intellectual disability, Christianson syndrome.

Germ cell tumor of the mandible

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Introduction: Germ cell tumors (GCT) are neoplasms derived from germ cells. The main cause of their appearance is a violation in the migration process during the embryogenesis. GCT can be divided into gonadal and extragonadal. Extragonadal usually begin in organs along the axial skeleton: mediastinum (40-50%), retroperitoneum (30-40%), sacrococcygeal region (40%).
Case report: Patient: a 2-year-old boy. At the age of 1 year parents noticed swelling of the right cheek. The presumptive diagnosis was a sialodenitis. Ultrasound of salivary

glands and computer tomography of head showed a tumor of the right mandible. The further examination and treatment was held in the N.N. Blokhin Russian Cancer research Centre. The results of the instrumental diagnostics: MRI of head and neck region – right ramus of mandible was totally distructed, extraosseous component of the tumor 51 × 45 × 53, represented by a multinodular solid structure, CT scan of breast – metastatic lung cancer, skeletal scintigraphy – diffuse accumulation of radiotracers in the right temporal region, serum tumor marker test – AFP 21700 μg/l, β-hCG normal, biopsy – yolk sac tumor. According to the results of the examination the diagnosis was an extragonadal germ cell tumor (pure yolk sac tumor) of right mandible, T2bN0M1, Mts in both lungs, 4 stage. High group of risk. Treatment involved 5 cycles of chemotherapy (scheme CBEP) and surgical treatment, which included the resection of the right lower jaw and reconstruction with the sternocleidomastoid muscle. The child tolerated treatment satisfactorily. AFP level was measured after treatment and showed a decline to normal values. Special treatment was over. The child was discharges under dynamic observation. At the time of publishing this article, the boy is alive with no evidence of recurrence or progression of the disease.
Conclusions: Malignant germ cell tumors represent 3% of neoplasms in the pediatric population. Yolk sac tumors (endodermal sinus tumors) are the most common malignant germ cell tumors in this age group. There are only 3 reported cases of YST of mandible. It may be difficult to diagnose GCT because of the lack of specific symptoms. Serum tumor markers such as AFP and β-hCG are highly specific for GCT. Successful treatment should combine chemotherapy and surgical operation.
Key words: germ cell tumor, yolk sac tumor.

Masks of polyarteritis nodosa in paediatric practice

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Introduction: Polyarteritis nodosa (PAN) is a rare type of vasculitis in childhood. We intend to describe 2 PAN cases who were treated in Children's Clinical University Hospital (CCUH) in 2017 and 2018.
Case report: Case 1. A 7-year old boy presented to emergency department with pain in right hand, elbows, shoulders, knees and feet for 1 month, fever for the last week. He had reduced range of motion and pain on palpation in these joints. Laboratory analysis showed increased inflammatory markers. X-ray, ultrasound and MRI of involved joints were normal, but whole-body MRI described muscle edema in upper arms and legs. The patient was treated as reactive arthritis and myopathy with NSAIDs. One week later he was readmitted to hospital because of persistent fever, pain in calves and right hand. He had livedo reticularis on legs and two haematomas on arms that transformed into painful nodules in next day. Skin biopsy from the nodule confirmed PAN. Treatment with pulse methylprednisolone (MPDN) and cyclophosphamide was initiated effectively. Patient has had 3 exacerbation episodes since then. Currently he is on clinical remission still on cyclophosphamide and MPDN. Case 2. A 14-year old boy was admitted to CCUH with fever and cough for one month. He had high inflammatory markers, therefore empirical treatment with ceftriaxone was initiated. However, fever continued, pain in leg muscles and maculopapular rash appeared. Later lymphadenopathy and skin desquamation from extremities occured, therefore he was treated as Kawasaki disease with immunoglobulins. In one week purple, palpable, tender nodules appeared on thighs and upper arms. Skin biopsy from the nodule revealed PAN, and treatment with pulse MPDN, azathioprine and aspirin was initiated with positive effect. He developed one exacerbation some months later. Currently the boy is on remission still on MTX and low intermittent dose of peroral MPDN.
Conclusions: These cases represents two different clinical courses of PAN. PAN should always be considered in patients with prolonged fever, arthralgias, myalgias and skin involvement as it can mimic other diseases.
Key words: polyarteritis nodosa, paediatrics.

Childhood-onset systemic lupus erythematosus in patient with multiple congenital disorders

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Introduction: Childhood-onset systemic lupus erythematosus is a rare, severe autoimmune disease with renal involvement in majority of cases. We want to present a case of lupus nephritis in patient with multiple congenital disorders.
Case report: A 10-year old girl with history of tetralogy of Fallot (corrected with ventriculopulmonary conduit), left kidney agenesis, polydactyly and ear deformities was admitted to Children's Clinical University Hospital with progressive dyspnea, reduced tolerance on physical activities and fatigue for 3 days, dry cough, vomitting and diarrhea. Physical examination showed signs of dehidratation. Laboratory analysis revealed increased potassium (5.56 mmol/l), creatinine and urea levels (1116.56 μmol/l and 68.08 mmol/l), anemia and thrombocytopenia, increased CRP (22.59 mg/l). She had haematuria, proteinuria (5 g/l) and leukocyturia. Although patient received rehidratation therapy, diuresis decreased and it was decided to initiate peritoneal dialysis (PD). During the course of PD patient had preserved diuresis with intermittent macrohaematuria. However, laboratory findings were without positive dynamics, fever episodes, edema on shins and eyelids was observed. CRP gradually increased, thrombocytopenia, leukopenia and anemia became more severe, urine analysis were without changes, therefore autoimmune disease was suspected. Immunological analysis revealed positive ANA, ds-DNA antibodies and decreased C3 levels. Kidney biopsy was performed and histopathology report described rapidly progressive glomerulonephritis with C3 and C1q deposits. Treatment with pulse methylprednisolone was initiated without cyclophosphamide because of pancytopenia, but one week later hydroxychloroquine and mycophenolate mofetil was added. Positive effect was observed: kidney function improved, reaching GFR 33 ml/min/1.73 m^2, haematuria and proteinuria decreased

(0.75 g/l), PD was interrupted 3 weeks after initiation of immunosuppressive treatment.
Conclusions: This case describes rare and complex combination of diseases that must be solved and further monitored by multidisciplinary team.
Key words: paediatrics, lupus nephritis, congenital disorders.

A possible connection between diabetes mellitus in patients and juvenile idiopathic arthritis

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Introduction: Autoimmune diseases usually start by coherence between genetic and environmental factors and are determined by the loss of immunologic tolerance to self-antigens, but also viral infections can trigger this response. Juvenile idiopathic arthritis (JIA) is the most common autoimmune chronic rheumatic disease of childhood, before the age of 16. Children and adolescents with JIA are therefore likely to develop other autoimmune diseases. Previous studies indicate that the absolute risk of diabetes in JIA patients was low. However, studies assessing the incident cases of DM among JIA patients are lacking. We report two cases of boys who had these autoimmune diseases.
Case report: 1) A 10-year-old caucasian boy was diagnosed with T1DM after an episode of diabetic ketoacidosis. After the birth neonatal jaundice was diagnosed and phototherapy was performed. During childhood, the patient suffered from recurrent upper respiratory tract infections. At the age of 9, tonsillectomy was performed. The patient's mother had hypothyreosis, a brother was diagnosed with multiple sclerosis, his uncle had rheumatoid arthritis and his grandmother and great grandmother were diagnosed with T2DM. After 2 years of T1DM diagnosis, the patient complained about the swelling and tenderness of the left wrist, followed by the right third DIF joint. The results showed a positive anti-nuclear antibody (ANA2+), 3+ anti-DFS, RF was negative. Results of ultrasound showed higher synovial inflammatory infiltrate in left wrist, MRI of right DIF III joint that showed synovial inflammatory infiltrate. The patient was diagnosed with oligoarticular juvenile idiopathic arthritis. 2) An obese 14-year-old caucasian boy during the clinical examination revealed an increased BMI ratio (32.4), an excess of visceral fat and present acanthosis nigricans around the neck. The recent HbA_{1c} level was 6.3%, two-hour glucose test was 11.72 mmol/l. Autoimmune markers for T1DM were negative. The patient was diagnosed with T2DM. He was a full-term, healthy infant. During childhood, the patient suffered from recurrent upper respiratory tract infections, tonsilitis, chicken-pox disease. The patient's father, grandmother and great grandmother were diagnosed with T2DM. At the age of 16, the patient started to complain about the swelling and tenderness of the left wrist. Laboratory results showed a positive (ANA2+), 3+ anti-DFS, RF was negative. Ultrasound examination showed higher synovial inflammatory infiltrate and activity of synovium Io in left wrist ultrasound. The boy was diagnosed with monoarthritis.
Conclusions: Our both cases revealed recurrent viral infections during childhood period and later onset of DM following by arthritis. There are data indicating that viral-induced autoimmunity can be activated through multiple mechanisms of infected β cells. Future studies assessing the context of why only β cells become infected by both viruses and autoimmunity are crucial in order to shed light on the association between JIA and its related-endocrinopathies.
Key words: diabetes mellitus, juvenile idiopathic arthritis.

A severe course of acute lymphoblastic leukemia in a patient with Down's syndrome

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Introduction: Children with Down's syndrome are a characteristic group of inpatients of oncological departments. Risk of accurate lymphoblastic leukemia (ALL) in this specific group of patients is 24 times higher than in the case of children without Down's syndrome. It's also associated with more challenging treatment caused by higher chance of recurrence.
Case report: A 13-year-old male was admitted to a hospital because of recurring acute lymphoblastic leukemia. ALL was diagnosed in September 2016 and treated due to ALLIC 2009 protocol. The treatment was with long breaks because of many severe metabolic complications and infections. In February 2018 treatment due to protocol was ended and remission support treatment was started. In July 2018 isolate recurrence myeloid was diagnosed and chemotherapy had to be started. Once more there were severe complications – patient needed to be hospitalized in an intensive care unit. A decision was made to attempt treatment with blinatumomab. From 22nd October 2018 to 20th November 2018 first cycle of treatment was conducted which caused hematological remission. Between 5th November 2018 and 2nd January 2019 second cycle of treatment had to be carried on, and between 16th January and 13th February 2019 the patent received the 3rd 28-days cycle of blinatumomab. After that bone marrow biopsy revealed 93.6% of blastic cells – diagnosed 2nd myeloid recurrence. Due to the exhaustion of further oncological treatment options, it was decided to stop persistent therapy. The consulate decided not to resuscitate the child, qualified him for palliative treatment and decided to discontinue the use of extraordinary therapeutic methods such as intubation, respiratory therapy. The patient's condition eventually worsened and on March 22nd, 2019 at 11 am the patient died.
Conclusions: Patients with Down's syndrome are patients with special needs and untypical ways of treatment because of poorer outcome and higher relapse rates in comparison to children without Down's syndrome. Unconventional treatment regimen and the use of agents such as blinatumomab during myeloid recurrence are worth considering.
Key words: Down syndrome, ALL, blinatumomab, challenging treatment, persistent therapy, exhaustion of treatment.

A rare case of rhabdomyosarcoma in the course of neurocutaneous melanosis in a 6-month-old infant

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Introduction: Neurocutaneous melanosis is rare (frequency of 1 in 20000 live births) congenital disease and it's probably related to the abnormal postzygotic development of melanoblasts and mutations of the NRAS gene. Children with NM are at high risk for developing malignant melanoma, however there were few cases when on NM arise rhabdomyosarcoma (RMS).
Case report: 6-month-old female infant from 4th pregnancy, 4th childbirth, born in 37th week of pregnancy through Caesarean section due to pre-eclampsia. 9 in the Apgar score, 2550 g with neurocutaneous melanosis, the Dandy-Walker malformation. The child was admitted to a hospital because of a tumor in the lumbar region. State of the girl was good. Patient has extensive naevus pigmentosus with composite color, dark bronze stains and many of them on limbs, head, on lumbar region tumor 4 × 5 cm. Burdened family history: child from first pregnancy died in sixth month of age as a result of mitochondrial cytopathy. In September there has been made biopsy of the tumor in lumbar area, lymph inguinal node and bedeguar localized on left shoulder. Histopathology affirmed rhabdomyosarcoma, not otherwise specified, in inguinal lymph node – metastases of RMS. MRI revealed: head – Dandy-Walker malformation, progressing ventriculomegaly, abdomen – without any abnormalities, lumbar tumor – on level Th12/L1 – L5/S2, pathological mass of dimensions 63 × 75 × 30 mm not infiltrating on muscles, with necrosis areas and without communications with intraspinal structures, pelvis – suspicion of metastasis in many lymph nodes. Laboratory tests were without any abnormalities. In 29.10.2019 has started chemotherapy CEV with good tolerance.
Conclusions: In conclusion this case report describes a rare example of rhabdomyosarcoma (RMS) arising in neurocutaneous melanosis (NM). In most cases patients with NM have a good prognosis with just few complications, but symptomatic patients' diagnosis is far worse – more than 50% die within 3 years of displaying first neurological symptoms. In this case it is hard to determinate a prognosis because this patient does not have neurological symptoms but has rhabdomyosarcoma with inconvenient localization.
Key words: rhabdomyosarcoma, RMS, NM, neurocutaneous melanosis, the Dandy-Walker malformation.

Mycoplasma-induced mucositis in a 16-year-old male

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Introduction: *Mycoplasma pneumoniae* is one of the most common causes of respiratory tract infections, being known as an etiological factor of atypical pneumonia. In some cases, there are extrapulmonary manifestations, such as mycoplasma-induced rash and mucositis (MIRM). MIRM is a recently proposed entity for mucocutaneous rash patterns, which involves a *Mycoplasma pneumoniae* infection, mucositis and/or rash. The distinguishment of MIRM from Stevens-Johnson syndrome and toxic epidermal necrolysis was created in 2015. The aim of this study is to increase awareness of this condition.
Case report: We report an uncommon case of a 16-year-old male with atypical pneumonia, dyspnoea, and erosive mucositis of the oral cavity. On admission, the patient's general condition was moderate, he had toxic appearance and required oxygen therapy, tachypnoea and bilateral crepitations were reported. There was bloody-mucosal discharge from the nasal cavity. Painful, fibrous erosions were visible on the oral mucosa. Conjunctivitis and intensified skin dermographism were noted. No other abnormalities were found. Laboratory tests have shown an increase in inflammatory markers (CRP 78.8 mg/l), hypoalbuminemia and lymphocytopenia. Tests for atypical pneumonia infections (*Mycoplasma pneumoniae*, *Chlamydia pneumoniae*), blood cultures, and PCR to detect CMV, EBV, HHV 6, 7, 8, and adenoviruses were performed. HIV test was negative. No history of drug or medicine consumption was noted. The treatment with ceftriaxone and clarithromycin, fluconazole and local treatment of the oral changes was started from the beginning. The patient required passive oxygen therapy, albumin transfusions and intravenous fluids. The results for *Mycoplasma pneumoniae* were as follows: IgM > 27 index, IgG 84 AU/ml. The diagnosis of MIRM was made. The patient was discharged home in a good condition.
Conclusions: Mycoplasma-induced rash and mucositis is quite a new disease entity. The awareness of this condition and distinction between MIRM and other types of erythema multiforme is crucial, because it simplifies the diagnostic process and helps to avoid unnecessary treatment.
Key words: *Mycoplasma pneumoniae*, mucositis, MIRM, erythema multiforme, respiratory tract infections, pneumonia, atypical, pediatric, male.

8 years old girl with neurocutaneous melanosis in association with giant congenital melanocytic nevi: a case report

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Introduction: Neurocutaneous melanosis (NCM) is a rare (1-9 : 100 000) congenital neurological disorder associated with large or giant congenital melanocytic nevi (CMN) or CMN with multiple satellite nevi. NCM should be suspected when a patient presents with CMN and is diagnosed when there are lesions in the central nervous system (CNS). NCM can be asymptomatic or present as variably severe and progressive neurological impairment. According to literature the prognosis is very poor when the CNS is involved.
Case report: A girl was born in 2011 from 6th pregnancy, 3rd labour, at 41 weeks of gestation. Apgar score 8/8/9. Approximately 80% of her skin was covered with various coloured hyperpigmented lesions. Giant melanocytic nevus on her lumbar region, hips and lower abdomen was present as well as numerous satellite lesions on the torso, limbs, face and head. Cerebral MRI revealed cavernous malformations. The lesions were hyperintense on T1, T2 and FLAIR. There was no contrast uptake. After MRI examination the diagnose was clear – neurocutaneous melanosis. Several skin biopsies were performed at the age of 7 months, pathological examination – mixed pigmented nevi, no data of malignancy. Until now patient has had 3 nevus excisions (facial region), 2 two-stage operations with Integra dermal regeneration template with a thin split-thickness skin transplant and dermabrasions of 5 pigmented nevi. Last cerebral MRI examination on 2019 revealed cerebral venous angioma in the left frontal lobe (with contrast uptake). Compared to the previous investigation (2012), there were no hyperintense structures on T1. Girl is now 8 years old and so far, no physical or neurological delay in development has been observed.
Conclusions: A multidisciplinary approach to patients with NCM is imperative and should consider routine neurodevelopmental assessments along with dermatological examinations as up until now no guidelines have been developed on how to manage this disease. Despite expected poor prognosis, this patient serves as evidence that each case is individual and that this rare disease requires further investigation to determine its course and prognosis.
Key words: paediatrics, neurocutaneous melanosis, melanocytosis, nevus.

Individualised biopharmaceutical treatment of a 4-month-old girl with atypical course of Kawasaki disease – case report

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Introduction: Kawasaki disease (KD) is an acute vasculitis of unknown cause that typically affects children between 6 months and 5 years of age. The essential symptom of KD is persistent, high-grade fever, but other distinctive symptoms include rash, oral and extremity changes, conjunctivitis and cervical lymphadenopathy. Aneurysms are a common complication and their development on coronary arteries is the leading cause of acquired heart disease in children. Intravenous immunoglobulin (IVIG) and acetylsalicylic acid (ASA) treatment is preferred, often with an addition of steroids.
Case report: In this study, we present a case of a 4-month-old girl who was admitted to a hospital with suspicion of upper respiratory tract infection. Broad-spectrum antibiotics and acyclovir were introduced but made no expected impact. Due to persistent fever a portion of IVIG was administered and emerging rash resulted in addition of steroids, with immediate good effect. Unfortunately, soon the fever recurred. ECHO revealed massive aneurysms of coronary arteries: LCA (5 mm), LAD (3.9 mm) and RCA (4.4 mm). KD was diagnosed and standard therapy with IVIG and ASA was implemented. 4 days later symptoms of ischaemia in the right foot appeared, soon followed by necrosis of the distal part of the toes. Treatment proved ineffective and the patient was referred to The Children's Memorial Health Institute in poor general condition. Patient presented with an advanced hepatosplenomegaly, fluid in pericardium and oedema of the eyelids and the extremities. 3-day corticosteroid therapy was introduced as well as furosemide, albumins and chimeric monoclonal antibody Infliximab. Patient's general condition was steadily improving, yet the phalangeal necrosis progressed, shortly resulting in separation of tissues and necrotic changes. ECHO showed a thrombus in aneurysm of LAD, but Actylise treatment caused its full reabsorption.
Conclusions: Fever that does not respond to medication might indicate a serious underlying condition. Incident of an atypical course of Kawasaki disease must be recognized, as it might not respond to a regular treatment. In this case, only individualized biopharmaceutical treatment brought the expected effect.
Key words: Kawasaki disease, pediatrics, vasculitis, biopharmaceutical treatment.

Pompe disease in the newborn boy

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Introduction: Pompe disease also known as glycogen storage disease type II is ultrarare condtition caused by deficit of enzyme acid α-glucosidase (GAA). This disease manifest itself in infants with hypertrophic cardiomyopathy, prominent hypotonia, psychomotor delay and feeding problems.

Case report: Newborn boy was admitted to hospital because of hypertrophic cardiomyopathy, tongue enlargement, feeding problems, hepatomegaly and mild laxity of muscules. The obstetric interview revealed hypertention. During the submission the child was in good general condition. The laboratory tests has shown elevated level of transaminase, creatine kinase and hyperbilirubinaemia. ECHO has confirmed the hypertrophic cardiomiopathy. The level of NT-proBNP and troponins was raised, but troponins were showing tendency to fall. The screening test for hypothyroidism was made and the result was possitive. The endocrinological consultation was commissioned and treatment with levothyroxine has been started. Although, the congenital hypothyroidism was taken into consideration, the decision of testing GAA activity in dry drop of blood was made. The enzyme activity was below the cut off value that suggested Pompe disease. To confirm diagnosis the genetic test towards Pompe disease was conducted. The result has shown homozygous mutation and loss of function of GAA. The decision about treatment with Myozyme – a recombinant formulation of the human GAA was made. After diagnosis parents started to research their families and it turns out that they are related in sixth line.

Conclusions: Considering Pompe disease it is important to make a quick diagnosis and start treatment as soons as it is possible. In case of infant type, treatment is the procedure that directly saving lives. First diagnosis can poses a challenge. Considering congenital hypothyroidism and Pompe disease the symptoms are similar, however high level of troponins and hypertrophic cardiomyopathy are more characteristic for Pompe disease. In Poland, there is available fully refunded causal treatment with enzyme replacement therapy. It extends life and period without mechanical ventilation, decreases heart mass and improves motor development.

Key words: Pompe disease, newborn, pediatric, hypertrophic cardiomyopathy, GAA.

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Treatment of posterior cerebral circulation aneurysms with flow diverter (FD) stents

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Introduction: Treating cerebral aneurysms located in posterior circulation is associated with particular difficulties. Implantation of FD stents into basilar artery due to its anatomy (many perforators providing blood flow to crucial parts of brain: brain stem and hypothalamus) may be associated with higher risk of ischemic complications.
Aim of the study: The aim of the study was to evaluate the safety and efficiency of flow diversion therapy in treatment of posterior cerebral circulation aneurysms.
Material and methods: 20 of the patients (10 males and 10 females) with 20 aneurysms located in posterior cerebral circulation were treated with flow diverter stents. The mean age in that group of patients was 48.15 ± 14.93. Aneurysms were located in vertebral artery (VA) (*n* = 9, 45%) basilar artery (BA) (*n* = 5, 25%), posterior inferior communicating artery (PICA) (*n* = 6, 30%). Mean height and width of treated aneurysm were 9.55 ± 8.49 mm and 7.41 ± 5.25 cm respectively. In 6 aneurysms SILK (Balt, France) stents were implanted, in 13 FRED (MicoVention Terumo, US), and in 1 P64 (Phenox, US). 6 patients had subarachnoid hemorrhage and were treated in acute phase of disease. The aneurysms were evaluated with DSA (Digital Subtraction Angiography) and in follow-up group (7 cases) with DSA, MR angiography and CT angiography. The presence of complications such as ischemic stroke or TIA has been evaluated by neurological examination and computed tomography (CT).
Results: The full occlusion of the aneurysms (grade 4 in Karman scale) was obtained in 1 patient (5%) immediately after the procedure. In the follow-up 4 patients (57.14%) had total occlusion of aneurysms (grade 4). There was 1 case (5%) of stent displacement. There were 2 (10%) cases of death after procedure (both associated with previous subarachnoid hemorrhage).
Conclusions: Aneurysms located in posterior cerebral circulation remain therapeutical challenge. Our findings suggest that their treatment with flow diversion is safe. There were no neurological complications.
Key words: aneurysms, posterior cerebral circulation, flow diverter stents.

The MRI imaging of marrow oedema of sacroiliac joints in children

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Introduction: The structure and orientation of sacroiliac joints (SIJ) is very challenging for imaging and interpretation especially in children. Magnetic resonance imaging (MRI) is the method of choice as manifestations of sacroiliitis can be seen, including bone marrow oedema.
Aim of the study: The aim was to evaluate the additional value of contrast-enhanced sequences in comparison with diffusion-weighted imaging (DWI), short tau inversion recovery (STIR) in imaging marrow oedema of SIJ in children.
Material and methods: In the analyzed group there were 26 females and 27 males (mean age 15.15 ± 1.7). Examinations were performed with 3.0 T MRI scanner. Both SIJs were imaged from the anterior to the posterior border in the coronal oblique plane, parallel to the long axis of the sacral bone. Such sequences were evaluated: STIR, T1-weighted sequence, DWI sequence, contrast enhanced T1 sequence, T1+contrast perfusion. The images were assessed by an experienced radiologist and by an independent observer. In every sequence five sections with the longest visible part of the SIJ articular surface were chosen. On every section, each SIJ was divided into four quadrants analyzed for the presence of bone marrow oedema.
Results: The sensitivity and specificity for the non-contrast enhanced sequences were as follows: for DWI 0.63 (95 CI: 0.38-0.84) and 0.97 (95 CI: 0.85-0.99) respectively, for STIR 0.68 (95 CI: 0.43-0.87) and 0.97 (95 CI: 0.85-0.99). Those parameters for contrast enhanced sequences were as follows: for contrast enhanced T1 0.74 (95 CI: 0.49-0.91) and 0.94 (95 CI: 0.80-0.99), for T1+ contrast perfusion 0.79 (95 CI: 0.54-0.95) and 0.94 (95 CI: 0.80-0.99). DWI as well as STIR have higher specificity but lower sensitivity than sequences with contrast agents. Those differences are not statistically significant (the highest differences were between DWI vs. T1 THRIVE: sensitivity P = 0.25, specificity P = 1). STIR and DWI together had sensitivity 0.74 (95 CI: 0.49-0.91).
Conclusions: DWI and STIR together had the sensitivity as high as that in contrast enhanced T1 sequence. Contrast enhanced sequences are associated with higher health costs, so due to our findings, it is more reasonable to use DWI and STIR and obtain comparable results.
Key words: MRI, sacroiliac joints.

Ischemic complications after cerebral aneurysm treatment with flow diverter stents

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Introduction: Safety of flow diversion has been proven, but this technique is associated with specific technical difficulties and slightly higher complication rate than other available treatment alternatives (regular stent and coiling). As a relatively new novel technique flow diversion is still examined to establish its thorough indications, safety and efficiency.
Aim of the study: The aim of this study was to evaluate the rate of ischemic complications after flow diversion therapy.
Material and methods: There were 129 patients (100 females, 29 males) with 129 intracranial aneurysms treated with flow diverter stents. Mean patients' age was 53.76 ± 14.02 years. Aneurysms were located in: ICA (95 – 73.64%),

VA (9 – 6.98%), BA (5 – 3.87%), MCA (4 – 3.1%), AcomA (5 – 2.98%), PICA (6 – 4.65%) and other localizations (5 – 3.87%). 59 aneurysms were treated with SILK flow diverter (SFD), 65 with Flow Re-Direction Endoluminal Device (FRED™) and 5 with p64 Flow Modulation Device. Length of devices varied from 15 mm to 39 mm and diameter from 2 mm to 5 mm respectively. 8 aneurysms were ruptured and treated in acute phase of SAH. The aneurysms were evaluated with DSA (digital subtraction angiography) and in follow-up group (78 cases) with DSA, MR angiography and CT angiography. The presence of complications such as ischemic stroke or TIA has been evaluated by neurological examination and computed tomography (CT).
Results: Full occlusion (grade 4 in Karman grading scale) was obtained initially in 8 cases (6.20%) and in the follow-up group in 59 cases (75.64%). Temporary neurological deficits were observed in 4 cases (3.1%), they were not associated with any flow disturbances in DSA examination. Permanent neurological deficits after procedure were observed in 4 cases (3.1%): 2 cases after partial stent thrombosis, in 1 case after displacement of FD stent. In 3 cases ischemic complications appeared in patients with SAH and were not associated with endovascular procedure (2 cases of death due to brain damage, 1 case of permanent neurological deficit).
Conclusions: Flow diversion is safe and effective in treating cerebral aneurysms. Permanent neurological complications are rare.
Key words: flow diversion, aneurysm, ischemic complications.

Can body fat thickness be a limitation factor in emergency needle cricothyrotomy/ needle cricothyrotomy?

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Introduction: Emergency cricothyrotomy is a technique of surgical management of airway patency when classical methods have failed. Paramedics in the Polish emergency system are allowed only to perform the needle cricothyrotomy (eg the "Quick Trach" set).
Aim of the study: The aim of the study is quantitative assessment and determination of the border point for the sagittal dimension of the location dedicated to the cricothyrotomy/needle cricothyrotomy emergency procedures ("Cric").
Material and methods: 600 computed tomography (CT) images of neck were evaluated. To assess the depth of the "Cric" sets in the airways, the following indicator was calculated: percentage of airway cavity – length of airway trocar/airway diameter × 100%. The results were compared to the maximum depth of application using a universal kit dedicated for adults "Quick Trach" (3 cm) and a tracheostomy tube (4.5 cm) – size 7.
Results: There were 300 women and 300 men (mean age 57.15 ± 16.77 years). The distance from the skin surface measured at the level of the lower edge of the thyroid cartilage to the cricothyroid ligament was on average 1.59 ± 0.80 cm. In 36 cases (6%) the distance exceeded the depth of the tube from the "Quick trach" set. In 15 cases (2.5%) the distance exceeded 3.5 cm. In 2 cases (0.33%) the distance exceeded the size of the tracheotomy tube. The average diameter of the respiratory tract measured from the cricothyroid ligament to the posterior wall of the subglottic region of larynx was 2.1 ± 0.50 cm. The percentage of airway cavity was less than 10% in 55 cases (9.17%). Men have statistically significantly wider airways ($p < 0.001$).
Conclusions: The percentage of the population in which the distance between the cricothyroid ligament and the skin exceeds the length of the emergency needle cricothyrotomy tool ("Quick trach") was estimated at 6% and 0.33% for the tracheotomy tube. Too thick layer of fatty tissue makes it difficult to perform a surgical procedure to keep airway patency. In 1/17 cases an alternative to current methods may be useful. It should be considered to grant additional rights to paramedics in countries where they do not have legal competence to perform cricothyrotomy combined with prior dissection of the cricothyroid ligament.
Key words: cricothyrotomy, Quick Trach, body fat, CT.

Intracranial hemorrhage detection using advanced machine learning algorithms

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Tutors: dr hab. inż. Łukasz Pieczonka, prof. AGH, dr hab. inż Piotr Kohut, prof. AGH

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Introduction: Intracranial hemorrhage (ICH) is considered as the one of the most devastating neurological disease type with the overall incidence of 24.6 per 100,000 person-years. It is well known, ICH has substantial public health impact. The reported rate of 30-day mortality ranges from 35% to 52%, with only 20% of survivors expected to have full functional recovery after 6 months. Only prompt diagnosis with induction of proper treatment according to the type of ICH may lead to the increase of patients' survival rate.We hypothesized that machine learning algorithms could automatically analyze computed tomography (CT) of the head, prioritize radiology worklists and reduce time to diagnosis of ICH.
Aim of the study: In order to classify type of ICH, based on DICOM files, the advanced Machine Learning methods have been implemented.
Material and methods: In our study we analyzed 874 031 CT scans of the brain.We determined 5 types of ICH : epidural hematoma, subdural hematoma, subarachnoid hemorrhage, intraparenchymal hemorrhage and intraventricular hemorrhage. Our algorithm is based on one of the state-of-the-art convolutional neural networks (CNN) architecture, EfficientNet. EfficientNet has been developed by the years of modern CNN research. Our database contains 752 799 unique records in train set, and 121 232 unique records in test set. In order to detect the probability of IH subtype based on DICOM file we used EfficientNet with different set up values. EfficientNet exists in eight architectures, differing by the values of width, depth and resolution of implemented network. Each of this value defined the computer resources reserved for model training.

Results: As the results we achieved the accuracy score depends on number of epochs and loss function values depends on number of epochs. Moreover, the array with probability of Intracranial Hemorrhage subtypes occurrence was generated. We achieved 87% accuracy score and the loss function value was 0.8.
Conclusions: Our results showed that CNN might be implemented to detect ICH with good accuracy. Implementation of MLA allows us to detect ICH earlier, ultimately leading to improved clinical outcomes. Such a quality improvement tool could be used to automatically manage the priority for interpretation of imaging studies with presumed ICH and help optimize radiology workflow. Solution we came up with (using EfficientNet in IH detection task) is one of the first around the world. The traditional CNN has been used so far. During this work we propose a little different solution, which improved our results.
Key words: machine learning, DICOM, intracranial hemorrhage, EfficientNet, CNN.

Histopathologic cancer detection with artificial deep neural networks

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Introduction: The rapid increase in development of deep learning techniques and algorithms, related with impactful medical data share, have opened new opportunities for scientists to implement artificial intelligence systems which can empower multiple fields of medicine. During this work, we decided to implement an algorithm capable of tumor tissue detection.
Aim of the study: In our study we differentiated cancer cells from non cancer cells on the histopathological samples of tissues obtained from biopsy procedure. We implement set of algorithms capable of detecting areas affected by tumor on histopathological samples.
Material and methods: We analyzed 57 458 labeled histopathology samples, with and without neoplasms and developed a tool for classifying samples affected with cancer. For the classification problem a convolutional neural network was used with Efficientnet-b2 architecture as a base. Efficientnet algorithm family is known for its superior prediction accuracy to efficiency rate. Our next step was the implementation of an algorithm to more precisely detect affected areas without extensive data labeling process needed for segmentation. For this purpose we used the LIME prediction explainer algorithm. This helped us understand decisions made by the neural network, as well as give the deeper insights of the problem. After all, we had to deal with the different size of input data. We decided to use the chunking algorithm to crop input data into a set of smaller one, compatible with the training size.
Results: After extensive training, the error rate for prediction of cancer occurrence achieved the value around 0.8. The accuracy score in the best result achieved 98%, in the same time, the validation accuracy achieved 97%. These results were achieved on the original dataset.
Conclusions: Implementation of the ANN and other machine learning methods can bring a big positive impact on the medicine. The most valuable aspects of implementing automated diagnosis tools are high reliability, quick diagnosis, over human accuracy and wide accessibility. We believe that bringing these values to the medical market can empower doctors, leveraging their skills to bring cancer detection into a new level, having an impact on the global scale. Our diagnosis tool contains simple in usage, yet powerful end-to-end set of algorithms allowing for detecting cancer in histopatologic samples obtained in different conditions, with no need for previous data unification process.
Key words: ANN, machine learning, neoplastic tissue detection.

Telemedicine and neurosurgery: a single institution experience

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Introduction: Telemedicine is the use of telecommunications technology to provide health care services to persons who are at some distance from the provider.
Aim of the study: The aim of the study is to examine how teleconsultations can improve faster healthcare provision and avoid unnecessary transfers of neurosurgical patients.
Material and methods: Data on telemedicine consultations from CGM NETRAAD system in 2019 was collected retrospectively and studied using statistic methods. The impact of consultations on admission was analyzed.
Results: The study group consisted of 149 patients (mostly male, 61.7%; median age 67 years; range, 15-96 years). Subdural hematomas and brain tumors were the most common reasons of consultations (59.7% vs. 20.8%). Median time of response to teleconsultation was less than 2 h and was determined by patient's condition. 38% of patients remained at the referring hospital for further observation and did not require transfer to a trauma center. One-third of patients required immediate neurosurgery intervention. In 16 cases out of 149 further imaging such as MRI/angio-CT were needed. Qualified staff have saved approximately 124 km per each patient for transfer (outward and return) due to teleconsultation.
Conclusions: Telemedicine for neurosurgical patients can be an effective service in consultations, it prevents unnecessary transfers to trauma center, and saves resources.
Key words: telemedicine, teleconsultations, neurosurgery, CGM NETRAAD.

Safety and effectiveness of the use of flow diverter stents for adjunctive treatment of cerebral aneurysms previously treated with other stents

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Introduction: One of the new techniques used for treating intracranial aneurysms with endoluminal devices is flow diversion (FD) therapy. Flow diverter placed before the neck of aneurysm, diverts blood flow, so that it skips its lumen and that results in decreased flow into the aneurysm. The 'diverter in stent' technique (DiST) is a way of adjunctive treatment with FD device being implantedinto the vessel with aneurysm previously treated ineffectively with other stent.
Aim of the study: The aim of the study was to evaluate the safety and efficiency of the 'diverter in stent' technique in adjunctive treatment of intracranial aneurysms.
Material and methods: There were 159 patients with 168 intracranial aneurysms treated with FD.10 of them were ruptured and treated in acute phase of SAH. 16 of aneurysms, recanalized after previous stent assisted coiling procedure, weretreated with 'diverter in stent' technique. There were 5 men and 11 women, the mean age was 55.5 ± 14.15. The follow-up group consisted of 105 cases, 11 of which had been treated with 'diverter in stent' technique. The aneurysms were evaluated with DSA (digital subtraction angiography) and in follow-up with DSA, MR angiography and CT angiography.
Results: The complications after treatmentin group treated with 'diverter in stent' technique were as follows: acute thrombosis in stent (n = 1, 6.25%), flow reduction in the parent artery (n = 1, 6.25%), incomplete FD expansion (n = 1, 6.25%). No neurological deficits were observed. 1 patient with SAH died. In the follow-up of this group full occlusion (grade 4 in Karman grading scale) was obtained in 9 cases (81.82%). In the control group (n = 152) the complications after treatment were as follows: acute thrombosis in stent (n = 6, 3.9%), flow reduction in the parent artery (n = 4, 2.6%), incomplete FD expansion (n = 8, 5.3%), stent displacement (n = 8, 5.3%). 9 (5.92%) patients had permanent neurological complications. 1 patient with SAH died. In control follow-up group (n = 94), the total occlusion (grade 4) was obtained in 70 aneurysms (77.5%).
Conclusions: The 'diverter in stent' technique is effective in the treatment of intracranial aneurysms. Diverter in stent implantation does not increase the risk of neurological complications.
Key words: flow diverter, intercranial aneurysms.

The treatment of tandem aneurysms with flow diverter therapy

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Introduction: Tandem aneurysms are rare vascular lesions that are described as thepresence of 2 or more aneurysms in close proximity to each other on theparent vessel. They are challengesfor surgical and endovascular treatment.
Aim of the study: The aim of the study was to evaluate the safety and efficiency of flow diversion therapy in treatment of tandem aneurysms.
Material and methods: 15 of the patients (14 women and 1 man) with tandem aneurysms were treated using flow diverter stents.2 patients had 3 aneurysms and 13 patients had 2 aneurysms. All aneurysms were located on internal cerebral artery. The mean age in that group of patients was 50.2 ± 13.05. In 10 cases SILK (Balt, France) stent was used and in 5 cases FRED (MicoVention Terumo, US) stent was implanted. Follow up group consisted of 9 patients.
Results: The full occlusion of the aneurysms (grade 4 in Karman scale) was obtained in 2 patients (13.33%) immediately after the procedure. In the follow-up 8 patients (88.89%) had total occlusion of all aneurysms (grade 4). 1 patient (6.67%) with SAH had acute in-stent thrombosis, treated with Abciximabum (ReoPro) i.v. injection. Despite the treatment, patient ended up with permanent neurological deficit.
Conclusions: According to our study, the treatment of tandem aneurysm with FD therapy is effective and safe. Further studies on larger group of patients need to be conducted.
Key words: flow diverters, tandem aneurysms.

Analysis of the ultrasound image of thyroid nodules in different types of thyroid neoplasms

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Introduction: Thyroid cancer is the most common endocrine malignancy. In ultrasound assessment (USG) of thyroid nodules the TIRADS scale (based on most significant features of malignancy) is commonly used. Thyroid cancers include papillary thyroid cancer (PTC), follicular thyroid cancer (FTC), medullary and anaplastic cancers. Nodules can also contain a benign tumor – a thyroid adenoma.
Aim of the study: The aim of the study was to evaluate the USG features of neoplastic thyroid nodules, analyze them with respect to their histopathological type and asses applicability of EU-TIRADS scale.
Material and methods: Our study took into account 188 patients with suspected/confirmed thyroid malignancy. Each patient underwent thyroid USG, in which suspicious nodules were described, and then thyroidectomy. Histopathological results confirmed the type of tumor in each patient. Hence descriptions of neoplastic nodules of confirmed type were analyzed.
Results: In PTC, most of the 130 patients had hypoechoic (86.1%), solid (93.1%) nodules that varied in shape. 34% had microcalcifications. 51.5% had peripheral vascularity pattern. Only in 7.7% suspicious pathological lymph nodes were seen. 91.5% of nodules scored 5 in TIRADS. In FTC, most nodules in 24 patients were hypoechoic (83.3%), solid (79.2%) of mostly round (58.3%) shape. 41.7% of nodules had a peripheral halo of decreased echogenicity and 16.7% had microcalcifications.

54.1% had peripheral vascularity pattern and 29.2% presented capsular bulging. 79.2% of nodules scored 5 in TIRADS. Medullary cancers (8 patients) were mostly hypoechoic, solid, with variety of shapes. 50% of them had halo effect and microcalcifications. 62.5% presented intranodular vascularity pattern. All nodules scored 5 in TIRADS scale.

Conclusions: Most of neoplastic nodules were described as hypoechoic and solid. Many presented alarming features like peripheral halo or microcalcifications. Non-medullary neoplasms had peripheral vascularity pattern, which can be wrongly interpreted as a calming sign during estimation of potential malignancy. The assessment of traits included in TIRADS scale is crucial to the diagnosis of thyroid neoplasms, as it allows to correctly predict the character of suspicious nodule.

Key words: thyroid cancers, thyroid ultrasonography, thyroid nodules, EU-TIRADS.

Internal Medicine Case Report

Jury:
Prof. Jacek Czepiel MD, PhD

Coordinators:
Olaf Chmura, Jan Koper

List of papers:

Pulmonary embolism in female patient with multiple risk factors

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Introduction: Pulmonary embolism (PE) is third most common cause of death in highly developed countries. Thrombophilia, in particular, genetically determined, causes predisposition to thromboembolic disorders. Thoracic outlet syndrome creates excessive pressure on the neurovascular bundle.
Case report: 21 years old female patient complaints on shortness of breath and clenching pain in left part of chest, which irradiates in left supraclavicular region, raising the temperature to 38°C, unproductive cough. Complaints were gradually increasing during 5 days. For 6 years – dysmenorrhea with menorrhagia, while oral contraceptives (OC) intake. She was hospitalized with preliminary diagnosis "Community-acquired left-sided pneumonia" and received antibacterial therapy. On third day single episode of hemoptysis occured. CT scan: massive thrombotic formations in branches of pulmonary artery mainly in the inferior branch with the identical formations in inferior branch of left pulmonary artery, with distribution to segmental branches bilaterally. Conclusion: PE with bilateral pulmonary infarction. Direct anticoagulants were prescribed – Rivaroxaban 15 mg twice per day for 3 weeks, after that 20 mg every day. Gynecologist recommended to cancel intake of OC. Positive signs of thoracic outlet syndrome were revealed. Ultrasonography revealed zone of segmental thrombosis of posterior-median veins in shoulder region of left upper extremity. Vascular surgeon recommended correction of mechanical obstruction. Blood analysis: moderate grade anemia – Hb 85 g/l, ANA – 1 : 320 (N – 1 : 100), positive result. Genetic testing for thrombophilia mutations: Factor I and MTHFR genes polymorphism. In 35 days PE relapse occurred on the background of anticoagulants intake and normal levels of D-dimer PE. Treatment by apixaban (10 mg per day) is performed with positive dynamics.
Conclusions: Feature of this case in a combination of multiple PE risk factors: thrombophilia, OC intake, thoracic outlet syndrome; the complexity of treatment tactics for preventing relapse of venous thrombosis of women with menorrhagia.
Key words: pulmonary embolism, thrombophilia, thoracic outlet syndrome.

Calciphylaxis

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Introduction: Calciphylaxis is a rare cutaneous-systemic disorder which can develop for the patients with advanced chronic kidney disease. I present you a clinical case of 59-year-old woman who was diagnosed with calciphylaxis and got significantly better after parathyroidectomy was performed.
Case report: A patient has polycystic kidney disease and is in hemodialysis for 7 years. 5 years ago, she has undergone nephrectomy and is suffering from secondary hyperparathyroidism. Woman complains about weakness and occasional fever as well as pain, bruises and lesions which appeared on both legs and abdomen. The lesions progressed into painful necrotic ulcers with palpable masses. Large nodules above the tissue of both shoulders were present. The patient was hospitalized in Nephrology station. Laboratory investigation showed elevated plasma levels of phosphate, calcium, parathormone, C-reactive protein. Local antiseptics and antibiotics were prescribed for the care of ulcers; as well as pain killers at nights. Roentgenograms showed 7 cm (left) and 2 cm (right) diameter soft tissue calcifications above the shoulders; resorption of humerus; significant osteoporosis of hand bones and angiocalcinosis. Cysts with calcinates in liver and enlarged uterus with calcified nodules on ultrasound exam were detected. On the ultrasound test of the thyroid gland hypoechogenic nodules in parathyroid glands were visible and biopsy of the tissue confirmed nodular hyperplasia of parathyroid glands. Parathyroidectomy with one parathyroid gland autotransplantation was performed. After the operation calcium and parathormone decreased, pain of the ulcers disappeared, masses around the ulcers and above shoulder decreased in size significantly.
Conclusions: Calciphylaxis was diagnosed based on clinical, laboratorial and radiological symptoms. General condition of the patient got significantly better after parathyroidectomy.
Key words: calciphylaxis, calcific uremic arteriolopathy, parathormone.

AL amyloidosis

Dovilė Meidutė

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Introduction: Amyloidosis is a group of diseases in which an insoluble protein called amyloid is accumulated in various tissues in the body. This substance can accumulate in the heart, liver, kidneys, spleen, and brain. The risk of illness increases with age, primarily due to the increasing incidence of monoclonal gammopathy of uncertain significance. The prevalence of AL amyloidosis is 1-5/10 000. Here, I report a clinical case of 71-year-old man who has been diagnosed with heart amyloidosis.
Case report: In 2015, a patient was diagnosed with monoclonal gammopathy of uncertain significance. In 2016, magnetic resonance imaging was performed and it showed pronounced left ventricular hypertrophy and a diffuse accumulation in the myocardium. In 2017, a cardiac endomyocardial biopsy was performed and histologically non-AA cardiac amyloidosis was confirmed. During the time it took for all additional testing, patient developed a complete atrioventricular block and was implanted with a dual-chamber cardioverter-defibrillator. The definitive diagnosis was confirmed to be myeloma with associated AL amyloidosis. The patient received 3 courses

of cyclophosphamide, thalidomide and dexamethasone (CTD) chemotherapy, however a minimal response was obtained. The second-line treatment was 4 chemotherapy courses of cyclophosphamide, bortezomib and dexamethasone (CyBorD) in combination with doxycycline until July 2018. In the absence of bone marrow infiltration, it was decided not to use autologous stem cell transplantation and to end the treatment, except for long-term use of doxycycline. Patient is still under continuous observation, showing slight increase in M gradient with no indications for systemic treatment.
Conclusions: Isolated cardiac amyloidosis with no evidence of systemic organ involvement is extremely rare and may require magnetic resonance imaging and endomyocardial biopsy to confirm the diagnosis. Amyloidosis can be treated with similar regimens as for multiple myeloma, preferably combinations including bortezomib in order to inhibit the activity of pathological protein-producing cells.
Key words: amyloidosis, amyloid, chemotherapy, treatment.

Long QT syndrome, type 2

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Introduction: The congenital long QT syndrome (LQTS) is a life-threatening cardiac arrhythmia syndrome which represents a leading cause of sudden death in the young. LQTS is typically characterized by a prolongation of the QT interval on the electrocardiogram (ECG) and by the occurrence of syncope or cardiac arrest, mainly precipitated by emotional or physical stress. I present you a clinical case of 45-year-old man who has been diagnosed with long QT syndrome, type 2.
Case report: When the patient was in the mountains, he suddenly felt short of breath, but symptoms quickly disappeared. The next day, he suddenly lost consciousness. The patient's wife claims to have seen foam running out of husband's mouth. In the emergency room, the patient was hemodynamically stable but complained of mild depressing pain in the heart area. 12 lead ECG showed presence of long QT interval of 604 msec; troponin assay was performed 3 times: 5.6-32-38 ng/l. Genetic testing was performed and showed pathogenic mutation of KCNH2 gene. After 2 days in the hospital, the patient suddenly became unconscious again, developed convulsions and muscle tension, but quickly regained consciousness. Sinus rhythm, ventricular and supraventricular extrasystoles were observed on the monitor. The patient was implanted with a cardioverter-defibrillator. There were no more episodes of unconsciousness or arrhythmia. Patient is still under continuous observation and examination.
Conclusions: The congenital long QT syndrome is caused by mutations in genes encoding cardiac ion channels which result in prolongation of ventricular action potential. Genetic screening of symptomatic patients or their asymptomatic family members may identify patients at risk for life threatening arrhythmias and the type of long QT syndrome as it has important implications in the management.
Key words: congenital long QT syndrome, QT interval, genes, mutation, prolongation.

Clear cell renal cell carcinoma metastases 13 years after a nephrectomy in a patient with multiple endocrine neoplasia type 1

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Introduction: Multiple endocrine neoplasia type 1 (MEN1) is a rare, autosomal dominant inherited syndrome caused by mutations in the menin tumor suppressor gene. The disease is characterized by the presence of pancreatic, parathyroid, and anterior pituitary tumours. We describe the case of a patient who presented with classic history and imaging findings for MEN1 with additional clear cell renal cell carcinoma (ccRCC) metastases 13 years after a nephrectomy.
Case report: A male in his early fifties, with medical history of ccRCC treated surgically, was admitted to the neurology department because of recurrent disturbances of consciousness, diaphoresis and visual impairment. Serum glucose level was decreased. Head MRI demonstrated a large: solid, calcified, necrotic mass within sellar fossa and suprasellar cistern. Subsequently, the patient was admitted to endocrinology department for further evaluation. The computed tomography (CT) of the abdomen, pelvis and thorax demonstrated four hyperenhancing pancreatic masses consistent with neuroendocrine tumors. Two enlarged lymph nodes adhering to inferior vena cava and bilateral adrenal tumors were also identified. Chest CT showed several small hyperdense nodules in left lung and a tumor located in anterior and middle mediastinum. The 72-hour fasting test was indicative of insulinoma. Based on laboratory testing, nonfunctioning adrenal tumors, as well as primary hyperthyroidism and prolactinoma with secondary hypothyroidism and hypogonadism, were diagnosed. Based on these findings diagnosis of MEN1 syndrome was made. The diagnosis was confirmed by genetic testing. The patient underwent a few surgeries due to multiple tumors. Firstly, laparoscopic right adrenalectomy was performed. Next he underwent resection of lung nodules and mediastinal tumor. Pathology revealed pulmonary ccRCC metastases (13 years after a radical nephrectomy), and a borderline thymoma respectively. Sunitinib therapy was introduced, with partial remission of the remaining ccRCC lung metastases, and resolution of the hypoglycemia. Pituitary tumor is controlled with medical therapy (bromocriptin), and the mild hypocalcemia is followed without any pharmacological treatment. In 2017 he was reoperated due to recurrent thymoma.
Conclusions: We report a case of a classical presentation of MEN1 syndrome with tumors in all 3 defining endocrine organs. Moreover, we want to stress the need for oncological awareness in such patients, as not related to the endocrine organs malignancies, may arise. Regular follow up and multidisciplinary approach, are crucial.
Key words: clear cell renal cell carcinoma, multiple endocrine neoplasia type 1, Wermer syndrome.

ANCA-associated vasculitis – is it still a diagnostic and therapeutic challenge?

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Introduction: The aim of the study was to describe the rare case of vasculitis with the presence of ANCA antibodies in a 36-year-old woman. ANCA associated vasculitis is a rare and heterogeneous group of diseases. It can occur at any age, but more often it affects adults and the elderly. In the course of the disease, the involvement of organs such as the lungs and kidneys is typical. It is usually manifested by progressive deterioration of renal function, which may lead to terminal renal failure. The clinical presentation is characterized by the occurrence of general, muscular-joint, neurological and skin symptoms. The study analyzes the case of a patient who has developed the above disease entity.
Case report: The disease was manifested in the form of arthritis with tenderness of the muscles of the lower legs, increasing dizziness, disturbance of gait balance, lower limb parasthesia and skin lesions with morphology of vasculitis. Acute kidney damage occurred in the course of systemic disease. A kidney biopsy confirmed the features of scantimmune glomerulonephritis with the presence of crescents. Serological tests showed the presence of c-ANCA antibodies. Plasmapheresis with simultaneous administration of Solu-Medrol was used in the treatment. Then, intravenous immunoglobulins were started in parallel, initiating Endoxan therapy according to the EUVAS regimen. After completion of remission induction treatment, maintenance therapy with Azathioprine and then Mycophenolate Mofetil was introduced. Due to the ineffectiveness of the treatment, Rituximab was used. The therapy did not bring the expected results, therefore the patient is qualified for kidney transplantation.
Conclusions: The rarity and varied clinical course of ANCA-associated vasculitis mean that they are often overlooked in differential diagnosis in patients with symptoms from multiple organs and systems. Therefore, they constitute a significant diagnostic problem. It is important that the disease is detected as soon as possible and that appropriate treatment is started to prevent complications of the described disease entity.
Key words: ANCA-associated vasculitis, acute kidney injury, immunosuppressive therapy, rituximab.

Medullary thyroid cancer with focal lesions in the liver – various therapeutic methods

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Introduction: Medullary thyroid cancer (MTC) is a neuroendocrine neoplasm which originates from the parafollicular cells producing a hormone called calcitonin. MTC is the third most common thyroid cancer that represents about 3% of all thyroid carcinomas. Clinical prognosis of this cancer is variable and depends mainly on the age of the patient and the stage of the disease. The treatment of choice is total thyroidectomy. In a case of non-radical resection, or disseminated disease, there is no established curative therapy.
Case report: A 78-year-old patient, with medical history of breast cancer, type 2 diabetes, hypertension, and hypercholesterolemia, was diagnosed with medullary thyroid cancer of the left thyroid lobe (cT3N1bMx) in April 2017. In July 2017, thyroidectomy with a middle neck compartment and a modified left lateral neck lymphadenectomy was performed. Persistent markedly elevated levels were noted postoperatively. Post-surgery PET-CK with 68-GaDOTATOC revealed somatostatin receptor expressing focal lesions in the liver which were interpreted as metastases of MTC. The patient was qualified for vandetanib therapy. The treatment was started in March 2018, but it was discontinued after two weeks due to side effects (exacerbation of chronic kidney disease, recurrent hypoglycaemia, vertigo, diarrhea). Patient was subsequently qualified for peptide receptor radionuclide therapy (PRRT), and received three cycles of 100 mCi Lu177-DOTA-TATE in July, October and December 2018. Due to persistent over-expression of somatostatin receptors in MTC liver metastases long-acting lanreotide was started in April 2019. The patient has received six doses of lanreotide (120 mg s.c. every 4 weeks) so far. Within half a year of therapy a decrease in calcitonin levels was observed.
Conclusions: The aim of this case report was to present other possibilities of MTC treatment when total thyroidectomy is non-curative, as well as side effects they may cause. In selected cases pharmacotherapy following surgery – in this case, lanreotide – may result in stabilisation of metastatic MTC.
Key words: endocrine system, medullary thyroid cancer, thyroid cancer treatment, vandetanib, lanreotide, PRRT.

A patient with metastatic gastric cancer treated with pembrolizumab – disease progression or adverse effect of the drug?

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Introduction: Hypopituitarism is a rare disease caused by decreased secretion of one or more hormones produced by pituitary gland. The most common causes of hypopituitarism are tumors, infections, injuries, irradiation and congenital hypoplasia of the pituitary gland. In the presented case hypopituitarism was not a result of any of these potential reasons.
Case report: A 70-year-old man was admitted to the hospital with anorexia, nausea, 5 kilograms weight loss and low blood pressure, despite the withdrawal of hypertension drugs. In March 2019, this patient was diagnosed with HER2 positive metastatic gastric cancer. He received CAPOX chemotherapy, trastuzumab and pembrolizumab or placebo within a clinical trial. The patient was pale and had dry skin. His heart rate was 100 bpm and the blood pressure 94/66 mmHg with orthostatic hypotension. Laboratory studies revealed a low level of cortisol (1.22 μg/dl), fT4

(0.72 ng/dl) and TSH (1.63 μIU/ml). The results suggested central hypothyroidism. The patient had also a low concentration of sodium (130 mmol/l) and potassium (3.36 mmol/l). The additional studies showed a low concentration of ACTH, which indicated secondary adrenal insufficiency. The abdominal ultrasound did not show any pathologies of the adrenal glands. The MRI of the pituitary gland was performed and did not reveal any abnormalities, such as tumor or stroke. The patient's condition improved quickly after an introduction of hydrocortisone and levothyroxine.
Conclusions: Immunotherapy's role in cancer treatment is still rising. Pembrolizumab is a therapeutic antibody, which blocks PD-1 protein localized on lymphocytes, resulting in activation of immune system and destroying cancer cells. Unfortunately, antibodies like pembrolizumab, despite their effectiveness in cancer therapy, may cause overreaction leading to autoimmune diseases. There have been reported cases of immune-related side effects manifesting as inflammation of the pituitary gland, hypothyroidism and pancreatitis. In the presented case the patient had non-specific symptoms, which might have resembled the signs of cachexia. It is vital to remember about adverse effects of immunotherapy.
Key words: immunotherapy, pembrolizumab, hypopituitarism, gastric cancer.

Incidentally diagnosed malignant pheochromocytoma in a patient with neurofibromatosis type 1

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Introduction: Neurofibromatosis type 1 (NF1) is a frequent neurocutaneous syndrome that predisposes for various benign and malignant tumors, mainly those of a neuroectodermal origin. Pheochromocytoma is the neuroendocrine, mostly benign, tumour with an incidence of approximately 2-6 new cases per 1 million.
Case report: We present the case of a 36-year-old woman with NF1 and the disseminated malignant pheochromocytoma with bones, liver and lungs metastases. The patient was asymptomatic when the tumour was firstly revealed during scheduled abdominal ultrasonography due to hydronephrosis diagnosed in childhood. The large, heterogeneous mass with areas of necrosis and hypervascularisation in the left suprarenal area was detected by abdominal CT. Elevated fractionated urinary metanephrines and high level of chromogranin A in plasma were found. The patient underwent unilateral adrenalectomy with nefrectomy due to kidney infiltration discovered during surgery. The histopathology confirmed the diagnosis of pheochromocytoma. 131I-metaiodobenzylguanidine (MIBG) and somatostatin receptor scintigraphy were obtained 6 weeks postoperatively. Both scintigraphies showed multiple metastases to the skeletal system, liver and lungs. Concomitantly, the patient's general condition was deteriotating rapidly. The weight loss and fatigue were observed. The patient suffered from muscles weakness, impaired motor function and excruciating pain. High doses of opioids had to be administered. In order to alleviate the symptoms, the 131I-MIBG therapy, as a form of the palliative treatment for disseminated disease, was carried out.
Conclusions: This case shows that malignant pheochromocytoma may not exhibit classical manifestations of the disease. Patients with NF1 features are at an increased risk of such tumours, therefore a routine pheochromocytoma screening should be introduced in all such patients.
Key words: malignant phechromocytoma, neurofibromatosis type 1, von Recklinghausen disease.

Unusual coincidence of purulent pericarditis and acute STEMI – case report

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Introduction: Purulent pericarditis is a rare type of the pericardial inflammation, accounting for < 1% of cases. It is caused by a bacterial infection, which may be hematogenous or extension from a contiguous source. This case report presents a patient with ST-segment elevation myocardial infarction (STEMI) who developed purulent pericarditis as a complication of staphylococcal sepsis.
Case report: An 84-year-old man with arterial hypertension, type 2 diabetes and chronic kidney disease was admitted urgently to tertiary cardiological department with acute anterior wall STEMI. Despite of successful angioplasty of the left anterior descending artery with a drug-eluting stent implantation, few hours post the procedure patient developed cardiogenic shock. Simultaneously, empirical antibiotic therapy was started due to increased inflammatory markers and chest radiography suggesting pneumonia. In transthoracic echocardiogram (TTE) besides of severely reduced ejection fraction (EF) of 18%, pericardial effusion without features of cardiac tamponade was detected. Thus, initially early post-infarction pericarditis was suspected. However, the next day TTE revealed increased amount of pericardial fluid with diastolic right ventricle collapse and essential respiratory variation in mitral flow velocity – indicating increased pressure in pericardial cavity. Chest radiography showed intensification of pneumonia and increased cardiothoracic ratio of 0.66. Urgent pericardiocentesis was performed, and 300ml of thick purulent fluid was drained. Cultures of the pericardial fluid and blood divulged the presence of methicillin-sensitive Staphylococcus aureus (MSSA). These findings confirmed a diagnosis of purulent pericarditis caused by staphylococcal sepsis. Patient was treated with antibiotics and percutaneous pericardial drainage. Despite of aggressive medical therapy of shock (mixed etiology – septic and cardiogenic) and simultaneous intravenous and intrapericardial antibiotic therapy, patient passed away.
Conclusions: The diagnosis of purulent pericarditis should be suspected in patients with septic symptoms and pericardial effusion. Our patient had 2 significant risk factors of purulent pericarditis: bacteremia and following invasive

cardiac procedure. Cardiac tamponade is a clinical diagnosis, although in this case TTE played a key role because of overlapping symptoms of post-infarction cardiogenic shock.
Key words: purulent pericarditis, cardiogenic shock, staphylococcal sepsis.

Case of calcifying lupus panniculitis that simulates intraductal carcinoma

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Introduction: Lupus panniculitis is a rare manifestation of lupus erythematosus. It may occur as separate disease or coexist with systemic lupus erythematosus. Lupus panniculitis characterizes by hard nodules mostly localized on the face, arms, breast and gluteal region. Healing of lesions associates with scarring, calcification and rarely ulceration.
Case report: In January 2019, a 57 years old woman was admitted to the Riga East University Hospital to establish a diagnosis of suspected Kaposi's sarcoma. The main complaint of the patient was skin changes (palpable skin nodules on extremities, breasts, abdomen) that progress for several months, weight loss (~ 10 kg in the last 6 months) and 2 years history of alopecia. Patient also noted that 14 years ago had Raynaud syndrome. Patient was referred to surgeon – biopsy from front abdomen wall nodule was taken – necrobiosis lipoidica. Patient underwent gynecological, abdominal USG and mammography. Mammography results showed suspected bilateral intraductal carcinoma (wide microcalcification zones with massive tissue retractions). Second biopsy from right hypochondrium revealed calcifying lupus panniculitis and acute vasculitis that refutes diagnosis of bilateral intraductal carcinoma. Patient was presented to the rheumatologist for the further examination. Complete blood count showed leukopenia. Serology revealed ANA IgG, anti-centromere B antibodies – positive, ENA IgG, anti-Sm antibodies – negative, anti-dsDNA antibodies elevated. The patient started therapy: Methylprednisolone 16 mg daily p/o and Methotrexate 15 mg once a week p/o and hyperbaric oxygen chamber therapy each session approximately 1 hour. Later Methotrexate has been replaced by Mycophenolate mofetil 500 mg daily p/o.
Conclusions: Therapy gives beneficial results: lesions become smaller and no new ones appear, hair loss stopped, and patient began to gain weight.
Key words: lupus panniculitis, lupus erythematosus, breast cancer.

Following the thread... anterior ischemic optic neuropathy as the first manifestation of bicuspid aortic valve – case report

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Introduction: Bicuspid aortic valve (BAV) is the most common congenital cardiac abnormality in adults with the prevalence of 1-2%. BAVs are associated with complications such as aortic stenosis, infective endocarditis, aortic insufficiency or in rare cases peripheral embolization.
Case report: A 41-year old patient, treatment naïve, without any significant previous medical history presented to district emergency department with sudden, left eye visual disturbances and headache with high blood pressure (160/110 mmHg). In physical examination systolic murmur over aortic valve was heard. In the course of diagnostics in fundoscopy unilateral optic disc swelling was found. CT and MRI of the brain did not reveal pathologies and angio-MRI excluded vascular malformations. Patient was discharged home with diagnosis of arterial hypertension and referred to further cardiological evaluation. Patient did not report for planned diagnostics, and year later he developed central retinal artery occlusion (CRAO). Further, detailed investigation, including transthoracic and transoesophageal echocardiogram as well as chest CT scan – revealed calcified bicuspid aortic valve, with moderate stenosis (AVA 1.4 cm^2) and mild regurgitation and moderate ascending aorta dilatation (46 mm). Moreover, patient was diagnosed with hyperuricemia, hyperlipidemia and hyperglycemia in addition to previous hypertension diagnosis. In 24-hr holter monitoring no rhythm disturbances were found. Pharmacological treatment of all risk factors and antithrombotic medication was implemented.
Conclusions: A thromboembolic complication, presenting as a central retinal artery occlusion preceded by nonarteric anterior ischemic optic neuropathy was the first manifestation of BAV. There is a strong need to pay attention to thoughtful cardiac evaluation in patients with signs and symptoms of optic neuropathy and retinal ischemia.
Key words: bicuspid aortic valve, central retinal occlusion, nonarteric anterior ischemic optic neuropathy.

Long-term survival of the patient with papillary thyroid carcinoma

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Introduction: Papillary thyroid carcinoma (PTC) is the most common histotype of thyroid cancer. It is associated with radiation exposure and it is more often among women. PTC is characterised by good prognosis 10-year survival rates for all patients with papillary thyroid cancer are estimated

at over 90%. The presence of lymph node metastases is frequent and distant metastases may occur in lungs, liver and bones.
Case report: We present a case report of a 75-year-old woman with papillary thyroid carcinoma (pT1N1M0) with the history of total thyroidectomy, left-sided lateral lymphadenectomy, triple radioactive iodine treatment (complicated by Horner syndrome after the first dose) and repeated removal of recurrence in the right supraclavicular area. In 2015 positron emission tomography/computed tomography (PET/CT) scan revealed a tumor in the left lung and an increased uptake of 18F-fluorodeoxyglucose (^{18}F-FDG) in the neck and axillary lymph nodes. The patient was qualified to surgical excision of lymph nodes in the right axillary fossa, radical dissection of neck lymph nodes and removal of the lower lobe of the left lung. Histopathology confirmed recurrence of papillary thyroid cancer. Posttherapeutic whole body scan obtained after complementary treatment with radioiodine proved the loss of 131-I avidity of the tumor. The subsequent therapy with sorafenib was discontinued after 6 months because of nagging side effects. In addition the patient underwent radiotherapy. Follow-up imaging and rising levels of thyroglobulin indicated another recurrence of papillary thyroid carcinoma in regional neck lymph nodes.
Conclusions: Presented case report shows a complexity of management of the patient with numerous relapses of papillary thyroid carcinoma. Even though cure rate in PTC is high, patients are liable to recurrences and have to be under regular medical supervision.
Key words: papillary thyroid carcinoma, recurrence, thyroidectomy, survival, I-131.

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

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Introduction: A hard, palpable mass located in the neck along with pain and dysphagia is supposed to have a cancerous process. It causes patient's conern and requires urgent diagnosis. It is important to differentiate carcinoma with disease proceeding with the same clinical manifestation – Riedel's thyroiditis.
Case report: A 67-year-old woman with nodular goiter regrowth was referred to the clinic because of suspected thyroid carcinoma. She underwent a strumectomy 11 years ago. The patient report neck pain and dysphagia lasting 6 months. Due to the pain and elevated inflammatory markers, the patient has been treated with anibiotics without improvement. Physical examination revealed a hard, enlarged thyroid. Laboratory tests showed elevated CRP level. TSH, fT3, fT4 levels were within normal limits. Increased aTPO, aTG and IgG4 level were observed. Thyroid fine needle aspiration revealed presence of neutrophils and histiocytes, without neoplastic cells. No bacterial growth was found on the thyroid FNA material and blood culture. The ultrasound showed thyroid with heterogeneous, reduced echogenicity, reduced vascularization and irregular boundaries. The infiltrate covered large vessels of the neck. The trachea was compressed by a goiter. CT revealed a goiter reaching the upper mediastinum and infiltrating left common carotid artery. The esophagus was attached to the infiltrate from behind. Numerous cervical lymph nodes were present in the thyroid area. No fibrosis in the abdominal cavity was observed. Based on the clinical picture and results, a Riedel's thyroiditis was diagnosed. The patient didn't agree to surgery. Glucocorticosteroids were included in the treatment.
Conclusions: Riedel's thyroiditis is a rare entity, with characteristics that suggest association with systemic fibrosis and other disorders triggered by IgG4. Diagnosis can be challenging due to the unspecific symptoms that overlap with other disorders, like anaplastic thyroid carcinoma. As to the treatment, there are no general consensus. In case of treacheal compression, surgery is indicated. Despite the lack of causal treatment, steroids are still the mainstay of therapy, but other medications aganist fibrosclerosis can be considered.
Key words: Riedel's thyroiditis, systemic fibrosis, thyroid carcinoma.

Livedoid vasculopathy – diagnostic and therapeutic challange – case report

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Introduction: Livedoid vasculopathy is a rare, chronic, thrombo-occlusive disease of small vessels. Women at the age of 15-50 are mostly affected. Symptoms tend to worsen in spring and summer with episodes of intravascular coagulation. Skin lesions are mainly located on lower extremities forming livedo racemosa and painful ulcers, which evolve into scars named atrophie blanche. Etiopathology of the disease is complex and remains unclear.
Case report: A 30-year-old woman with a 12-year-history of livedo racemosa on lower extremities is a patient of Department of Dermatology. Exacerbations of the disease were typically reported in summer as painful, cyanotic macules and papules progressing to tender, irregular atrophic scars. Livedoid vasculopathy and other conditions of similar clinical appearance were considered in the differential diagnosis. The latter were excluded based on histopathology (lack of vasculitis), direct immunofluorescence (lack of immunoglobulin and complement deposits), absence of antineutrophil cytoplasmic and antinuclear antibodies, antiphospholipid antibodies and cryoglobulins. Genetic testing for coagulation disorders was performed and prothrombin G20210A mutation was identified. The patient was treated with antiplatelet agents, anticoagulants and systemic glucocorticoids. The treatment was modified due to inefficacy, lack of long-lasting response or side effects. Mycophenolate mofetil was started recently, giving local improvement and ulceration healing.
Conclusions: Low prevalence of livedoid vasculopathy and its clinical appearance similar to other disease entities cause diagnostic and therapeutic difficulties. Unclear pathogenesis of livedoid vasculopathy and coagulation

disorders at different levels of coagulation cascade often result in unsatisfactory therapeutic effects and make clinicians search for other causes underlying livedo racemosa and atrophie blanche.
Key words: livedoid vasculopathy, livedo racemosa, prothrombine gene G20210A mutation, atrophie blanche.

Hepatocellular carcinoma metastases in adrenal glands in a patient with papillary thyroid cancer

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Introduction: Hepatocellular carcinoma (HCC) is a solid tumor of the liver and one of the most common primary tumors of the liver. It is strongly associated with cirrhosis, from both alcohol and viral infections with hepatitis B virus (HBV) or hepatitis C virus (HCV). Extrahepatic metastases (EHM) of HCC may occur in abdominal lymph nodes, adrenal glands, lungs or peritoneum.
Case report: A 64-year-old man, with the history of hepatitis type B and C and diabetes type 1 on insulin therapy, had a HCC in segment 2 and 3 of the liver. He underwent partial hepatectomy with cholecystectomy due to cholecystolithiasis. Histological examination revealed low grade (G1) HCC and liver cirrhosis stage F3/F4. Abdominal CT showed bilateral adrenal tumors (with radiological features of non-adenomas), which were enlarging during follow-up. Next, patient was diagnosed with a 4-cm papillary thyroid cancer (pT4N1Mx), treated by surgery and subsequent radioiodine (131I) thyroid remnant ablation, resulting in incomplete biochemical response. Bilateral adrenalectomy confirmed HCC metastases to the adrenal glands. Meanwhile, chest CT revealed lung lesions, also suspected for metastases. A follow-up abdominal CT revealed an infiltrating progressive lesion in location of the left adrenal bed. An exploratory laparotomy was done, confirmed an inoperable tumor of retroperitoneal space. Due to diagnosis of thyroid carcinoma patient was disqualified from therapy with multi-targeted tyrosine kinase inhibitors. Because of the multifocal progression the patient was qualified for radiotherapy and subsequent chemotherapy, which did not resulted in stabilization of the disease. The patient died of the progressive disease three years after the initial diagnosis of HCC.
Conclusions: Presented case report shows complexity of the medical care of the patient with disseminated hepatocellular cancer, particularly with a co-existing second maligancy.
Key words: hepatocellular carcinoma, extrahepatic metastases, adrenal tumors, papillary thyroid cancer.

Multiple myeloma: an elusive disease – case report

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Introduction: Multiple myeloma (MM) is a malignant plasma cell disorder from the group of monoclonal gammopathies. It is believed to be preceded by asymptomatic monoclonal gammopathy of unknown significance (MGUS), when the monoclonal protein is present in patients without underlying diseases. The diagnosis of MM requires 10% or more clonal plasma cells in bone marrow plus the presence of one or more CRAB features or one or more biomarkers of malignancy (clonal bone marrow plasma of 60% or higher, serum free light chain (FLC) ratio of 100 or above, or more than one focal lesion in MRI). MM is a chronic disease leading to end-organ damage.
Case report: In April of 2013, a 55-year-old woman with a history of stage 3 chronic kidney disease and subnephrotic proteinuria since 2005 (a renal biopsy from 2005 was normal), was admitted to the clinic for a diagnosis of proteinuria (2.2 g/24 h, no erythrocyturia, serum creatinine 1.27 mg/dl). Proteinogram was normal, autoimmune antibody panel was negative. A renal biopsy was performed, showing non-specific, mild glomerulal abnormalities. She was discharged in good clinical condition. In August of 2018, she returned with proteinuria of 2.7 g/24 h, progression of CKD (creatinine 2.8 mg/dl) and normocytic anemia, accompanied by metabolic acidosis (blood pH 7.277). A month prior she took part in a clinical trial of daprodustat. ESR was normal. The proteinogram was without abnormalities, however monoclonal protein (kappa light chain) was found in serum (366 mg/dl) and urine (17.5 g/24 h). A marrow biopsy showed 27.2% of plasma cells and 11% of monoclonal plasma cells. This lead to the diagnosis of MM, ISS stage III. Normal bone X-rays and calcium levels excluded osteolysis. She was referred to a hematology clinic, and advised to withdraw from the clinical trial.
Conclusions: Multiple myeloma is an illness found most commonly in older people. Non-specific onset often hinders the diagnostic process. Such symptoms may direct the differential diagnosis in a different way, delaying the introduction of treatment, which is vital to manage patients properly, and while slowing the course of the disease, it does not cure it. Thus, MM continues to be a challenge for clinicists.
Key words: multiple myeloma, monoclonal protein, free light chain.

The importance of treatment modalities and interdepartmental communication in an unusual case of recovery from chemotherapy-induced cardiotoxicity

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Introduction: When it comes to metastatic breast cancer, the main goal of treatment generally focuses on prolongation of the patient's life and improvement of quality of life, rather than complete remission. There are many challenges associated with the treatment of metastatic breast cancer, primarily related to the choice of chemotherapeutic agents. The first-line agents necessary for the treatment of aggressive cancers display an array of adverse effects and toxicities. This highlights the importance of collaboration between the oncologist and other specialists to manage the untoward effects of chemotherapeutic agents that may worsen quality of life and threaten treatment potential. For this reason, an oncologist must weigh the possibility of adverse outcomes against the potential clinical benefits when designing a treatment regimen.
Case report: This case discusses the care of a young woman with recurrent metastatic breast cancer, who suffered from severe cardiotoxicity as a result of treatment. Following the unexpected and drastic improvement of her cardiologic condition, subsequent treatment modalities had to be modified in order to reduce the risk of further cardiotoxic events.
Conclusions: This case explores the value of both drug selection in patients with complicated treatment history, as well as the importance of interdepartmental collaboration.
Key words: oncology, cardiology, breast cancer, cardiotoxicity, treatment modalities, interdepartmental collaboration.

Myocardial contusion in boxing ring: investigation and diagnosis

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Introduction: In the presence of blunt chest trauma (BCT) it is important to differentiate between serious cardiac injuries. Myocardial contusion can mimic myocardial infarction. In order to understand underlying mechanism, admission in hospital and observation with work-up are needed.
Case report: 40 years old Caucasian male committed to the hospital after a chest trauma in Boxing ring. After a punch into the chest, the patient felt shortness of breath, chest pain and weakness. There was no loss of consciousness. In the absence of improvement, ambulance has arrived and registered wide QRS complex tachycardia (heart rate (HR) 260 beats/min, blood pressure (BP) 40/20 mmHg). However, no medication was given. While carrying the patient in to the ambulance car all complaints (duration 20-30 min) have been gone. ECG was repeated: atrial fibrillation, HR 103 beats/min, BP 90/50 mmHg. Patient was transported to the hospital. After admission to the hospital coronary angiography was performed, epicardial arteries were normal. Chest X-ray came back normal without any infiltration. Echocardiography showed enlargement of both atria and preserved ejection fraction (EF): > 55%. Blood test: LDL: 2.06 mmol/l (2.6-3.5), AST: 82 U/l (≤ 40), CK creatinine kinase: 781 U/l (25-195), troponin-I: 20 445 ng/l (≤ 35), myoglobin: 273.8 μg/l (< 155), D-dimers: 205 μg/l (< 250). ECG: atrial fibrillation, HR 114 beats/min, ST depression in I, II, III, aVF, V3-V6. Because of atrial fibrillation transesophageal echocardiography (TEE) was made. TEE showed enlargement of right ventricle and right atria. No clots were found. After cardioversion, cardiac magnetic resonance tomography was made. In the left atria posterior-lateral midmyocardium late enhancement of contrast was seen, minimal local myocardial edema. EF left ventricle – 60%, EF right ventricle 50%.
Conclusions: Myocardial contusion can present with ST depression, ventricular tachycardia, atrial arrythmias which can be similar to myocardial infarction. These patients must be thoroughly investigated in order to determine right diagnosis, choose appropriate treatment and distinguish from significant cardiac injury.
Key words: myocardial contusion, blunt chest trauma, ventricular tachycardia.

Papillary muscle rupture after acute myocardial infarction: a case report

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Introduction: Mitral regurgitation after myocardial infarction can be caused by several mechanisms. One of them is papillary muscle dysfunction, which could cause hemodynamic instability, pulmonary edema and cardiogenic shock which requires urgent attention.
Case report: 80 years old Caucasian women admitted to the hospital due to ischemic chest pain. ECG showed atrial fibrillation, ST-segment elevation in II, III, aVF (inferior myocardial infarction). Troponin-I 604 ng/l. The patient underwent coronary angiography and embolization in smaller branches was suspected. Transthoracic echocardiogram after the procedure showed MVR II-IIIo, TVR Io, AoVR Io. After 2 days the patient developed progressive respiratory distress, hypotension, and tachycardia. Echocardiography was repeated and demonstrated pulmonary hypertension, MVR IVo, TVR IIIo, MV anterior leaflets A2-A3 are lower than MV annulus (1.6 cm in left atria chamber) and A3 edge is free. Due to echocardiogram findings ruptured chordae and severe prolapse were suspected. The surgical team decided to operate, but due to permanent atrial fibrillation, the patient was using Dabigatran 150 mg 2 times a day. Because of emergent situation antidote Idarucizumabum

5 mg/10 min i/v was administered. After that, the patient was transferred to cardiac surgery. The mitral valve was replaced with artificial valve St. Jude No.29 and tricuspid valve annuloplasty with De Vega suture was performed. During operation pulmonary edema has developed, and urgent medial sternotomy was made. Cardiopulmonary bypass was applied and after opening the right atrium, septum and left atrium atrial septal defect (~0.5 cm) was found. Revising the mitral valve, papillary muscle rupture was seen. TEE during the procedure showed a functional mitral valve and TVR I-IIo . The post-operative period was uneventful and the patient had survived.

Conclusions: Papillary muscle rupture is a rare and life-threatening complication after myocardial infarction. Additional attention should be provided for patients with inferior or posterior STEMI, non-STEMI, and women. After confirmation of diagnosis, surgery should be performed as soon as possible.

Key words: papillary muscle rupture, myocardial infarction, artificial valve, cardiogenic shock.

Unusual manifestation of IgG4-related disease in head and neck region

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Introduction: Laryngeal stenosis is an abnormal narrowing of airways and challenging condition for otorhinolaryngologists with high recurrence rate and varied etiology. When it appears in the supraglottic region, the autoimmune etiology should be considered, along with external beam irradiation, erosive lichen planus, pemphigoid or sarcoidosis. The symptoms include shortness of breath, dyspnoea at rest, dysphagia and voice alterations.

Case report: A 72-year old female patient presented with symptoms of temporary dyspnea at rest, secondary to severe supraglottic stenosis. The patient reported also cough and grunting. Endoscopic and CT examinations was performed showing a narrowing of the laryngeal entrance through the thickening of the aryepiglottic folds and the hypertrophy of the posterior commissure with a large soft-tissue overhang to the glottis with limited mobility of vocal folds. The diagnosis of bullous disease, pemphigus vulgaris or granulomatosis with polyangiitis was considered. Finally, after the histopathological examination a massive, subepithelial, mononuclear inflammatory infiltration was revealed, leading to the diagnosis of localized IgG4-related disease.

Conclusions: IgG4-related disease in head and neck region usually involves salivary glands, orbital pseudotumor or sinonasal lesions. Supraglottic stenosis in that disease is an extremely rare condition. Its management requires extensive diagnosis and underlines the importance of tissue biopsy. The clinical suspicion concerning IgG4-related disease should be increased concerning the laryngeal and supraglottic location.

Key words: supraglottic stenosis, IgG4-related disease, systemic disorders.

Severe allergic asthma and biologic treatment

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Introduction: Asthma is a common, chronic inflammatory disease of the airways, which is characterized by variable and recurring symptoms. The most common type of asthma is allergic asthma. According to GINA, the treatment of asthma should be personalized depending on the phenotype and possibly endotype. Omalizumab is first-line treatment in patients with severely allergic asthma, mediated IgE, regardless of eosinophil level. Is used for patients older than 6 years with moderate to severe persistent asthma, not controlled by asthma medicines

Case report: A 58-year-old female patient, teacher diagnosed 7 years ago with asthma. Positive allergy tests for dust and mites. Treatment with: Salmetrol 50/500 mcg 1 puff at 12 h, Montelukast 10 mg 1 cp/day Desloratidine 1 hp/day, Salbutamol 2 puffs as needed. At first visit 3.02.2018 she presented following symptoms: trembling cough, with difficult, permanent expectoration and aggravation during school dropout (chalk dust), dyspnoea, chest tightness feeling. After clinical examination score ACT = 12, spirometry was moderate mixed ventilator dysfunction with FeV1 decreased by 38%. Diagnosed with uncontrolled persistent severe asthma tr. IV. Treatment was modified: Foster (Beclametasone and Formoterol) 100/6 mcg 2 puffs at 12 h and when needed, Montelukast 10 mg 1 cp/day, Rupatadinum 1 cp × 3/day, Prednisone 2 cpz (10 mg). Evaluation after 6 weeks cough was slightly reduced in intensity, score: ACT = 14, spirometry: stationary, total IgE = 195 UI/ml, positive allergy tests: house dust mites (*Dermatophagoides pteronyssinus*), mixed pollens, weight 95 kg. Persistent severe allergic asthma severe V-stage uncontrolled treatment. New treatment was introduced to patient, dosages were calculate according to the dosing table, in this case 450 mg/month. Omalizumab therapy is initiated, f = 150 mg, 3 f/month, add-on to baseline therapy. Administer under medical supervision, subcutaneously, 1 ampoule in each arm and 1 ampoule in the thigh. Patient was monitored for 2 hours after administration, no local or general adverse effects. After one month of treatment, symptoms of a lot of remission, especially coughing, improved score-ACT = 18, FEV1 = 75%, good tolerance to Omalizumab (no local or general adverse effects). Changes in teatment: Prednisone was removed and Rupatadinum was reduce to 1 cp/day. Evaluation after 16 weeks (4 months), ACT score = 22, no exacerbations, spirometry: FeV1 = 90%, normal functional values.

Conclusions: It is considered a complete positive response. Treatment with Omalizumab 3 f/month will be continued. The duration of treatment with omalizumab has not yet been determined.

Key words: biologic treatment, severe allergic asthma, asthma.

A compromise between indicated therapy and life-threatening side effect – a case report of the patient with Stevens-Johnson syndrome

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Introduction: Stevens-Johnson syndrome (SJS) is severe condition of skin, mucosa of oral cavity and genitals. Risk factors include infections, but the most common causes are antibiotics, allopurinol, NSAIDs and antiepileptics. We present a case report of SJS caused by proton-pump inhibitor, in which it was necessary to find a compromise between indicated therapy and life-threatening side effect of its main component.
Case report: A 64-year-old woman with a history of Stevens-Johnson syndrome presented to the Allergology Department of the University Hospital in order to introduce treatment of HP and evaluate her reaction to a combination drug including bismuth subcitrate potassium, metronidazole and tetracycline. Previously, the patient has experienced four events of SJS symptoms. Most of them were preceded with the intake of pantoprazolum (PPI) but a few have been caused by an unknown agent. The first symptoms occurred 7 years ago. After the next expositions the symptoms were much more severe and lead to the patient's hospitalization. Within 24 hours, the woman's axillary and genital regions as well as her breasts were covered in painful rash and ulcers. The mucous membrane of the mouth, the lips and most of her face were also affected. Therefore, she was diagnosed with SJS. Additionally, two smaller dermal reactions probably to PPI occurred within the next two years. PPI were chosen as the most probable cause of the reaction. Last year the patient suffered from gastric ulcers (she also has a significant family history of stomach cancer) and the infection of *Helicobacter pylori* was confirmed during endoscopy. However, PPI medications had to be excluded from the eradication therapy. Treatment with the combination drug (bismuth subcitrate potassium, metronidazole and tetracycline) hasn't caused any adverse effects, but the initial elevated eosinophil level additionally increased to 7.9% and remains stable at the end of the therapy.
Conclusions: Stevens-Johnson syndrome is a serious and potentially lethal skin condition. It is the acute type IV hypersensitivity reaction associated with severe blistering, ulcerating and skin exfoliating due to infections or drugs. It is essential to identify the triggers and avoid them in order to decrease the number of life-threatening reactions. Moreover, introducing new drugs for other diseases requires close monitoring to note the first signs of adverse effects. It may be challenging to find a safe and effective therapy because there are no clinical diagnostic methods and provocation tests due to the severity of the reaction are contraindicated.
Key words: Stevens-Johnson syndrome, toxic epidermal necrolysis, proton-pump inhibitors.

Is any link between silicone breast implants and autoimmune thyroiditis? A case report

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Introduction: The autoimmune/inflammatory syndrome induced by adjuvants (ASIA), a pathology described by Shoenfeld and Agmon-Levin in 2011, incorporates diverse autoimmune disturbances induced by the exposure to diverse adjuvants. Adjuvants, including silicone or various agents found in vaccines, are capable to induce immune reactions.
Case report: A 41-year old healthy woman has received silicone breast implants for cosmetic reasons. Six months later she developed soreness of the breasts. Moreover, patient started to complain of chronic fatigue, sleep disturbances, short memory, generalized muscle weakness, and dry mouth. Due to the presence of general symptoms that suggested hypothyroidism, thyroid function was evaluated (one year before TSH level was 1.45 mIU/l, and anti-thyroid antibodies were negative). The lab results confirmed the clinical diagnosis of hypothyroidism (TSH 11.4 mIU/l, fT4 0.74 ng/dl) in the course of autoimmune thyroiditis (both anti-thyroid peroxidase (TPO) and anti-thyroglobulin (Tg) antibodies were highly elevated). The levothyroxine therapy was commenced. After 3 months euthyroidism was reached (TSH and fT4 were within the reference values) but without any relief in general symptoms of chronic fatigue, sleep disturbances and generalized muscle weakness. Moreover, there was a local progression in breast soreness despite of the treatment with high doses of the non-steroidal anti-inflammatory drugs (NSAIDs). The patients underwent removal of her silicone breast implant. After explantation, the local and general symptoms dynamically improved. Due to the typical course of disease (the presence of typical major symptoms, improvement after removal of an inciting agent and evolvement of autoimmune thyroid disease) the patient was finally diagnosed with ASIA.
Conclusions: The current evidence that silicone breast implants are safe is still limited. After the exposure to silicone autoimmunity may develop in patients with ASIA.
Key words: silicone implants, autoimmune thyroditis, autoimmune/inflammatory syndrome induced by adjuvants (ASIA).

Successfully treated isolated central nervous system relapse in patient with primary mediastinal large B-cell lymphoma in complete remission achieved with Rituximab-based chemotherapy – a case report

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Introduction: Central nervous system (CNS) relapse in patients with primary mediastinal large B-cell lymphoma (PMBCL) occurs in 2% of patients receiving Rituximab-based

chemotherapy and is usually characterized with a dismal prognosis. We report a case of successfully treated isolated CNS recurrence of PMBCL after a complete remission remission achieved with Rituximab-based chemotherapy.
Case report: *Underlying disease:* A 17 years old woman was admitted to the Hematology Department with 2 months history of progressively increasing cough, chest pain and fever. The CT scan showed pathological mass in mediastinum infiltrating the left lung. Mediastinal biopsy of lymph nodes revealed large B cell lymphoma. The patient was classified on the Ann Arbor staging as IVB, IPI score 3/4. Pretreatment with corticosteroids followed by 8 cycles of R-CHOP-14 chemotherapy assisted by G-CSF treatment were administrated. Mediastinal radiation therapy was performed, finished six months from diagnosis with complete remission. *CNS relapse:* Two months later the patient presented with morning headaches and strong, painful right torticollis. A cranial CT scan showed a right frontal hyperdense mass. After the stereotactic biopsy PMBCL relapse was diagnosed. The patient commenced R-MA/IVAC protocol with CNS-penetrating doses and stem cells CD34+ mobilization. Good treatment response was consolidated by high-dose therapy with thiotepa and auto-HSCT. Post-treatment CT scan showed almost total reduction of the pathological mass. CR was confirmed. *Last follow-up:* At the last follow-up visit (7 years after diagnosis) the patient was in good general condition, without symptoms, works and learns actively. The previously described changes were not visible in the current CT scan. The relapse of the underlying process was not revealed.
Conclusions: CNS relapse of PMBCL are rare, but most often associated with dismal prognosis. However, the recovery and achievement of complete remission are possible. Further research should concentrate on identifying prognostic factors for CNS relapse and on the need for CNS-oriented baseline staging.
Key words: PMBCL, lymphoma, CNS relapse, R-CHOP-14 treatment.

Unusual case of follicular thyroid carcinoma in patient with hyperthyroidism

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Introduction: The coexistence of hyperthyroidism and thyroid cancer remains controversial, but is rather considered a rare event. The objective of this case report is to highlight this unusual combination of two medical conditions.
Case report: A 85-year-old man with history of half-year hyperthyroidism was admitted to The Clinical Department of Endocrinology at the University Hospital in Krakow due to suspicion of follicular thyroid cancer located in right lobe with metastases in lungs. Based on the characteristic appearance on chest X-ray, ultrasonography, HRCT and fine needle aspiration cytology the diagnosis was confirmed. Patient underwent total thyroidectomy and the pathological result was verified as thyroid follicular carcinoma, widely invasive cancer with foci of poorly differentiated thyroid carcinoma. After surgery thyroid hormones were still above the upper limit of the normal range. Patient was qualified for I-131 therapy, which he was given 2 times. Hybrid SPECT/CT imagination showed increased tracer uptake in multiple lung nodules, behind the sternum and in subcutaneous tissue in the 12. right rib region.
Conclusions: This case demonstrates the need for further investigation of the patients with hyperthyroidism due to possibility of co-occurring thyroid cancer.
Key words: follicular thyroid carcinoma, hyperthyroidism.

Chronic lymphocytic leukemia and squamous cell carcinoma. Coincidence or dependence?

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Introduction: Patients suffering from chronic lymphocytic leukemia (CLL) are at an increased risk for developing fast growing diffuse large B cell lymphoma (DLBCL) by Richter's transformation and for skin neoplasms, especially non-melatonin skin cancer. It is believed, the reason of higher risk of squamous cell carcinoma (SCC) in CLL is partly because of impaired immunosurveillance of these patients. Another scientific reports link SCC occurrence to the Fludarabine chemiotherapy used in CLL.
Case report: We report a case of 82 years old male patient with extensive ulcerative tumor localized on the left cheek. According to the patient's estimates, the non-healing lesion has been present for 3 years. At this point he was suffering from CLL for 6 years. Rapid development of neoplasm has been observed in parallel with the progression of CLL. The first biopsy of mentioned lesion was obtained and revealed basal cell carcinoma (BCC). Due to the size and aggressive histological picture, surgery was carried out. 8 by 7 cm tumor was resected to the margin of healthy tissues. Skin rotation flap has been used as surgical technique. Postsurgical histopathology examination changed diagnosis to SCC. Radiotherapy was necessary due to R1 stage of resection and because another surgical excision would result in anatomic and functional defects. 8 months after surgery, locally aggressive recurrent tumor had been observed. Patient underwent palliative radiotherapy.
Conclusions: The dermatological literature relating to CLL is sparse.CLL is a malignancy that primarily eflects the elderly population and markedly increases their risk of developing skin cancers, especially SCC. Moreover the disease course of SCC tends to be more aggressive. Rapid development of cheek tumor in case of CLL, can suggest the decreased function of immune system either in the course of disease or during cytostatic treatment.
Key words: chronic leucocytic leukemia, squamous cell carcinoma.

Therapy optimization for patients with ulcerative colitis who develop immunity to treatment

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Tutor: –

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Introduction: Ulcerative colitis (UC) is an inflammatory bowel disease causing irritation, inflammation, and ulcers in the lining of the large intestine. The primary symptoms of active disease are abdominal pain and diarrhea mixed with blood, occuring intermittently with periods of no symptoms between flares.
Aim of the study: We present the case of a 39 year old pacient that arrived at Gastroentherology Clinic of "Sf. Spiridon" Hospital, Iasi, who has a clinical history of UC. First intention therapy was corticotherapy, followed by the aminosalicylates maintaining period, but after 2 years of therpay the pacient became non-responsive and UC became active again.
Material and methods: We opted for biological therapy with Infliximab. The particularity of this case resides in the fact that the pacient is developing anti-Infliximab antibodies, becoming non-responsive to this treatment too. This lead to therapy shift on Adalimumab. Recent colonoscopy revealed active inflammatory lesions on the transverse colon, certifying the non-responsive Infliximab therapy.
Results: Also, remission was observed on the ascendent colon and rectum. The therapy optimization consisted in reduction of Adalimumab administration intermission from 2 weeks to1 week.
Conclusions: Ulcerative colitis is a challenging disease, both in diagnosis and treatment. Despite all technological progress, colonscopy is still the gold standard in diagnosing and treating UC. The new challenge in biological therapy is Vedloizumab, recent approved protocol by the national health policies. Future treatment possibilities include switching colonscopy with non-invasive and more accurate methods, to increase patient compliance and reduce the time and costs of the investigations.
Key words: ulcerative colitis, biological therapy, antibodies, colonscopy.

Retroperitoneal fibrosis

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Introduction: Retroperitoneal fibrosis is a rare disease characterised by inflammation and fibrotic changes in the retroperitoneal space. Retroperitoneal fibrosis results in the compression and pathology of the ureters and surrounding blood vessels, which has implications on the kidneys and other major organs. The aetiology of the disease is either idiopathic or secondary, which is related to malignancies, infections or iatrogenic causes. The disease is prevalent in men between 40-60 years at a ratio of 1 : 200,000. The rarity of the disease eludes to a significant amount of cases being undiagnosed, and thus there needs to be significant importance given to ensuring a diagnostic algorithm.
Case report: In March 2018, a 72-year-old man was admitted to the hospital because of abdominal pain, fever and weight loss. Medical history includes hypertension, paroxysmal atrial fibrillation, thoracic degenerative joint disease, lumbar spinal haemangioma and total thyroidectomy. Diagnostic tests showed elevated inflammatory markers; while imagining with USG showed dilation of the right ureter and CT revealed a concentric retroperitoneal periaortic mass. Additionally, a computed tomography angiography (CTA) showed a soft tissue structure of 16mm thickness on the anteromedial side of the abdominal aorta; resulting in hydronephrosis. Hydronephrosis was treated with a JJ catheter, while the patient was also prescribed methylprednisone (32-16 mg) and AZA. Histological biopsy of the retroperitoneal space showed a chronic inflammatory infiltrates and local fibrosis. Once a USG confirmed a normal right ureter, the catheter was removed, and CT confirmed a reduction in the size of the retroperitoneal mass.
Conclusions: Improvement of imaging and diagnostic techniques can ensure optimised patient outcomes. The clinical picture has shown that it is imperative to establish a diagnostic algorithm due to the vague symptoms but severe complications. It is therefore essential the clinician be aware of how to evaluate rare diseases such as this when encountering differentials diagnostically.
Key words: retroperitoneal fibrosis, hydronephrosis, retroperitoneal periaortic mass, methylprednisone.

Vasculitis – a rare disease with common symptoms

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Introduction: Granulomatosis with polyangiitis (GPA) is a multisystem autoimmune disease of unknown aetiology. It is characterized by the presence of a necrotising vasculitis and granulomatous infiltration often associated with anti-neutrophil cytoplasmic antibodies (ANCA) and mostly located in the respiratory tract and kidneys. The average annual incidence of GPA in Poland was estimated to be a rare disease – 4.9/million in the general population.
Case report: A 68-year-old man was admitted to hospital due to a 3-week history of mild fever, weight loss, nasal congestion, post-nasal drip, recurring episodes of cough and epistaxis, despite treatment with Amoxicillin/Clavulanic acid and Clarithromycin. The patient's past medical history was unremarkable, he denied smoking, travelling abroad or contacting with infected patients. Physical examination revealed redness of palatoglossal arches, signs of blood and white discharge on oral mucosa and uncharacteristic non-itchy rash on the back. Joint lesions were not found in both the physical examination and the interview. Moreover, vital signs were normal with body temperature at 37.6°C. Laboratory tests

showed increased levels of neutrophils (14.3 x 10^3/mcL), C-reactive protein (300 mg/l), ferritin (3772 ng/ml), fibrinogen (1023 md/dl) and D-dimer (3509 ng/ml). Renal function endured intact. In addition, the presence of malignancy, nor tuberculosis or other infections was excluded. Likewise, blood cultures remained negative. Head and chest X-ray and abdominal ultrasound showed no abnormal findings while head and chest computed tomography scan displayed thickening of the mucosa in the ethmoid sinus and right maxillary sinus, enlarged lymph nodes of the neck and nodular fibrous lesions in the upper lobes with thickening of the pleura on both sides. Furthermore, immunoassays revealed cANCA in fluoroimmunoassay (1 : 160) and over 150u in ELISA. Hence, GPA was highly suspected. After the administration of glucocorticosteroids and cyclophosphamide, a significant improvement was observed. Therefore, the patient was transferred to a reference centre for further treatment.
Conclusions: Properly performed diagnosis of GPA is necessary to implement an accurate therapy, whose course depends on the organs affected and requires long-term immunosuppression. It is noteworthy that 80% of patients with proper therapy achieve remission, whereas misdiagnosed or untreated GPA may cause life-threatening organ damage.
Key words: granulomatosis with polyangiitis, vasculitis.

Staphylococcus aureus – a hard one to defeat

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Introduction: *Staphylococcus aureus* bacteraemia (SAB) is a serious infection with high annual incidence and mortality rate which, according to studies, reaches up to 30%. Approximately one-third of patients with SAB develop septic metastases, which result in such conditions as endocarditis or osteomyelitis. In adults, hematogenous *S. aureus* osteomyelitis of the vertebral column occurs most often but due to its unspecific symptoms it may be misdiagnosed and mistreated.
Case report: A 50-year-old man with no comorbidities was referred to hospital due to debilitation and raised temperature. He was previously hospitalized for 7 days because of fever of unknown origin and sepsis confirmed in blood culture (methicillin-sensitive *S. aureus*), discharged on oral antibiotic therapy. Back then he presented similar symptoms as on current admission. The patient reported intermittent headache, high body temperature (max 38°C) for approximately 1.5 months, non sternocardial chest pain (7 NRS) radiating to thoracic segment of vertebral column and congenital hypoacusis in the right ear. He denied cough, sputum expectoration and injection drug use. On physical examination vital signs were normal, no abnormalities in chest, abdomen and general neurologic examination were found. Laboratory studies indicated increased level of C-reactive protein (63.2 mg/l). Accessory investigations showed no abnormalities in chest X-ray, abdomen, neck and lymph nodes ultrasound. Moreover, a thoracic vertebrae MRI revealed inflammatory lesions: increased amount of fluid in left costotransverse joint at the level Th6-Th7 with bone marrow oedema and infiltration of surrounding tissue. Therefore, neurosurgical and cardiological consultations were scheduled. There was no indication to surgical intervention. Transthoracic echocardiography (with clear image) ruled out infective endocarditis. Simultaneously, cefazolin and gentamicin intravenous therapy was administered. Blood cultures taken during 3 days remained negative as well as urine culture and viral tests. After the switch to cloxacillin (2 g every 4 h), the patient was transferred to the infectious diseases hospital for further long-term management. Unfortunately, during follow up he suffered a vertebral body fracture upon standing.
Conclusions: Vertebral osteomyelitis cause difficulties both in diagnosis and management. Due to localization and blood supply, it requires adequate long-term effective treatment that helps successfully combat the challenges presented by SAB.
Key words: *Staphylococcus aureus* bacteraemia, vertebral osteomyelitis.

Acute renal failure due to lung-kidney syndrome associated with granulomatosis with polyangitis: case report

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Introduction: Granulomatosis with polyangeitis (GP) is described as systemic vasculitis affecting small and medium calibre vessels. It may have insidious onset and later evolution to lungrim syndrome. This report aims to elucidate the case of a GP patient with acute renal failure (ARF).
Case report: A 63-year-old female patient presented with recurrent pneumonia and weight loss for 8 months in addition to oliguria in the last month. She was admitted for treatment of community-acquired pneumonia and during this period presented with acute renal failure. Pulmonary image examinations revealed the presence of nodules, consolidation lesion, pleural effusion, micronodules, cyst and atelectasis. She underwent antibiotic and pulse therapy with cyclophosphamide, which was discharged after stabilization of the clinical case.
Conclusions: The present case illustrates an unusual complication of high GP morbidity and mortality, which is diagnosed by the atypical pattern of ANCA positivity. Lung-kidney syndrome may present an unfavorable outcome if treatment is neglected.
Key words: acute renal failure, lung-kidney syndrome, granulomatosis with polyangitis.

Complications caused by HIV virus in case of 38 years old female patient – case study

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Introduction: HIV (human immunodeficiency virus) cause AIDS (acquired immune deficiency syndrome). Infection with HIV occurs through sexual contact, contaminated injection equipment, perinatal exposure, and consequent exposure to secretions or tissues containing the virus. There is an asymptomatic and symptomatic phase of virus infection. The symptomatic phase is a consequence of significant impairment of the functional immune system and further rapid disease progression.
Case report: A 38-year-old patient, walking, independent in self-care, in logical verbal contact. Patient hospitalized in a geriatrics clinic. The patient reported a persistent fever above 38.5°C, accompanied with episodes of unconsciousness. The patient has been taking oral steroids for cutaneous eczema. Patient at the time of admission did not report the occurrence of infectious diseases. A positive HIV result was obtained, confirmed by Western-Blot. A reduced level of T-Helpers has been detected. As a result of microbiological tests of blood and cerebrospinal fluid samples, *Cryptococcus neoformans* was detected. Pulmonary embolism was detected in contrast tomography of the chest. Antiretroviral therapy was used. Diagnosis for tuberculosis was carried out. *Mycobacterium tuberculosis* complex DNA detected. Antifungal therapy (Amphotericin B, Flucotizine, Biseptol. Azithromycin, steroid therapy) was used. Due to the increasing renal parameters and the ineffectiveness of cryptococcosis treatment, it was decided to stop treatment with Amphotericin B and use fluconazole. The patient was transfused with 5 units red blood concentrate due to anemia. Chest tomography was performed, finding rider embolism. Magnetic resonance imaging of the brain was performed with contrast. Inflammation was observed in the right hemisphere of the brain. Tire syndrome found. *Mycobacterium tuberculosis* complex DNA was detected in the cerebrospinal fluid-resistant to rifampicin. The patient's condition gradually deteriorated, there were disturbances of consciousness, psychomotor agitation. Due to the epidemiological situation, there were difficulties to transfer the patient to a specialized infectious disease center. Finally, the patient was transferred to Infectious Hospital.
Conclusions: HIV virus infection does not give characteristic symptoms. If you don't do a diagnostic test, you may not know that you have been infected even for 10-12 years. A person who does not know that he lives with HIV can get AIDS disease. It can also infect others. AIDS prevention is very important. Rapid application of antiretroviral therapy significantly extends patient survival. In the majority of untreated patients HIV infection progresses to AIDS within 10 years, and the patient dies within the next 2 years. Death occurs as a result of infection or failure of organs.
Key words: acquired immune deficiency syndrome, acquired immune deficiency syndrome, case report.

Essential mixed monoclonal cryoglobulinemia – a diagnostic challenge

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Introduction: Mixed monoclonal cryoglobulinemia (MMC) is characterised mostly with the presence of monoclonal IgM and polyclonal IgG, which spontaneously precipitate at low temperatures and then dissolve after the temperature is increased. It is usually associated with hepatitis C infection, B-cell malignancies or connective tissue diseases, however in rare cases (1 : 100000) it may also have an idiopathic origin (essential MMC).
Case report: A 60-year-old man presented to the hospital with a 7-month history of looking for diagnosis for severe arthralgia of upper and lower limbs, which finally resulted in walking disability. In addition, the patient reported general fatigue, xerostomia as well as cyanosis, paraesthesia, sensory loss and cold sensation of distal phalanges, which occurred few times a day and resolved after warming. On examination large necrotic lesions of distal phalanges of both hands, palmar erythema and peripheral oedema of both ankles were observed. Laboratory findings revealed highly elevated inflammatory markers (CRP = 160 mg/l, ESR = 52 mm/h, WBC = 24 x 10^3/µl), signs of heart failure (NT-pro-BNP = 1476 pg/ml), glomerular basement membrane damage (proteinuria = 25 mg/dl, microhaematuria = 10-13 per HPF), anaemia of chronic diseases (HGB = 12.7 g/dl, Fe = 45 µg/dl, ferritin = 720 ng/ml) and thrombosis (D-dimer = 21 µg/ml, fibrinogen = 430 mg/dl), however deep vein thrombosis and pulmonary embolism were excluded. Immunofixation and bone marrow biopsy confirmed the presence of cryoglobulins in the form of bi-clonal IgG and IgM, and excluded lymphoproliferative malignancies. Furthermore, negative results of RF, c-ANCA and p-ANCA ruled out the vast majority of rheumatic disorders, while borreliosis, hepatitis B, C and HIV infections were also excluded by immunodiagnostics. Thus, the final diagnosis of essential MMC was established and dexamethasone therapy (24 mg/d) was introduced with rapid improvement in patient's condition.
Conclusions: Essential MMC should be acknowledged by every clinician as a serious systemic disease of exclusion with wide range of clinical manifestations, resulting mainly from vasculitis.
Key words: arthralgia, cryoglobulins, mixed cryoglobulinemia, necrosis, vasculitis.

Diagnostic difficulties and novel treatment of patient with Rendu-Osler-Weber disease

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Introduction: We will present the case of 53-year-old patient with Rendu-Osler-Weber disease. The patient was admitted to the Hematology Department for bevacizumab treatment.

The disease occurs in many family members and its symptoms appear in the 6-7 decade of life.
Case report: The patient first symptoms appeared in 2013, then as a result of abdominal ultrasound examination multiple liver hemangiomas were found. Patient reported minor nosebleeds and heavy periods. Laboratory tests revealed iron-deficiency anemia. In 2014, the patient had the first episode of anemia requiring blood transfusion. In April 2016, a diagnosis of Rendu-Osler-Weber disease, also known as hereditary haemorrhagic telengiectasia (HHT) was established, based on mutiple liver hemangiomas, family history and recurrent epistaxis. From the beginning of 2019, the symptoms of the disease intensified. Recurrent gastrointestinal bleeding was observed with anemization (hemoglobin up to 6 g/dl), transfusion requirement was 2-3 unit/month. 15.10.2019 as a result of deterioration of the patient's condition, a severe clinical course of the syndrome with organ complications was found. Numerous gastric vascular changes, observed in repeated gastroscopy, were treated with argon plasma coagulation. 20.12.2019 the patient was given the first dose of bevacizumab 200 mg IV. The day after, after discharge from the hematology ward, on 21.12.2019 she went to the surgery ward due to massive gastrointestinal bleeding. Gastroscopy revealed two 5 mm diameter gastric ulcers coated with clots injected with adrenaline. 4 units red blood cells and 2 units FFP (fresh frozen plasma) were transfused. After 3 weeks On January 13, 2020, she was re-admitted to the hematology ward for the second dose of bevecizumab. On admission, the patient was in mediocre condition with epigastric pain and anemization (Hb – 6.5 g%). Performed gastroscopy revealed no evidence of bleeding. The patient was transfused with 2 red blood cell units and received a second dose of bevacizumab. It was the last transfusion. On March 6, 2020, after control tests, the fourth dose of the drug was given and it was decided to extend the intervals between subsequent doses to 5 weeks due to significant improvement in haemoglobin concentration.
Conclusions: Bevacizumab is a promising line of treatment for HHT patients with refractory anemia and may be useful as a bridge therapy awaiting for liver transplantation.
Key words: Rendu-Osler-Weber disease, HHT, bevecizumab.

A case of multiple diseases in HIV-positive patient returning from Bangkok

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Introduction: Thailand had the highest prevalence of HIV in Southeast Asia, so depending on the traveler's type of behavior there may be a higher chance of contracting HIV as well as other sexually transmitted infections (STI), tropical and infectious diseases. The progression of HIV infection to AIDS stage can be indicated by the occurrence of AIDS-defining clinical conditions including Burkitt's lymphoma.
Case report: A 53-year-old male was admitted in November 2019 to the Department of Infectious and Tropical Diseases and Hepatology due to the fever of unknown etiology and intense pain in the right groin. He had history of frequent travels to Bangkok, Thailand, and recently returned to Poland 2 months ago. Patient had an ultrasound examination (USG) of right inguinal region, where a tumorous change was described – a possible pathological lymph nodes package or coagulated venous aneurysm. Due to being admitted to an infectious diseases department, patient was screened for various infections. Two days into the hospitalization, first confirmed results came in – patient was revealed to be HIV-positive and he has been diagnosed with syphilis. Moreover, patient had a chest X ray in which image resembled miliary tuberculosis. Due to all these findings patient had been isolated and put on cART therapy, doxycycline and tuberculosis treatment. Moreover, a consultation with surgeon was ordered. A bronchoscopy was carried out and microbiological samples taken during procedure excluded presence of any *Mycobacterium* species. Consulting surgeon, basing on additional CT and MRI scans, confirmed the presence of pathological lymph nodes in right inguinal region. Due to that, patient was transferred to Surgical Department. The lymph nodes were surgically removed and their histopathological analysis revealed Burkitt's lymphoma thus marking that the patient is in AIDS stage of HIV infection.
Conclusions: This case demonstrates a constellation of suspected and confirmed conditions of different etiologies in one patient, which were probably acquired during stay in Bangkok. It also shows an importance of thorough screening of patients returning from tropical countries. Travelers should take caution against STIs in those regions.
Key words: infectious diseases, HIV, AIDS, sexually transmitted infections.

Serious, recurrent blood morphology disorders after methotrexate overdose in 77-year-old patient with rheumatoid arthritis

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Introduction: Methotrexate is a competitive inhibitor of dihydrofolate reductase and as such, it interferes with DNA synthesis. Low-dose methotrexate (7.5-25 mg weekly) is a drug of choice in management of rheumatoid arthritis. It can be associated with a range of adverse effects which risk and intensity are dose-dependent.
Case report: A 77-year-old man with a history of smoking and many internal diseases was referred to the hospital due to neutropenia and macrocytic anaemia: haemoglobin 7.5 [g/dl], neutrophils 2.89 [10^3/µl], platelets 68 [10^3/µl] on admission. Anamnesis revealed weight loss (5 kg/previous month) and overdosing of methotrexate during rheumatoid arthritis therapy (10 mg/day). Also, the patient was treated for atrial fibrillation with rivaroxaban. Mycosis and leukoplakia of the oral cavity were visible on examination as well as inflammatory lesions in the anal area. The patient presented clinical features of pneumonia too. Daily monitoring of blood morphology during hospitalization demonstrated serious

fluctuations in haemoglobin, neutrophils and platelets levels. Results were constantly indicative of macrocytic anaemia with no vitamin B_{12} deficiency. Additional investigations included chest X-ray and abdomen ultrasound – no neoplastic lesion was found. Blood culture was not contributory, hence empiric treatment with levofloxacin was implemented. Essential intervention was to discontinue methotrexate and rivaroxaban and introduce increased folate supplementation. The patient underwent widespread antifungal, antibacterial and antiviral intravenous treatment. Packed red blood cells were transfused 4 times and platelets concentrate twice, in total. Normal neutrophils level was reached after a nine-day administration of filgastrim too. Complex and consistent treatment soon led to normalization of blood morphology parameters and patient's general health improvement.

Conclusions: Inappropriate dosage of methotrexate may lead to serious side effects which, if not managed properly, might result in life-threatening conditions. It is crucial to ensure proper medication compliance, which concerns elderly patients in particular.

Key words: Methotrexate, myelosupression, thrombocytopenia, macrocytic anaemia.

Surgical Case Report

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List of papers:

Middle meningeal artery embolization as a treatment for chronic subdural hematoma

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Introduction: Chronic subdural hematoma (CSDH) is a very common neurosurgical problem especially among elderly patients due to their tendency for head trauma and widely prescribed anticoagulant and antiplatelet therapy. Endovascular intervention is the sole treatment aimed at the pathogenesis of CSDH. This case report describes the first experience of using this method in Russia.
Case report: A 78-year-old male patient was admitted to the Department of Neurosurgery. He complained of weakness of the right arm and right-sided body numbness and also mentioned having a head injury a month before. The patient constantly gets dual antiplatelet therapy after coronary artery stenting. On admission, a CT scan was performed and a midline shift rightwards and inhomogeneous content in the left subdural space were revealed. An emergence burr-hole procedure was performed, nearly 100 cm^3 of fluid was evacuated. Follow-up CT showed a left-sided subdural hematoma again in the same volume, which was managed by another craniostomy. Within the month patient had been repeatedly presented to the hospital complaining of excruciating headaches. CT-scan revealed recurrence of the subdural hematoma. Due to the lack of prospects of neurosurgical management the medical council was decided to embolize a middle meningeal artery (MMA). According to the last scientific data CSDH enclosed into a capsule which is the source of micro-hemorrhages and fluid exudation. MMA supplies a capsule with the blood and an embolization interrupts the communication. Polyacrylamide microspheres in size 300-500 microns were introduced through a microcatheter in the MMA through the access of the femoral artery. The postoperative course was favorable. Five months after discharge a control CT scan showed a complete recovery.
Conclusions: Thereby, we believe that MMA embolization is a minimally invasive, perspective and pathogenically based approach for CSDH.
Key words: chronic subdural hematoma, middle meningeal artery embolization, recurrence.

Acute ischemic stroke in posterior inferior cerebellar artery in a young woman: case report

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Introduction: Stroke in young patients is uncommon, comprising 15% of all stroke patients. Stroke in posterior inferior cerebellar artery is even more uncommon and accounts for about 1.5% of all stroke cases.
Case report: A 22-year-old woman was admitted to Pauls Stradins Clinical University Hospital Emergency Department with headache, nausea and neck pain. She had a previous medical history of migraine since 14-years old and was also taking oral contraceptive pills (Drospirenone). In addition neurological examination revealed no abnormalities (Glasgow Coma Scale [GCS] = 15) but the initial computed tomography scan (CT scan) showed ischemia in right cerebellar lobes. The patient was hospitalized in Stroke Unit and magnetic resonance imaging (MRI) was performed the next day. After 2 days the patient's condition was worsening (GCS = 11, ophthalmoparesis and dysarthria). CT scan was done and it showed obstructive hydrocephalus and acute ventriculostomy was performed. There were no complications during the procedure, and the next day patient's condition improved. Early rehabilitation after surgery was started and after a week ventriculostomy was evacuated. Considering clinical manifestations and laboratory findings the patient was discharged from the hospital with recommendations and early post stroke rehabilitation was started.
Conclusions: Young patients with posterior circulation stroke may not show early neurological abnormalities but observation is neccessary. One of the most dangerous complications in cerebellar stroke is obstructive hydrocephalus that can lead to brainstem compression however it could be prevented by early ventriculostomy.
Key words: CT scan, hydrocephalus, posterior circulation stroke.

Plastic and reconstructive surgical treatment of extensive acne inversa (hidradenitis suppurativa): case report

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Introduction: Acne inversa also described as purulent apocrine gland inflammation (hidradenitis suppurativa) is a chronic inflammation of the skin, which causes painful and purulent lesions that occur routinely in areas with a large number of apocrine glands, such as axillae, groin and breast folds. This is the case of a 46-year-old woman with treatment-resistant acne inversa – Hurley grade III.
Case report: A 46-year-old woman was admitted to the plastic surgery department with a long history (10 years) of disease – acne inversa. The patient is a nurse. She is overweight, BMI – 27.5. The disease was exacerbated in May 2019. She takes rifampicin and clindamycin. The patient was in a severe condition with multiple purulent fistulas in the axillae, breasts folds, groin and lower abdomen. She was qualified for the multistage resection of lesions with the subsequent flap surgery. In the first stage of the operation, which took place on Sept 19, 2019, purulent fistulas of the right axilla and below the right inframammary fold were excised. A free intermediate thickness skin graft was taken from both thighs and sewn into the right axillary region. During the follow-up,

her surgical wounds were healing and qualified for the second stage. The second stage (Nov 19, 2019) of the operation was excision of lesions in the lower abdomen in the scar after cesarean section. The next stage will be excision of purulent fistulas in the area of the left axilla and under the left inframammary fold area.
Conclusions: Such severe HS cases require many surgical procedures, which lead to longer recovery time. The patient did not report to the hospital for 10 years until the critical moment. Early detection and treatment are crucial because the situation gets worse every year, as was the case here.
Key words: plastic surgery, reconstructive surgery, surgical treatment, acne inversa, hydradenitis suppurativa, multistage resection, skin graft, flap surgery.

The surgical treatment of the giant retroperitoneal pleomorphic liposarcoma affecting the left renal artery and vein

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Introduction: Retroperitoneal sarcoma is a rare type of the soft tissue cancer that takes up to 15-20% of all the soft tissue sarcoma. Liposarcoma, differentiated, as well as dedifferentiated, and leiomyosarcoma are the most common histologic subtypes within the retroperitoneal space. The pleomorphic liposarcoma, however, is a rarity, but does occur. It takes up about 5% of all liposarcomas, and primarily affects elderly - 60 years of age and above. It is also important to note that pleomorphic liposarcoma is more likely to target men.
Case report: On December 23rd, 2019, a 55 year old woman was referred to the Latvian Oncology Center from the department of gynaecology in the Clinical Centre "Gaiļezers", because of the large mass in the abdominal cavity, which was identified as a liposarcoma through a core biopsy procedure. The abdominal CT has shown that the lipomatous mass in the retroperitoneal space had the dimensions of 23 × 31 × 48 cm maximum. The tumour has pressed the small and the large bowels, as well as pancreas, to the right side of the stomach, but did not affect the magistral blood vessels. Surgeons have made the decision to perform the surgical treatment. The patient raised a complaint about the abdominal distention, pain and appetite loss, and therefore, she was maintained through the parenteral feeding. Under the general anaesthesia the total middle laparotomy was performed, and a giant tumour, which took up a good deal of the abdominal space, has been identified. Mass mobilization has started from the pelvic region and the dissection continued between the bowel and the tumour. It was found that the left ureter and gonadal vessels were connected to the giant mass. Thereby they were ligated, and the tumour has affected the left renal artery and vein. Therefore, the nefrectomy and adrenalectomy were also performed on the patient. Lipomatous mass was surgically removed from the abdominal cavity and weighted 15 kg. There were two drainages inserted – one under splenic and one in the pelvis. Histology has confirmed the high-grade pleomorphic liposarcoma at the stage pT4(m)N0M0 R0. After the surgery the patient was referred to the intensive care unit. She was in a stable condition, had no complaints and was discharged from the hospital in 12 days.
Conclusions: Retroperitoneal pleomorphic liposarcoma is rare soft tissue cancer, predominant in the patient group of ages 60 and above, and more often found in men than women. The symptoms depend on the tumour size and the location, and are often absent at the early stages. The treatment for retroperitoneal sarcoma is highly individualised. For the greatly sized tumour and the cases of other organ penetration, the surgery is the only solution for the complete and effective treatment.
Key words: retroperitoneal pleomorphic liposarcoma, sarcoma, liposarcoma, surgery, retroperitoneal location.

Amyand hernia in 80-year-old women

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Introduction: Amyand's hernia is defined when the vermiform appendix is found within an inguinal hernia sac. The possibility of this type of inguinal hernia accounts for less than 1% and the probability of complication as inflammation, perforation or abscess formation is less than 0.1%. Trapped appendix the most commonly occurs within inguinal and femoral hernias, but it can also be found in incisional and umbilical hernias.
Case report: 80-year-old woman was admitted to the Emergency Department with suspicion of abscess in the right inguinal area. During the physical examination a hard inflammatory infiltrate with palpable thickness in the central part was found, without splashing symptoms. The USG showed litho-cystic change with tissue swelling. Laboratory tests revealed high C-reactive protein and hypokalaemia. The decision about conventional treatment was made. She was discharged with antibiotics. Two days later the patient was admitted to The Department of General, Minimally Invasive and Elderly Surgery in Olsztyn because of deterioration of symptoms. She was qualified for an emergency surgical procedure. Gangrenous appendicitis trapped in the direct inguinal hernia was found during the procedure. The conversion to laparoscopy was made – hernioplasty and appendectomy were performed. There was no complication and the patient was discharged on second postoperative day.
Conclusions: Amayand's hernia is an unusual type of inguinal hernia. This disease has indistinct clinical signs and symptoms and unclear radiological features, so diagnosis is generally made during the surgery procedure. The most helpful examination for preoperative diagnosis is CT. Surgical management is based on patient's age, life expectancy and type of Amayand hernia.
Key words: Amyand's hernia, inguinal hernia, trapped appendix, appendectomy.

Dunbar syndrome, one year follow up

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Introduction: Dunbar syndrome is a rare abdominal disorder with a reported incidence of 2 per 100,000 population. It is known as the condition common with young females between the ages of 30 to 50 years. Because of poor and non-specific presentation it is misdiagnosed. Manifestation is affected by the median arcuate ligament external compression of the celiac trunk. It can restrict blood circulation if the median arcuate ligament is located too inferiorly. Because of these changes patient complain of pain related to meals or accompanied by weight loss.
Case report: A 26-year-old female patient was admitted to Department of General, Minimally Invasive and Elderly Surgery in Olsztyn with history of 2 years lasting abdominal pain related to food intake. The patient has no comorbidities. Laboratory blood tests were unremarkable. The CT was performed which finally established the diagnosis. Median arcuate ligament caused 80% stricture of celiac trunk. The laparoscopic release was performed 20.02.2018. The surgery lasted 95 min without any complications. Patient reported total remission of the symptoms. Patient reported relief of symptoms in the first days after the operation. There were no postoperative complications. After two days of hospital stay patient was discharged. One and a half year after surgery CT was performed. CT scan shows total remission of stricture.
Conclusions: Dunbar syndrome has nonspecific symptoms, which makes it difficult to diagnose. The only way to complete the diagnosis is diagnostic of exclusion. Laparoscopic release of celiac trunk is a good method of treatment of Dunbar syndrome.
Key words: Dunbar syndrome, median arcuate ligament, laparoscopy, rare, follow-up.

Complex mitral insufficiency after minimally invasive mitral valve reconstruction – a case report

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Introduction: A left ventricular aneurysm (LVA) is an infrequent (5–10%) complication of myocardial infarction. Left ventricle (LV) geometry alteration may lead to secondary mitral valve insufficiency. Recent mitral valve insufficiency (MVI) management, depending on indications, includes medical treatment, transcatheter mitral valve repair and surgical replacement, or preferably reconstruction, whenever possible.
Case report: A 55-year-old male patient presented with a history of minimally invasive mitral valve reconstruction with ring annuloplasty using a 28mm LivaNova Memo 3D ring, 6 years ago, due to severe MVI secondary to inferior-posterior myocardial infarction and LVA. The mitral valve reconstruction was performed via mini-thoracotomy due to patient's preferences and the postoperative transesophageal echocardiography (TEE) revealed a good result. However, follow-up showed progressive LVA dilatation and moderate MVI. Moreover, patient's history was complicated with an incident of fever up to 41°C for 4 days. The blood cultures were negative and inflammatory biomarkers were within normal limits. The patient was treated with empirical endocarditis antibiotic therapy. Echocardiography revealed a severe MVI due to anterior ring dehiscence. Heart computed tomography (CT) revealed a dehiscence of the mitral annuloplasty ring, with a severe "paravalvular" leak through a planimetric area of 2.2 cm^2, as well as an enlargement of the LV aneurysm, but without evidence of endocarditis abscess. In this context, the indication for re-operation was applied, including mitral valve reconstruction with the previously implanted ring and aneurysmectomy. The postoperative TEE revealed a reconstructed mitral valve without residual insufficiency or stenosis (mean/max transvalvular pressure: 3/9 mmHg), and no LVA. The postoperative course was uncomplicated, the heart CT confirmed a good postoperative result and the patient was discharged for cardiac rehabilitation.
Conclusions: Although the initial minimally invasive mitral annuloplasty was successful, further dilatation of the left ventricular aneurysm led to the stress on the mitral annulus and, as a consequence, dehiscence of the mitral ring and tethering of the posterior mitral leaflet, with subsequent severe MVI. To conclude, mitral valve preservation should be always considered with maintenance of the leaflets and subvalvular apparatus function, as well as left ventricle geometry.
Key words: Minimally invasive mitral valve reconstruction, mitral valve insufficiency, left ventricle aneurysm, ring dehiscence.

Spontaneous rupture of a giant liver tumor as a life-threatening condition in surgery: case report

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Introduction: Liver tumors are significant diagnostic problems because of their large morphological diversity. Among them there are non-cancerous changes and benign or malignant tumors. The most common primary malignant tumor of the liver in adults is hepatocellular carcinoma (HCC). It is characterized by high morbidity and mortality rates. Main risk factors of HCC are cirrhosis and use of birth control pills. In 3-26% of cases, large primary liver tumors burst with spread of cancer cells into the peritoneum. 25-75% of patients die as a result of this complication. Location of the tumor determines the symptoms of bursting. Presentation of spontaneous rupture of liver tumor as a life-threatening and severe complication of HCC.
Case report: Clinical case of 43-year-old woman with ruptured giant tumor located in left lobe of liver, who underwent

urgent laparotomic procedure of containing the bleeding and planned left-sided hemihepatectomy. One of the most common methods of ruptured HCC treatment is liver resection surgery. This procedure is very useful in patients with functional liver and resectable tumors. Another appropriate management in this case is transcatheter arterial embolization (TAE). This method in hemodynamically unstable patients before laparotomy is the most appropriate approach. The surgery may be postponed when the patient is stable or it can be performed as an emergency intervention, but it is less common because of worse prognosis. Emergency liver resection could increase the risk of hemorrhagic shock resulting with hepatic decompensation. Categorizing patients requiring acute surgery is determined by their cardiopulmonary system and renal function, number of platelets > 100×10^9 and indocyanine green angiography. Surgeon's experience in liver surgery has a significant impact on emergency intervention effectiveness. Hemorrhagic complications and postoperative liver failure incidents observed in 3-8% of patients after major resections are associated with higher postoperative mortality rate.
Conclusions: Spontaneous rupture of the liver tumor is a life-threatening condition.
Key words: hepatocellular carcinoma (HCC), liver resection, transcatheter arterial embolisation (TAE), emergency surgery.

Is lung transplantation a viable treatment option for rare diseases? A case report of a patient with pulmonary vein stenosis

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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 unoperated adult patients.
Case report: This case report describes a 49 years-old patient with pulmonary hypertension in the course of primary pulmonary vein stenosis of multiple vessels, pulmonary artery stenosis, and hypoplasia of the pulmonary veins and arteries. Congenital malformation of the pulmonary arteries and veins of the right lung were accompanied by poor vascularization (pulmonary infarctions) and abnormalities of venous structures of the left lung. The patient has received successful balloon angioplasty of upper and lower left pulmonary veins. Further procedures were 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. The patient underwent double lung transplantation (LTx) as 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 four days after the procedure. 6-minute walk test results 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. However, bridging methods play an important role in the treatment plan. Although repeated procedures like angioplasty were a crucial part of therapy, only aggressive intervention such as LTx has resulted in good long-term clinical results in the patient.
Key words: congenital pulmonary vein stenosis, adult congenital cardiac disease, pulmonary hypertension.

Severe acute pancreatitis as a complication of endoscopic retrograde cholangiopancreatography (ERCP)

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Introduction: Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic method that evaluates the bile and pancreatic tract, as well as provides the opportunity to execute therapeutic procedures. This examination is invasive, which is why it is performed under strictly defined indications. The main ones are: cholestasis, suspected primary sclerosing cholangitis and bile or pancreatic ducts cancer. The overall complication rate is 6-12%, the most common are acute pancreatitis 4-10%, bleeding 1-2%, cholecystitis 0.2-0.5%.
Case report: 69 years old patient presented with abdominal pain and icterus was admitted to the Department of General, Minimally Invasive and Elderly Surgery in Olsztyn . Laboratory tests on admission indicated cholestasis. Abdominal ultrasound revealed stones within the gallbladder. On next day ERCP was performed, due to difficulties during bile duct cannulation operator decided to do a papillotomy. The next day pancreatic parameters increased. On the third day after ERCP patient's condition got significantly worse and led to acute pancreatitis. This condition led to respiratory and renal failure. The patient was transferred to the ICU, where the next day she died of cardiac failure.
Conclusions: Acute pancreatitis is the most common complication of ERCP, in majority mild 55-60% or moderately course 30-35%. The case illustrates the severe course of the disease leading to multiple organ failure and death, despite the fact that the patient did not have additional risk factors.
Key words: endoscopic retrograde cholangiopancreatography, severe acute pancreatitis, complication, post-endoscopic retrograde cholangiopancreatography pancreatitis.

Spontaneous rupture of a giant liver tumor as a life-threatening condition in surgery: case report

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Introduction: Presentation of spontaneous rupture of liver tumor as a life-threatening and severe complication of HCC. Clinical case of 43-year-old woman with ruptured giant tumor located in left lobe of liver, who underwent urgent laparotomic procedure of containing the bleeding and planned left-sided hemihepatectomy.
Case report: One of the most common methods of ruptured HCC treatment is liver resection surgery. This procedure is very useful in patients with functional liver and resectable tumors. Another appropriate management in this case is transcatheter arterial embolization (TAE). This method in hemodynamically unstable patients before laparotomy is the most appropriate approach. The surgery may be postponed when the patient is stable or it can be performed as an emergency intervention, but it is less common because of worse prognosis. Emergency liver resection could increase the risk of hemorrhagic shock resulting with hepatic decompensation. Categorizing patients requiring acute surgery is determined by their cardiopulmonary system and renal function, number of platelets > 100×10^9 and indocyanine green angiography. Surgeon's experience in liver surgery has a significant impact on emergency intervention effectiveness. Hemorrhagic complications and postoperative liver failure incidents observed in 3-8% of patients after major resections are associated with higher postoperative mortality rate.
Conclusions: Spontaneous rupture of the liver tumor is a life-threatening condition.
Key words: hepatocellular carcinoma (HCC), liver resection, transcatheter arterial embolisation (TAE), emergency surgery.

Reconstructive treatment of post-radiation extended ureteral stricture

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Introduction: Radiation therapy is one of the leading methods of conservative treatment of pelvic organs cancer. Often, spread of complications is due to high total doses and high reactogenicity of the surrounding tissues, which leads the spread of local long-term complications, among which the ureteric stricture is the most severe. Currently there is no established opinion in the literature about the optimal material and surgical technique for reconstructive surgery. In this clinical case, reviewing the technical features imposition of a vesical-intestinal anastomosis of patients with a high stenosis risk due to bladder radiation damage considered.
Case report: Patient L, 58 years old, 02/11/2019 patient was hospitalized in the Department of Urology, City Clinical Hospital No. 1 with a diagnosis extended stricture of the left ureter, hydronephrosis, left nephrostomy. according to history, palliative chemotherapy (PCT) was carried out since 1984 as well as radiation therapy for Hodgkin Lymphoma. Courses of PCT and radiation therapy are currently in remission. As patient said, in July 2018, she was admitted to City Hospital No. 29 with complaints of temperature and dull pain in the iliac region. Chronic pyelonephritis, left-sided hydronephrosis against the Introduction of post-radiation ureteric stricture were revealed. Based on MSCT contrast survey, left-sided hydronephrosis with stricture of the lower and middle third of the left ureter. Nephrostomy was performed. Then was planned hospitalization in GKB No. 1 for surgical intervention after correction of the upper urinary tract infection. Considering the ureter defect length and the pronounced scar-adhesion process as a result of radiation therapy, intestinal plastic of the left ureter was performed. MSCT was performed, which allows to verify good patency of the urinary tract.
Conclusions: Due to radiation damage patient bladder, a vesical-intestinal anastomosis was performed to the top of the bladder according to the end-to-side method with spatulation of the intestine end, which in our opinion reduces the risk of stenosis.
Key words: urology, reconstructive urology, Hodgkin lymphoma, vesical-intestinal anastomosis, ureteric stricture.

Individualised surgical treatment of an advanced gastrointestinal stomal tumour – case report

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Introduction: Gastrointestinal stromal tumours (GIST) are the most common mesenchymal gastrointestinal tract neoplasms. They usually localize in the stomach or small intestine, originating from the interstitial cells of Cajal, which play a crucial role in autonomous gastrointestinal movement. They represent a wide spectrum of changes ranging from small and benign to highly aggressive and massively metastatic. As the symptoms of GIST are non-specific, many patients do not seek proper medical help until the neoplastic process reaches its metastatic stage.
Case report: In this study we present a case of a 55-year-old woman, who was referred to our clinic with a 3-months history of discomfort in the abdominal region. PET-CT scan revealed massive neoplastic infiltration of the gastric wall, as well as peritoneal and hepatic metastases. Immunohistochemical staining of a tissue from a biopsied liver metastasis confirmed the presence of the markers characteristic for GIST including CD117 and DOG1. As a radical operation was not possible, continual chemotherapy with imatinib was administered, however, in two years' time, the neoplasm became immune to the medication and progressed.

Furthermore, control gastroscopy showed a spot of changed tissue on the inner surface of the stomach associated with the large, submucosal tumour. Second-line treatment with sunitinib was introduced, yet there were no signs of remission and CT revealed that a fistula in the damaged gastric wall has developed. In order to prevent the symptoms wedge resection of the stomach with primary tumour was performed. No complications were noted. After the surgery patient's condition improved and CT with contrast performed 3 months later confirmed further shrinking of the tumour.
Conclusions: GIST, while it might be asymptomatic, is a dangerous disease and may lead to serious complications. Effective therapy of such a condition requires balance between surgical and chemotherapeutical treatment. In similar case, salvage surgery might create a chance for the patient to return to the targeted therapy.
Key words: gastrointestinal stromal tumour, GIST, oncology, surgery, chemotherapy, palliative.

The ineffective endovascular treatment of giant internal carotid artery (ICA) aneurysm. Case report

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Introduction: We report a rare case of a giant recurrent aneurysm that was subsequently treated several times including coiling with stent implantation, two flow diverter (FD) stent implantation and hybrid neurosurgery.
Case report: A 65-year-old woman with visual disturbances in the right eye was diagnosed with a large unruptured aneurysm of a right ICA, in C6 segment. After standard preparation endovascular embolization (stent assisted coiling) was done. Control DSA performed after the procedure showed occlusion of the aneurysm with partial filing of the base of a sac (RROC IIIa). 1 year later control DSA revealed recanalization of the aneurysm sac and enlargement of the whole aneurysm. Complementary endovascular procedure was done – additional coils were placed into the aneurysm sac and flow diverter stent (FRED) was placed into previously implanted Leo stent. Control angiography showed a small filling with contrast stagnation at the base of the aneurysm sac (RROC IIIa). After 3 years she was admitted to the hospital due to worsening of the neurological condition. Control cerebral DSA showed recanalization of the aneurysm. Previously deployed coils were spread and dislocated. The patient was qualified for endovascular treatment with the use of another FD. In control DSA stent completely covered the neck of aneurysm, slow inflow of contrast into aneurysm sack was present, blood flow through right hemisphere was maintained. 3 months later the patient was admitted to hospital with symptoms of intracranial bleeding. CT revealed intracerebral bleeding in the right hemisphere, blood in ventricles with brain edema. Rupture of the aneurysm was believed to be the source of bleeding. The patient was qualified for hybrid vascular intervention. After clipping, control DSA was performed and contrast flow inside the right hemisphere was confirmed. After the procedure the patient in vegetative state was transferred to ICU and then to the health and care center.
Conclusions: Successful angiographic and clinical outcome was observed after all of four embolizations. Subsequent 'stent-in-stent' therapy should be considered as a treatment option in cases of recurrent giant aneurysms.
Key words: endovascular treatment, aneurysm, giant aneurysm.

A case of patient with basilar bifurcation aneurysm associated with persistent primitive hypoglossal artery (PPHA)

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Introduction: Persistent primitive hypoglossal artery (PPHA) is the second most common persistent carotid–vertebrobasilar anastomosis, with an incidence of 0.027-0.26%. Hypoglossal artery arises from the internal carotid artery (ICA) to join the vertebro-basilar system. PPHA change the hemodynamics of the carotid and vertebrobasilar system and may be associated with intracranial vascular anomalies.
Case report: We report a case of a female presented with photophobia and headache who was admitted to the Neurosurgery Unit with subarachnoid hemorrhage (SAH) from basilar artery aneurysm. Four-vessel angiography revealed right sided PPHA as a main supply to the vertebro-basilar system with ipsilateral hypoplastic vertebral artery. Wide-neck basilar artery bifurcation aneurysm was exposed. The initial segment of PPHA was cannulated using guiding catheter and 2 parallel microcatheters were placed concentrically into guiding catheter. Low-profile braided stent was delivered using first of microcatheters and placed partially in the right posterior cerebral artery (PCA) and partially in the basilar artery. The first of detachable microcoils was introduced using the second microcatheter. However, a single stent was not able to sufficiently secure the origin of the other PCA. Therefore, the left PCA was catheterized and the next stent was implanted to the left PCA and basilar artery (Y-Stenting). Control angiography revealed complete obliteration of the aneurysm (class I in the Raymond-Roy Occlusion Classification). The blood flow in the vertebrobasilar system was preserved. Postoperative transient visual impairment was observed within 24 hours. Nimodypin and triple H therapy was introduced. Symptoms completely subsided within 24 hours. Patient was discharged after 10 days after SAH and still remains symptom free for 12 months.
Conclusions: A correct diagnosis of the PPHA is crucial given its significant influence on the vertebro-basilar circulation and association with concomitant vascular anomalies. Patients with the PPHA will require in-depth analysis and pre-operative preparation. Hence, further investigation is needed to update our knowledge of carotid-basilar anastomoses.
Key words: PPHA, persistent primitive hypoglossal artery, basilar bifurcation aneurysm, carotid basilar anastomosis.

Congenital dysfibrinogenemia as a rare cause of recurrent gastrointestinal bleeding

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Introduction: Gastrointestinal bleeding is a common disease that surgeons encounter in everyday clinical practice. It is most often easy to diagnose and treat. However, rare causes of bleeding can lead to delayed diagnosis and ineffective treatment. Dysfibrinogenemia is a qualitative fibrinogen disorder in which functional fibrinogen level is reduced with normal or increased antigenic level.
Case report: A 59-year-old female was admitted to the Department of General Surgery after upper gastrointestinal bleeding episode. Later she was hospitalized several times in the Department of Internal Medicine due to recurrent episodes of severe anemia. On admission she complained about exercise tolerance deterioration, dizziness and general malaise. The patient's physical examination was generally unremarkable except for skin pallor. Laboratory testing showed severe anemia (HGB level 7.3 g/dl). Detailed imaging and endoscopic diagnostic revealed portal hypertension with a non-bleeding 1cm gastrointerstinal stromal tumor and multiple angiodysplastic lesions in the close proximity. Surgical treatment was considered but first the patient was referred for hematological consultation. Clottable fibrinogen concentration estimated with von Clauss method was 1.4 g/l (normal range 1.8-3.5 g/l) and fibrinogen antigen level determined nephelometrically: 3.8 g/l (normal range 1.8-3.5 g/l). The patient was diagnosed with dysfibrinogenemia. Due to tardive clinical symptoms onset acquired dysfibrinogenemia was considered first. However, fibrinogen concentration measured in the patient's daughter was also diagnostic for dysfibrinogenemia, which confirms the congenital character of this coagulation disorder. The patient was ordered to take tranexamic acid and iron supplementation. The patient was referred for observation in the hemophilia treatment center.
Conclusions: Recurrent idiopathic gastrointestinal bleeding remains a diagnostic challenge to the clinician and a constant threat to the patient. Although congenital bleeding disorder is a relatively rare cause of gastrointestinal bleeding, it should be ruled out in patients with chronic anemia.
Key words: dysfibrinogenemia, coagulation disorder, gastrointestinal bleeding, chronic anemia.

From sore throat to neck organs transplant

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Introduction: Necrotizing fasciitis (NF) is a fulminant advancing soft tissue infection characterized by widespread fascial necrosis, which can result in significant morbidity and even death. This condition requires prompt diagnosis and aggressive management with extensive surgical debridement and appropriate antibiotic coverage. Pyoderma gangrenosum (PG), in contrast, is a noninfectious inflammatory condition of the skin that typically does not require surgical management. Both conditions can present with extensive ulceration and tissue necrosis, and close clinical-pathologic correlation is required to make the appropriate diagnosis.
Case report: A 28-year old female presented to Primary Care with fever, sore throat, pain in the right side of the neck and weakness . She was initially diagnosed with bacterial angina and given parenteral antibiotics. Within 10 days, she developed necrotic-looking skin lesions extending on her neck. Her cervical area was swollen, tender and erythematous and she also had enlarged lymph node packet (cervical, axilary, inguinal). Despite the antibiotics, she continued to have persistent swinging fever so she was admitted to ER. Just on the second day after admission to hospital, positive peritoneal symptoms and edema of the labia were observed. The symptoms were accompanied by leakage of fecal contents from the wound after appendectomy. Changing the antibiotics did not improve the patient's condition. Finally patient had laparotomy with right hemicolectomy. During the days that followed, the area of neck skin involvement with multiple skin erosions expanded to engage the whole neck and the proximal part of the upper arm. Medical and surgical treatment for those conditions proved ineffective. Then, an attempt was made to qualify the patient for neck's organs transplantation in Oncology and Reconstructive Surgery Clinic in Gliwice. Despite the operation the patient died one day after the surgery.
Conclusions: The importance of understanding the pathogenesis, clinical features, and management of both conditions cannot be overemphasized. Aggressive management of PG with antibiotics and extensive surgical debridement will lead to large tissue defects with potential reconstructive challenges. On the contrary, treating NF with immunosuppressive therapy may worsen the condition. This case highlights how important it is to apply the basic principles of surgery into clinical practice and formulate a diagnosis on the basis of proper history, clinical examination, and investigations; it is crucial to reconsider the preliminary working diagnosis if an expected clinical response is not observed.
Key words: neck, organs transplant, necrotizing fasciitis, pyoderma gangrenosum.

Giant adrenal cyst: a diagnostic dilemma

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Introduction: Adrenal cysts are rare entities in the clinical world. Their incidence is reported at 0.06-0.18% in autopsy series; that too with a 3:1 proclivity towards females. They pose diagnostic conundrums to the surgeon due to the difficulty faced in localisation of the origin of the cyst. Usually adrenal cysts are less than 10cm in diameter and current recommendations suggest surgical treatment for cysts above 5cm in diameter. The biggest challenge in such a case is the likelihood of misdiagnosing the patient. Thus, complete history, careful workup and investigations are imperative for efficient management.

Case report: A 45-year-old male presented with chief complaints of fullness in the left side of the abdomen since the last 15 days. A policeman by profession with no history of diabetes or hypertension, he had no history of vomiting or weight loss. The patient was non-drinker with no history of drug abuse or trauma. He had no pets and no recent blood transfusions. Vital stats including pulse, BP and temperature were normal. Local examination showed no scar marks and no organomegaly. Umbilicus was pushed to the right side and there was a vague mass palpable in the left lumbar area which was dull on percussion. Patient's hematological investigations were all within normal limits and liver function tests were benign. Pancreatic amylase, creatinine, urea and serum cortisol, aldosterone were ordinary. Catecholamine estimation in particular was normal. Ultrasonography showed a huge heterogenous mass with cystic areas of 20 × 16.5 cm size in the left hypochondriac extending into the left flank. CT scan revealed a mass with hypotenuse attenuation, not enhanced by the product of Contrast and peripheral areas of curvilinear calcification. There was no anomaly demonstrated at the level of renal excretory cavities or ureters. Consent for nephrectomy, splenectomy and pancreatectomy allowed an exploratory laparotomy to be initiated via an incision from the xiphisternum till the left flank of the abdomen. A solid retroperitoneal mass of size 20 cm in diameter was found responsible for a clear mass effect, with the anterior movement of the pancreas, upward movement of the transverse colon and splenic flexure and compression of the left kidney inferiorly, till the extent that the kidney seemed folded upon itself. The mass was separated from the adjoining structures and removed enbloc.
Conclusions: The rarity of the condition makes it a diagnostic dilemma till the extent that the only possible approach is via exclusion. The condition is commonly confused with other retroperitoneal masses due to its low incidence and lack of characteristic features. Differentials to be excluded include giant renal cysts, parasitic hydatid cysts, cystic lymphangioma, pancreatic pseudocysts, urinomas, adrenal adenomas, pheochromocytomas or functional adrenal cortical tumours. Histologically adrenal cysts are vascular/endothelial, hemorrhagic/pseudocysts or epithelial/true adrenal cysts. Pseudocysts result from a haemorrhage, possibly post trauma, of an adrenal gland. An attitude caution is required when dealing with these because it can be present in a large range of lesions, both benign and malignant. Typically, logic dictates that the bigger the cyst, the higher the chances of complications; however this is only valid till there is no accompanying hormonal syndrome. Symptoms arise either due to the mass effect on neighbouring organs or by haemorrhages (intracystic bleeding due to increase in cystic volume) precipitating acute pain phenomena. Ultimately complaints of gastric compression such as dyspepsia, urinary disturbances may be observed. Faced with such ambiguous symptoms, it is usually palpation of the mass on local examination which prompts the clinician to consider adrenal cysts as a differential. After identification of the cyst, the next step in the therapeutic approach is the evaluation of its functional state. Laparotomy is gold standard in these cases but may be challenging with respect to the size of the mass and the blood amount. Treatment is influenced by three main factors: the functional status of the cyst, the malignant potential of the cyst and the complications potential (especially mentioned for large cysts, such as haemorrhage leading to hypovolemic shock and/or secondary infection leading to septic shock). Despite the lack of consensus on the therapeutic management of adrenal cysts, some recommendations exist. Surgical treatment is recommended if the cyst is functional, symptomatic, > 5 cm (at risk of complications), possibly malignant on imaging or haemorrhagic. In all other cases, conservative treatment and periodic follow-ups suffice. However, there exists no monitoring protocol as of yet.
Key words: adrenal gland, cyst, laparotomy.

A ball-like structure inside the heart. What can it be?

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Introduction: Renal cell carcinoma (RCC) is an aggressive tumour with a tendency to metastasize to distant organs. At the time of presentation, a quarter of RCC patients already have significant local kidney infiltration or distant metastases without any concerning signs or symptoms. An extensive workup with different imaging modalities is required for diagnosis and further decisions on oncological treatment.
Case report: A 62-year-old male, presented with 2L of ascites and a left renal mass. Decompression of ascites and subsequent embolisation of the renal mass was performed. A staging CT of the thorax and abdomen revealed nodular changes in the lungs and adrenal glands, as well as incidental findings of a PE and additional masses in the IVC and right atrium. A transthoracic echocardiogram showed a large mass in the right atrium; entering through the IVC lumen and extending into the right ventricle through the tricuspid valve during systole. Cardiovascular magnetic resonance showed infiltration of the whole IVC with involvement of the right atrium, which was described histopathologically as a tumour thrombus without invasion of the venous wall. The only curative option for that form of RCC was hybrid abdominal and cardiac surgery, with radical nephrectomy and resection of the suspected metastatic lesions.
Conclusions: A high index of suspicion is needed to establish a diagnosis of RCC, and a thorough workup is required in atypical presentations. A majority of RCC cases are detected incidentally, with almost 16% of cases involving the inferior vena cava and very rarely extending into the right atrium. It is suspected that the mass is a combination of tumour thrombus resulting from hypercoagulability due to the neoplasm. Multimodality imaging is crucial in planning the oncological treatment and the presence of a tumour thrombus sometimes requires extensive and hybrid operations. Further prognosis remains poor.
Key words: renal cell carcinoma, metastases, hybrid surgery.

Long lasting complications of cardiac surgery – a demanding treatment of the sternal dehiscence

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Introduction: Deep sternal wound infection (DSWI), following cardiac surgeries, is potentially life-threatening complication, because it can lead to mediastinitis, which entails longer stay in the hospital and higher mortality rate. The reported incidence of DSWI after operations with median sternotomy is 0.4-5%. In some cases multidisciplinary approach is required to provide effective convalescence. Current management involves wide variety of methods to properly heal DSWI including debridement, administration of culture-specific antibiotics, negative pressure wound therapy and plastic surgery procedures. In the presented case, the sternal wound was successfully filled with the abdominis rectus muscle flap.
Case report: A 61-year old Male was admitted urgently to the cardiac surgery department, due to STEMI recognition, in order to proceed coronary artery bypass grafting (CABG) surgery. Procedure was performed using the cardiopulmonary bypass and IABP was placed. After the operation dehiscence of the sternum occured, complicated by DSWI (coagulase-negative Staphylococcus and *Klebsiella pneumoniae*) and mediastinitis. It was applied with Vacuum Assisted Closure (VAC) therapy and culture-specific antibiotics were used. This treatment was continued for 4 months with 3 attempts of closing the sternum. After the third closure, a pedicled muscle abdominal rectus flap coverage was performed. Additionally patient was attending hyperbaric oxygen chamber sessions for 30 days. Over the course of several weeks the wound was fully healed.
Conclusions: It is important to consider all known risk factors which can be minimized in the best possible way. However, what is more valuable, the proper multidisciplinary treatment must be applied. An appropriate contribution might have both surgical and non-surgical procedures implemented in the right time. Nevertheless, reconstructive and plastic surgery techniques are often considered as an evidence-based medicine treatment.
Key words: cardiac surgery, postoperative complications; multidisciplinary treatment.

Synchronous rectal and lung cancer – a case report

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Introduction: Both colorectal cancer and lung cancer are two of the most common malignancies, according to WHO. They share proven association with cigarette smoking. Synchronous occurence of those two malignancies is rather rare and means both neoplasms are identified simultaneously or within six months interval.
Case report: A 63-year-old male patient presented with positive FOBT. Colonoscopy showed ulcerous mass in the rectum. Biopsy and histopathological examination revealed revealed a moderately differentiated adenocarcinoma (G2). CT of the abdomen showed a 16 mm lesion in the liver and biopsy confirmed it to be metastatic. Significantly enlarged lymph nodes of mediastinum and right hilum visible in chest CT scan suggested lung metastases of the rectal cancer. Both EBUS and mediastinoscopy were performed; histopathological examination of the samples helped to establish diagnosis of small-cell lung carcinoma (SCLC). PET-CT showed multiple metastases of the SCLC to the bones. The chosen treatment for rectal cancer – that is rectal resection combined with radiotherapy and FOLFOX chemotherapy regimen – did not stop the tumor from further progression – several metastases in the liver and the peritoneum were found in follow- up CTs. In terms of lung cancer, PE chemotherapy regimen was chosen as first- line treatment and despite initial regression of the tumor, the cancer recurred. Currently, the patiens receives palliative treatment.
Conclusions: This case proves that after diagnosing patient with one neoplasm, we cannot assume any further discovered lesions to be it's metastases and perforing histopathological examination is crucial for establishing a corect diagnosis and treatment plan.
Key words: synchronous neoplasms, colorectal cancer, lung cancer.

Hidradenocarcinoma – a rare carcinoma derived from sweat glands – case report

Marcin Kleibert

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Introduction: Malignant carcinomas of the eccrine sweat ducts, which are extremely rare, occur in approximately one in every 13,000 cased diagnosed in dermatopathology laboratories. Clinically they are reported as non-symptomatic, slow-growing nodules. These carcinomas occur mainly in the elderly people (50-60 years of age). These carcinomas are mostly localized on head and neck or torso. They locally aggressive – infiltrate surrounding tissue and metastasize to regional lymph nodes. In minority of cases distant metastases are diagnosed.
Case report: A 68 years old man was admitted to the department after radical resection of the skin lesion from the torso and lymphadenectomy. Primary tumor was diagnosed as hidradenocarcinoma and lymph node metastases were confirmed. The radical radiotherapy was administered (total dose of 60 Grays). After 3 months local recurrence was diagnosed. Multidisciplinary team referred patient for surgery. After next 1.5 years the distant metastases were detected. Despite the two lines of chemotherapy the patient died after 3 years from the primary diagnosis.
Conclusions: Quick and relevant diagnosis is the basis of treatment to the all types of sweat glands carcinomas. The patient's life expectancy depends on multiple prognos-

tic factors including size of primary tumour and its mitotic count. Patients should be referred to specialized skin-cancer center to receive optimal multidisciplinary treatment.
Key words: hidradenocarcinoma, sweat glands, carcinoma.

Thyroid anaplastic carcinoma and papillary carcinoma follicular type – which one is more aggressive?

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Introduction: Anaplastic thyroid carcinoma is the most aggressive tumor and the least common of all thyroid cancers, characterized by rapid growth with a median survival limited to months after diagnosis. On the other hand, papillary thyroid carcinoma and follicular thyroid carcinoma are generally indolent, with very few progressive cases.
Case report: A 64-year-old patient known with goiter for about 40 years but without endocrinological evaluation, presented with progressive dysphonia. Total thyroidectomy was performed. Histopathological examination revealed anaplastic thyroid carcinoma that associates papillary thyroid carcinoma follicular form. Post-surgery, CT scan described multiple cervical lymph nodes and two straight pulmonary nodules too small to be characterized. The patient received radioiodine therapy (June 2015) and external cervical beam therapy (July 2016). In March 2019, a PET-CT scan detected a left rib (C6-C7) tumor with high FDG activity - surgery was performed and papillary metastasis was confirmed. In August 2019, it was treated with a complementary dose of radioiodine. Bone scintigraphy and CT scan performed afterwards described another small, nonspecific rib injuries: secondary, post-traumatic or arthritic lesions. In this case, thoracic radiotherapy was postponed due to the high risk for secondary lung fibrosis and the uncertainty of secondary injuries. After iodine therapy, the values of thyroglobulin were undetectable both in suppression and without. In the future we will consider Sorafenib as a possible treatment option.
Conclusions: Most patients with anaplastic thyroid carcinoma present with a rapidly enlarging thyroid mass, and the majority die within six months of diagnosis. Our patient had a good, unexpected evolution for the anaplastic component but with secondary dissemination from the differentiated one.
Key words: anaplastic thyroid carcinoma, follicular thyroid carcinoma, papillary thyroid carcinoma.

Pus from the ear: a case of parotid abscess

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Introduction: Untreated parotid abscess may rupture and drain through preauricular skin and rarely through the ear canal. Untreated patients are at a risk of fasciitis, facial nerve palsy and deep head and neck abscess. This case illustrates unusual association of parotid abscess with Internal Jugular vein (IJV) thrombosis and right eye ptosis.
Case report: Case presentation – 50/F presented with purulent discharge from right ear and ear ache. On palpation a 4 × 4 cm right infra-auricular swelling was felt with purulent discharge from the right ear. Partial right eye ptosis was seen without any cranial nerve deficit. Investigations – investigations revealed neutrophilic leukocytosis with TLC 17200 cells/mm^3 (N 81.9%, L 12.4%, M 5.3%, E 0.3%). Her ESR was 32 mm/h. Otoendoscopy showed a fistula connecting the right parotid gland and external acoustic meatus. USG (Neck) showed large hyperechoic ill-defined lesion at the angle of the mandible. CECT (neck) suggested right parotid abscess and the right IJV thrombosis. FNAC revealed Methicillin sensitive *Staphylococcus aureus* (MSSA). Diagnosis – right parotid abscess. Treatment – empirical antibiotics were started as MSSA was isolated. Oral Vit-K antagonists were given to titrate INR. Her INR was kept in range with weekly monitoring. Discussion – parotid abscesses rarely drain from external auditory canal indicating brachial arch developmental anomalies. A patent Foramen Huschke (anatomic variation in the tympanic bone in 4.6% cases), is found in rare cases of otorrhea with salivary drainage from ear more commonly in females and on the right side. Here, pus discharge from the right ear of the female patient indicates a possible persistent Foramen Huschke. Right eye ptosis indicates probable involvement of autonomic fibres from superior cervical ganglion. IJV thrombosis probably resulted from inflammatory processes around IJV and extension of micro thrombi via retromandibular and facial vein.
Conclusions: Developmental variations can lead to uncommon presentations of common conditions like drainage of pus through the ear. Imaging should be done in neck abscesses to rule out neck vein thrombosis.
Key words: pus from ear, parotid abscess, foramen Huschke.

Mysteriously disappearing bilateral kidney tumors in a 37-year-old woman – a case report

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Introduction: Typical age of onset of kidney cancers is 45 years. Nevertheless, there is a number of mutations that increase the risk of early development of the disease. However, in

the case of young individuals we should always be aware of lesions that may mimic the cancer.
Case report: We present a case of a 37-year-old woman with a 26-year-long history of poorly controled type I diabetes mellitus. In early September 2019 she was admitted to the Department of Intensive Therapy in Franciszek Raszeja Hospital in Poznan. She suffered from diabetic ketoacidosis and complicated pyelonephritis (It is important to mention that the patient reported she had never contracted any UTI ever before). After the initial stabilisation she was transferred to the Department of Diabetology where her ailment was resolved. However, during an abdominal sonography two kidney lesions were found (one lesion on each side). In a CT scan both of them were contrast-enhancing and had irregular margins. After a urological and another radiological consultations the patient was referred to a radical left-sided nephrectomy and right-sided nephron-sparing surgery in the Department of Urology in Jozef Strus Hospital in Poznan. Three months later, during the admission, another abdominal sonography was performed. It did not show any abnormality. So did ultrasound examinations performed by two other urologists who consulted their observations with a radiologist. The operation was canceled and the patient was discharged home. A control MRI scan performed one month later did not show the lesions, either.
Conclusions: The presented case shows the importance of control sonography on admission. Since no histopathological sample was obtained, definitive diagnosis could not be made. However, the retrospective analysis suggests, the lesion probably was an inflammatory pseudotumor.
Key words: inflammatory pseudotumor, cancer mimic, dissapearing tumor.

Hemichorea caused by hyperglycemia

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Introduction: Hemichorea is a hyperkinetic syndrome that can be caused by lesion of the contralateral striatum. Most common causes are vascular and metabolic disorders. A few cases are described in the literature where it can be the first manifestation of type 2 diabetes. This clinical case is a rare example of hemichorea associated with lesion in putamen induced by nonketotic hyperglycemia. Complete symptom remission is achieved by controlling blood glucose levels.
Case report: A 58-year-old male was admitted to Emergency Department in Pauls Stradins Clinical University Hospital with complaints of sudden onset of involuntary movements in his left arm and leg, which progressed within a week. Physical examination revealed choreoathetosis in the left arm and leg, the rest of the neurological evaluation was unremarkable. Laboratory findings showed blood glucose level of 22 mmol/l upon admission to the hospital, glycated hemoglobin was 16.5%. Patient was diagnosed with type 2 diabetes for the first time. MRI showed lesion in the striatum on the right side (prominent changes could be seen in MRI T1 sequence, which showed hyperdense lesion in putamen region). Clonazepam was given for symptomatic therapy and blood glucose level was managed with insulin, metformin. With decrease of blood glucose the hyperkinetic movements reduced. When the patient was discharged, complete symptom remission was not yet achieved. On follow-up 4 months later, the patient showed no signs of pathological movements, blood glucose was 8.0 mmol/l. The symptoms had disappeared completely, however hyperdense changes in the striatum of MRI T1 scan remained.
Conclusions: This case shows an example of hemichorea as the first manifestation of type 2 diabetes. Diagnosis was based on unilateral basal ganglion lesion, contralateral clinical manifestation and high blood glucose level. Furthermore, reduction of symptoms with blood glucose correction confirms the diagnosis. Hyperglycemia should be considered in patients with hemichorea. Early diagnosis, treatment and diabetes management is significant for a fast, complete recovery.
Key words: hyperglycemia, hemichorea, putamen.

Metachronous neoplasms as a challenge of modern oncology – a case report of a patient with lung adenocarcinoma with metachronous invasive lobular breast cancer

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Introduction: Breast cancer is the most common malignancy in terms of incidence in women (22%). Lung cancer takes 3rd place (9%). We observe this neoplasms individually in everyday practice, but the concomitance of lung adenocarcinoma and breast cancer, with different pathogenetic origin is a rare finding. This phenomenon, called multiple primary malignant neoplasms is becoming a great challenge of modern oncology.
Case report: A 68-year-old patient was admitted to the Clinic due to the diagnosis of left lung EGFR (+) adenocarcinoma (44 mm lesion, approximately 11 mm aortic lymph nodes). Patient was qualified for afatinib treatment. As a part of the treatment process CT was regularly performed. 6 months after the beginning of treatment CT revealed decrease in tumor size to 28 mm and a decrease in lymph nodes to < 10 mm. At the same time lesion in the right breast was detected. The mammogram was commissioned and no abnormalities were found (BIRADS 0). Further diagnostic revealed a suspicious lesion (BIRADS 4b/4c) in ultrasound examination. A core needle biopsy was performed and invasive lobular breast cancer was detected. 1.5 months after diagnosis, patient underwent a right breast tylectomy. In intraoperative lymph node biopsy no metastases were found. Currently the patient is being treated with afatinib as detection of second primary malignant neoplasms is not an exclusion criteria.
Conclusions: Metachronous neoplasms, however rare are becoming increasingly frequent phenomenon. Vigilant diagnostic process and supervision are required to detect and differ second primary neoplasm from metastases, what enables to start appropriate treatment. It also requires increased patients education about cancer and the prevention

of these diseases, because the presence of one cancer does not exclude the appearance of another malignancy. Watchful, holistic attitude enable quick detection of new lesions and may significantly increase overall survival and improve quality of patients life.
Key words: lung adenocarcinoma, breast cancer, metachronous neoplasms, oncology, afatinib.

A case of a 35-year-old male with hypereosinophilic syndrome originally manifested by abdominal pain and followed by multiple thromboembolic complications

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Introduction: Hypereosinophilic syndrome (HES) is one of rare, myeloproliferative disorders associated with peripheral eosinophilia defined by absolute eosinophil count > 1.5 x 10^9/l on at least two blood test 1 month apart and/or profound eosinophilic tissue infiltration followed by direct organ damage/dysfunction. HES incidence is app 0.4 per 1 million people and affects more commonly male. Clinical manifestation depends on involvement of particular organs. HES is progressive disorder and may lead to significant complications with a possible fatal outcome.
Case report: 35-year-old male who was admitted to the A&E Department due to persistent abdominal pain, fever and emesis. The patient was transferred to the Surgery Department and underwent exploratory laparotomy due to possible inflammatory tumors intra-abdominally (WBC 19.43 × 10^9/l, CRP 300.6 mg/l, initial eosinophil count 2.052 × 10^9/l). Two tumors involving the greater curvature of the stomach and the transverse colon wall with extensive eosinophilic infiltration were found. 4 days after the surgical procedure clinical manifestation of crus deep veins and portal vein thrombosis followed by acute pulmonary embolism occurred. Chest tomography revealed saddle embolism. Laboratory findings were consistent with disseminated intravascular coagulation (DIC) and the eosinophil count spiked to 33.62 × 10^9/l, total IgE > 2500 IU/ml. Patient was immediately transferred to the Cardiology Department for intensive treatment. Unfractionated heparin was administered. Consequently, the patient suffered from a major stroke with secondary hemorrhagic transformation and developed hemiplegia. Diagnostic workup revealed no evidence of haematopoietic or lymphoid malignancies as well as parasitic infection. Genetically tested patient was found FLIP1L1, PDGFRA, JAK-2, BCR-ABL1 negative. Immunosuppressive (steroids) and supportive (multiple platelets, red cells and plasma transfusions) treatment were introduced. After 6 six weeks, the patient successfully recovered with no significant neurological deficit or cardiac dysfunction. The 5-year follow-up evaluation patient remained symptom-free and his subsequent medical history was uneventful.
Conclusions: HES is a highly uncommon but important medical condition due to its serious and sometimes rapid clinical complications. It requires careful differential diagnosis and appropriate treatment based on individual clinical presentation.
Key words: eosinophilia, hypereosinophilic syndrome, DIC.

Acute abdomen syndrome as a result of gastrointestinal tuberculosis – a case report

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Introduction: Tuberculosis is a potentially fatal infectious disease caused by *Mycobacterium tuberculosis* that most often affects the lungs. Due to swallowing the infected sputum, the disease may also occur in the gastrointestinal tract. This form may lead to intestinal obstruction, which symptoms include severe abdominal pain, vomiting and constipation.
Case report: On 4th October 2019, a 39-year-old man was admitted to the Surgery Department due to vomiting and acute abdominal pain. Medical history revealed severe stomachache for about two weeks. Also, the day before admission vomits occurred each time after meals. The physical examination revealed planked abdominal pain, painful at palpation, lack of peristalsis and cachexia. Laboratory tests showed elevated inflammatory markers. The abdominal and pelvic CT showed obstruction, most likely caused by a torsion of the intestine. The patient was tested for HIV infection – the result was negative. Due to signs of gastrointestinal obstruction, the exploratory laparotomy was performed, where the nonspecific nodules in small intestine suggested differential diagnostics for Crohn's disease and intestinal tuberculosis, so a variable lymph node was taken during the procedure. No mechanical obstacle was found to be the cause of the obstruction. Chest X-ray showed specific lesions for tuberculosis, so sputum for microbiological examination was collected. Due to the symptoms and signs characteristic for both pulmonary and intestinal tuberculosis the anti-tuberculosis treatment was implemented. The culture was positive for *Mycobacterium tuberculosis* in sputum. No mycobacteria were found in the collected nodes. The patient was transferred to the reference centre in Otwock where the further treatment was performed.
Conclusions: It should be remembered that in addition to classical pulmonary tuberculosis, extrapulmonary can occur e.g. intestinal form. Intestinal tuberculosis can manifest as bowel obstruction. Immunodeficiency predisposes to tuberculosis. It should be taken into account that malnutrition is one of the causes of immunodeficiency.
Key words: tuberculosis, infectious disease, malnutrition.

Diagnostic dilemmas in a patient with controversial histological subtype of gastric cancer

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Introduction: Gastric linitis plastica is a diffuse cancer characterized by a rigidity of the stomach wall. These tumors tend to infiltrate the submucosa and muscularis propria, and consequently superficial mucosal biopsies may be falsely negative. Therefore, detecting the extent of the spread and depth of the cancer can be difficult endoscopically. In most typical cases, the cells appear in a signet-ring form.
Case report: A 56-year-old woman was admitted with abdominal pain, nausea, altered bowel habits, and coffee ground vomiting. The patient's past medical history included pancreaticoduodenectomy for a chronic pancreatitis in 2000, type 2 diabetes, and chronic bronchitis due to long-term smoking. The patient underwent 4 gastroscopies. Initially, endoscopy showed only mucosal inflammation of the stomach. Endoscopy-guided biopsy samples selected at random from the stomach wall were acquired, and histopathological examination revealed carcinoma mucocellulare G3. Endoscopic biopsies were re-performed to verify the diagnosis, and a poorly cohesive carcinoma was confirmed. The patient was referred to Warsaw for further diagnostics. During surgery, intraoperative biopsies showed inflammation only with no evidence of dysplasia, and a decision was made not to proceed with resection. These tissue samples were re-analyzed by pathomorphologists in Poznań, who felt that microscopic changes are in fact consistent with the initial diagnosis of cancer. The patient subsequently underwent gastric resection.
Conclusions: This case presented significant diagnostic challenges, including a surgically altered anatomy, non specific complaints, and conflicting pathology of gastric cancer. It demonstrates how in medicine an acute diagnosis is often decided by a combination of elements, of which the human factor plays an important role. Endoscopic evaluation, accurate biopsies and precise histopathology were crucial in the detection of cancer in our patient, and in guiding treatment.
Key words: gastric cancer, linitis plastica, gastric resection.

Pharmacy and Laboratory Medicine

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POLSKIE TOWARZYSTWO FARMACEUTYCZNE

List of papers:

Evaluation of ligand efficiency indices in the group of multifunctional ligands, derivatives of purine-2,4-dione

Sofiia Rakuta

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Introduction: Lipophilicity is one of the most important physicochemical properties frequency used in QSAR (quantitative structure-activity relationship) analysis. Lipophilicity of drug candidate can effect both the pharmacokinetic and pharmacodynamics properties, in particular, the ability of a molecule to cross the cell membrane depends on its partition coefficient.
Aim of the study: The aim of studies was to evaluate of ligand efficiency indices in the group DMLs based on a purine-2,4-dione core.
Material and methods: A group of 27 compounds – DMLs based on a purine-2,4-dione core, were synthesized in the Department of Medicinal Chemistry of Jagiellonian University Medical College. Relative lipophilicity parameters were determined by RP-TLC (Reversed Phase Thin Layer Chromatography) method. Lipophilicity was also predicted by computational approaches (in silico) using the ACD/ChemSketch, VCCLAB and ChemAxon MarvinJS. LLE index was calculated according to Leeson Springthorpe Eq.
Results: The obtained RM0 values are in the range of 1.1296-3.0552. The lowest value of the RM0 coefficient was determined for the compound Az 579na, while the highest value of RM0 is characterized by the compound Az 565. In the next stage of the research, the relationship between logP values obtained by RP18-TLC method and theoretically calculated. The theoretically obtained values differ significantly from the corresponding experimental values. No satisfactory linear correlation was found for any of the three computer programs. LLE parameters were calculated for both serotonin receptors and LELP, BEI and PEI. The most optimal values of individual parameters are characterized by the compound Az 560, for which the LLE is above 5 for both serotonin receptors and LELP is in the range from –10 to 10.
Conclusions: All evaluated derivatives of purine-2,4-dione based on "lipophilicity" get the chance to become an oral drug with respect to their bioavailability. It was founded that for three of the compounds, the pharmacological activity increases with increasing lipophilicity. The optimal values of LLE were obtained for compounds Az 560, 561 i 563 and those could be treated as potential drug candidates.
Key words: lipophilicity, designed multiple ligands (DMLs).

New triazine derivatives as potential 5HT6 receptor ligands – in silico studies

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Introduction: The 5-HT6 receptor is the most recently identified member of the 5-HT receptor superfamily. The 5-HT6 receptor is involved in affective disorders, anxiety, depression, epilepsy, and obesity. Although many ligands of this receptor were obtained, none of them went successfully through clinical trials. Main reasons are insufficient ADMETox properties. Previously found 5-HT6 agents showed little chemical diversity, which strongly emphasizes the need to explore new chemical spaces. Recently, 1,3,5-triazine derivatives were identified as a new chemical family of potent 5-HT6 ligands. Previous studies described in vitro ADMETox properties for active 5-HT6 ligands. Based on those results, 14 new triazine derivatives were designed.
Aim of the study: Aim of this study was an estimation of in silico ADMETox and physicochemical properties for new triazine derivatives in comparison to results of in silico and in vitro assays, performed for previously found active 1,3,5-triazine derivatives.
Material and methods: 14 new triazine derivatives (7-20) were designed. Then, the comprehensive evaluation of ADMETox and physicochemical parameters, using computational approaches, was carried out for previously found active compounds (1-6) and new triazine derivatives (7-20). Their physicochemical properties were tested using pkCSM, SwissADME, ChemDraw. Selected ADMETox properties were checked using various computational methods e.g. pkCSM. Obtained results were analysed for the compounds, with respect to both groups, and compared to results from in vitro research for compounds 1-6.
Results: Three of fourteen compounds (7, 16, 19) showed favorable in silico "drug-like" properties, such as good absorption from the gastrointestinal tract, BBB permeability, lack of carcinogenic and mutagenic effects. On the basis of in silico results, the compounds are probable to be a substrate of CYP3A4. New triazines (7-20) have poorer water solubility and higher log P value than previously found active compounds (1-6).
Conclusions: Basing on obtained results, compounds with the highest drug-like properties are 7, 16 and 19. Thus, synthesis and biological evaluation of them will be performed in the next step.
Key words: 5-HT6 ligands, 1,3,5-triazine, in silico research.

Stimulated production of triterpenoids in the mycelial culture of *Fomitopsis betulina*

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Introduction: *Fomitopsis betulina* is one of the well-known species of wood-decay mushrooms used for years in folk medicine. Several groups of compounds are responsible for their medicinal properties; one of them is triterpenoids. A broad spectrum of biological activities, including antiallergic, hepatoprotective and anti-tumor activity, characterizes betulin and its derivatives.
Aim of the study: The study aimed to investigate the effect of the addition of unsaturated fatty acids on pentacyclic triterpenes accumulation in *Fomitopsis betulina* biomass.

Material and methods: The object of the study was the mycelial cultures of *Fomitopsis betulina*. Mycelial cultures were maintained for ten days in the liquid Oddoux medium with our modifications. On the first and sixth day of the experiment, linoleic acid and oleic acid were added in the amount: 0.5, 1, 1.5 and 2 g/l of the culture medium. Using the DAD-HPLC method pentacyclic triterpenes (betulin and betulinic acid) were quantified in isopropanol extracts from obtained biomass.
Results: Among the tested fatty acids, linoleic acid was proved to be the most effective in enhancing total triterpenoid production. With an addition of 1.5 g/l on the 6th day, the production of total triterpenoids was increased by 40% compared to the control.
Conclusions: The study proves that the use of linoleic and oleic acids as stimulators of the metabolic pathway of terpene compounds increased their accumulation in the obtained biomass. The stimulation of mycelial cultures can be proposed as a biotechnological method of obtaining bioactive metabolites under study.
Key words: medicinal mushrooms, mycelial cultures, fatty acids, supplementation.

NLX-240, a functionally selective 5-HT1A receptor biased agonist, does not affect short- and long-term memory in mice

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Introduction: As the population ages, the number of people suffering from memory disorders increases. Scientists are still searching for more effective treatments. Currently, the focus of interest is upon the serotonergic system and biased agonism. Biased agonists preferentially activate receptor subpopulations and specific signaling pathway, not affecting or even blocking another response.
Aim of the study: Our study aimed to test the influence of three functionally selective 5-HT1A agonists (NLX-265, NLX-240, and NLX-249) on short-term and long-term memory using the novel object recognition test in mice.
Material and methods: We used adult male Albino-Swiss mice (CD-1). After administration with studied compounds or saline (*p.o.*), we placed mice separately in experimental cages containing two identical objects. Mice were left there until the total time of the exploration of two objects was the 20 s, but no longer than 10 min. After 15 min (short-term memory) or 24 h (long-term memory), we placed mice again in the cages, except that one object was switched for a new one. Mice were left in the cages until the total time of the exploration of two objects was the 20 s, but no longer than 10 min as previously. In this case, we measured the novel object exploration time. All experimental procedures were approved by the I Local Ethics Committee for Experiments on Animals of the Jagiellonian University in Krakow, Poland.
Results: We proved that only NLX-240 did not interfere with the memory formation in mice – they spent more time exploring the new object than the familiar one. We observed short- and long-term memory impairment when we used other compounds.
Conclusions: NLX-240 as a functionally selective 5-HT1A biased agonist is a promising compound in treatment mood disorders without influencing memory processes.
Key words: 5-HT1A receptor, biased agonism, functional selectivity, novel object recognition.

Comparison of the release of phenolic compounds from various forms of *Curcuma longa* species into artificial digestive juices

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Introduction: *Curcuma longa* is a species belonging to the ginger family (*Zingiberaceae*). It is widely cultivated in the southern and southwestern region of Asia. *C. longa* occupies an important place in the cuisines of Iran, Malaysia, India, China, Polynesia and Thailand. Curcumin was isolated from *C. longa* in 1815. Curcumin belongs to the polyphenolic compounds, it is the most important compound and component of the yellow colored spice obtained from the rhizomes of this plant. It has been used in Ayurvedic medicine to relieve inflammation, as well as to treat infectious and autoimmune diseases. Based on scientific research, it has been shown that curcumin can inhibit the division of cancer cells and the process of angiogenesis (and thus prevent the development of vascularization of cancer cells). Curcumin also inhibits the proliferation of cancer cells by inducing apoptosis, or programmed cell death. It is also one of the most potent antioxidants. Many scientists emphasize the potential of curcumin in the prevention of cancer.
Aim of the study: The aim was to compare the content of phenolic acids in the raw material and after extraction using artificial digestive juices in the artificial digestive tract model from preparations obtained from various forms of turmeric – fresh rhizome, dried patches and powder.
Material and methods: Origin of tested *C. longa* raw material: powder from India, fresh rhizome from China and dried slices from India. The tested material was subjected to homogenization and then extracted with artificial digestive juices in the Gastroel-2014 apparatus, which imitates the conditions in the human digestive tract. Then, phenolic compound content was analyzed using the RP-HPLC method.
Results: The highest amounts of tested phenolic compounds were determined in dried patches, then in powders, while the smallest amounts were found in fresh rhizome. The determined compounds were best released from the preparation in powder form.
Conclusions: Curcumin has a broad spectrum of biological activity not only at the cell level, but also at the whole orga-

nism level. Interesting is its antitumor effect. The analysis shows that the release of the determined compounds was most beneficial in the case of *C. longa* in the form of powder.
Key words: curcumin, phenolic acids, *Curcuma longa.*

Development of pharmaceutical gummies as a novel chewable dosage form intended for paediatric use

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Introduction: Pharmaceutical gummies are the formulations based on gelatine, that can be administered orally without the need of water. This dosage form is very convenient and acceptable by patients, especially children, thus can lead to higher compliance in this population. Therefore, pharmaceutical gummies can be an attractive alternative to tablets, capsules, and syrups containing drugs such as ibuprofen or ketoprofen intended for paediatric patients. Gummi pastilles can be chewed or bitten acouple times before being swallowed, which can also be helpful for patients with swallowing problems.
Aim of the study: The aim of our study was to formulate pharmaceutical gummies as a novel paediatric dosage form, containing ibuprofen as a model active pharmaceutical ingredient
Material and methods: The base formulations of pastilles were composed of gelatine, sucrose syrup, maltitol and water. Obtained solutions were mixed with different amounts of ibuprofen (to give 50, 100 or 200 mg of ibuprofen dose per unit) and then poured into silicone mould. After solidification and conditioning in dryer, mechanical parameters of gummies were evaluated using texture analyser Shimadzu EZ-SX. Disintegration time was measured with pharmacopoeial apparatus for tablets. The dissolution test was performed with an apparatus type II in 900 ml phosphate buffer pH = 7.2 for 60 minutes. The samples after filtration were assayed with UV-VIS spectrophotometer Shimadzu, UV-1800.
Results: Texture and mechanical properties of prepared gummies depended on the amount of plasticizer, and were good in the case of placebo formulations as well as those containing ibuprofen. The values of disintegration timeranged from 32 to 56 minutes. After 60 minutes more than 80% of ibuprofen was dissolved from all formulations.
Conclusions: The results of our study confirmed, that there is a technical possibility to formulate the gelatine-based gummies containing ibuprofen as a model active ingredient. Optimization of the stability and palatability of the ibuprofen gummies will be the aim of the further studies.
Key words: ibuprofen, gelatine-based gummies, paediatric patients, palatability.

Evaluation of the ability of polymeric materials used to store and administer parenteral nutrition mixtures to protect against UV-VIS radiation

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Introduction: Parenteral nutrition is a form of nutrition therapy aiming to provide patients with the essential nutrients by the intravenous route, in case the nutrition via the gastrointestinal tract is impossible, insufficient or contraindicated. Mixtures for parenteral nutrition include carbohydrates, fats, amino acids, electrolytes, water, trace elements and vitamins. The nutritional admixtures are o/w emulsions with very limited physical, chemical, and microbiological stability. Lipid peroxidation products, which can be formed as an effect of admixture exposition to the light radiation, may lead to oxidative stress in the patient's body. Unfortunately, there is no research characterizing in detail light protective effect of the materials used for parenteral nutrition.
Aim of the study: The aim of our study was to evaluate the UV-VIS barrier properties of polymeric materials used for storage and administration of parenteral nutrition admixtures, i.e. ethyl vinyl acetate (EVA) or multilayer bags, syringes, syringe connectors, infusion tubings and protective covers.
Material and methods: Transmittance (%T) and reflectance (%R) of all evaluated polymeric materials were measured with UV-VIS spectrophotometer Shimadzu UV-1800 in the range of λ = 200-1100 nm. The scanning electron microscopy (SEM) method was used to analyse the structure of the tested materials, as layered structure and thickness uniformity.
Results: The values of the transmittance and reflectance measurements were collected and correlated with images taken by scanning electron microscope. The light-barrier properties of polymeric materials depended on their construction (number of polymer layers and their structure), density, colour, thickness, and chemical composition.
Conclusions: The results of our study have shown significant differences in light protective properties of studied materials. These can lead to a different grade of peroxidation of vitamins and lipids in parenteral admixtures, depending on the storage and administration materials used. It is particularly significant in the case of parenterally fed premature infants, who are very susceptible for the peroxidation products because their antioxidative mechanisms are immature.
Key words: parenteral nutrition, lipid peroxidation, vitamins degradation, premature infants, nutrition admixtures, polymer properties.

The role of the VGLUT1 transporters in brain ischemia and the influence of CSB6B its expression

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Introduction: Stroke is a leading cause of death and disability with limited treatment options. Excessive release of glutamate (Glu), excitotoxicity, is the main mechanism of neurodegeneration during and after cerebral ischemia. Glu is the most widespread neurotransmitter in the central nervous system. Under some pathological conditions the extracellular concentration of Glu is increased, leading to the neuronal injury. Moreover, the over activation of glutamate transporters might cause necrosis or apoptosis. There are several intracellular transporters for Glu which mediate the process of glutamatergic neurotransmisssion e.g. vesicle glutamate transporters (VGLUT isoforms 1-3) which participate in glutamate accumulation in secretory vesicles. The role of VGLUTs remains unclear in stroke. VGLUT1 is the most widespread vesicular Glu transporter.
Aim of the study: Thus, the aim of the experiment is to investigate the role of VGLUT1 in brain ischemia through its inhibition by Chicago Sky Blue B6 (CSB6B).
Material and methods: In the experiment, firstly, we have induced brain ischemia by 90 min middle cerebral artery occlusion (MCAo) in Sprague Dawley rats. CSB6B was administered using stereotaxic frame (5 µg, i.c.v.) 2 hours after reperfusion, to inhibit VGLUTs. Next, neurological deficit was measured by Bederson scale. Secondly, 24 hours after MCAo the brain structures (dorsal striatum, hippocampus, frontal cortex) were isolated and prepared for further analysis. The expression of VGLUT1 was detected by Western Blot technique.
Results: The outcomes showed that VGLUT1 expression has changed after in vivo induced ischemic stroke in rats. Treatment with CSB6B modulated the expression of VGLUT1 as well as reduced the brain infarct and neurological deficit.
Conclusions: The results suggest that VGLUT1 play an important role in increased release of Glu during the brain ischemia. Therefore, VGLUTs may be a novel target for stroke treatment in the future.
Key words: stroke, ischemia, VGLUTs, vesicle transporter, glutamate.

Structure-based search for potential thymidine phosphorylase inhibitors as anticancer agents

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Introduction: Thymidine phosphorylase (TP) plays an important role in tumor progression. TP via phosphorolysis of thymidine increases level of 2-deoxy-D-ribose (2DDR). The increased level of 2DDR is connected with overexpression of angiogenesis factors, such as: vascular endothelial growth factor, integrins and interleukin-8. Moreover, excessive level of thymidine phosphorylase protects cancer cells from apoptosis by increasing nucleoside metabolism. Therefore, inhibitors of thymidine phosphorylase are described as potential anti-neoplastic agents.
Aim of the study: The aim of our study was to find potential thymidine phosphorylase inhibitors. Virtual screening was applied for hit selection, and their biological activity was tested in vitro.
Material and methods: Search for new thymidine phosphorylase inhibitors was carried out using virtual screening. First, ZINC database was screened to find analogues of known TP inhibitors. Selected compounds were downloaded as mol2 files and docked to the active site of the previously prepared TP (crystal structure PDB code: 4EAD). Docking was performed with GOLD software and standard parameters were applied. Results were visualized with PyMOL. For selected ligands QikProp module was used to evaluate physicochemical properties. Compounds were sorted according to the properties and the ones with MW < 500, HBD < 5, HBA < 10, logP < 5 were selected. The chosen hits were bought and tested in vitro using spectrophotometric method. Solution containing tested compound, phosphate buffer and enzyme was taken. Absorbance was measured before and after adding the substrate. The test allowed to detect inhibitors for which IC50 values were calculated.
Results: The virtual screening allowed us to obtain 4 active compounds. In the first step, ZINC database was searched to find structural analogues of known TP inhibitors, 17 000 compounds were obtained. In the next step, all of them were docked with GOLD software. The binding mode of ligands with GoldScore value higher than 76.00 was inspected visually. QikProp module enabled us to choose compounds with required physicochemical properties. Finally, 39 ligands were selected. Among them, 7 hits were bought and tested in vitro. We noticed that 3 compounds showed micromolar biological activity comparable to the reference inhibitor 7-deazaxanthine.
Conclusions: The in silico and in vitro studies allowed us to obtain new thymidine phosphorylase inhibitors. The selected compounds will be developed in the ongoing project.
Key words: thymidine phosphorylase, inhibitor, virtual screening, ZINC database, in vitro assay.

Screening of endosulfan and its metabolites toxicity *in vivo*

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Introduction: Endosulfan, an organochlorine insecticide, is an environmentally persistent pesticide because of its lipophilic nature. It poses health problems for people and is toxic for aquatic animals including fish. Endosulfan is a pesticide still widely used in many developing countries. It is applied to crops like cashew, tea, cotton in India and China despite laws banning it.

Aim of the study: In the present study we compared xenoestrogenic properties of endosulfan and its metabolites. We used molecular docking to study the receptor-binding affinities of endosulfan and its selected metabolites to a number of zebrafish and human receptors (hERα, hERβ, fERα, fERβ, GABA-A and GABA-B). As a next step, the toxicity of the selected compounds was tested on zebrafish embryos (wild type, ABxTL, Danio rerio).
Material and methods: All studied substances, including: endosulfan alpha and beta, endosulfan lactone, endosulfan ether, endosulfan alcohol were tested at a final concentration of 10 µg/l. For the control group we used E3 and 10 µg/l DMSO. 20 embryos per plate were exposed to all the solutions from 24 to 96 hours post-fertilization (hpf).
Results: Endosulfan beta at 10 µg/l concentration led to 100% mortality in the first 24hpf. The other compounds did not cause mortality. However, endosulfan alcohol delayed slightly development of the embryos and led to multiple intestinal lipid accumulations. After 3 days of exposure, endosulfan alcohol delayed hatching as compared to reference (17 out 20 fishes were hatched). None of the studied compounds influenced the movements of embryos (24hpf), heart rate or fish length.
Conclusions: Endosulfan beta was proven to be the most toxic at 10 µg/l concentration. Whereas endosulfan alpha, endosulfan lactone, endosulfan ether, endosulfan alcohol did not have significant adverse effects on development of zebrafish embryos. Molecular docking did not reveal higher binding affinities for endosulfan alpha and beta. Thus, endosulfan beta mechanism of toxicity is not connected to xenoestrogenic properties. The high toxicity of encodings beta could be due to oxidative stress as suggested in other studies.
Key words: zebrafish, endosulfan, pesticide, molecular docking.

Hypotensive drugs impact the induction of humoral immunity by macrophages from mice fed with high-sodium diet

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Introduction: Excessive sodium intake and inflammatory processes have a large share in the pathogenesis of hypertension, one of the intensively developing civilization diseases. Moreover, in patients with hypertension, a dysfunction of immunological cells is observed.
Aim of the study: The impact of high-sodium diet and hypotensive drugs on a humoral immunity induction is poorly understood. Therefore, our study was aimed at estimating their influence on the macrophage-mediated humoral immunity.
Material and methods: Mice fed with high-sodium chow were treated with hypotensive drugs (propranolol – 10 mg/kg; captopril, carvedilol, verapamil – 5 mg/kg, amlodipine – 3 mg/kg, olmesartan – 1 mg/kg) for eight days. During drug administration, peritoneal exudate was induced by injection of mineral oil. The obtained macrophages were immunized with a corpuscular antigen and transplanted into naive mice. The recipients' splenocytes and blood were collected 7 days later and used to the plaque forming assay (PFA) and haemagglutination test to assess the humoral response to a specific antigen.
Results: A high-sodium diet has no significant effect on the immune response. On the other hand, hypotensive drugs, especially captopril and carvedilol, enhanced the macrophages-mediated humoral response.
Conclusions: The obtained results show that humoral immune response to a specific antigen was stronger under influence of drugs. Immunomodulatory properties of hypotensive drugs, especially those affecting the macrophages' functions might be useful in the treatment of inflammatory diseases.
Key words: hypotensive drugs, high-salt diet, immune response modulation, macrophages.

Drug-likeness properties and chemometric analysis of mono- and tri-heterocyclic azole derivatives with anticancer activity

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Introduction: The discovery and development of new anticancer drugs are quite complex and time-consuming tasks. In past decades researchers have been trying to minimize the number of trial-and-error experiments in certain stages of drug development by analysing and interpreting already obtained experimental results by using chemometrics. It has been shown that chemometrics is a useful tool in the early stages of drug development. Quantitative Structure-Activity Relationship (QSAR) analysis, as one of the main chemometric approaches, is based on the correlation between molecular descriptors and biological activity.
Aim of the study: The aim was to determine the correlation between physicochemical properties i.e. water solubility and antiproliferative activity estimated by the MTT assay in the series of synthesised compounds.
Material and methods: In this study, 14 derivatives of mono- and tri-heterocyclic azole derivatives, synthesized in Department of Medicinal Chemistry UJ CM were investigated by analysing their physicochemical properties which are important indicators of the ADMET (Absorption, Distribution, Metabolism, Excretion and Toxicity) profile of a compound. Molecular weight, lipophilicity (LogP), the number of hydrogen bond donors, hydrogen bond acceptors and rotatable bonds and polar surface area (PSA), polarizability and water solubility (LogS) were obtained via the free web tool, SwissADME. Next, these molecular descriptors were compared to existing and verified benchmarks that define lead-like, drug-like and known drug chemical spaces. Finally, relationships between molecular descriptors and antiproliferative of studied compounds have been assessed.
Results: Physicochemical properties of investigated compounds meet the criteria of drug-likeness. Statistical analysis of relationships between molecular descriptors and antiproliferative activity against a panel of different human cancer cell lines (IC50, SW480, SW620, PC3, HaCaT, V79) highlights existing correlations.

Conclusions: Analysis of molecular descriptors allowed the defining of studied compounds in various chemical spaces. Performed analysis has enabled to identify the lead-like structure for antiproliferative activity.
Key words: chemometric analysis, drug-likeness, lead-likeness, antiproliferative activity.

Analysis of Copper-binding ligands in rufinamide synthesis

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Introduction: Rufinamide (1-[(2,6-difluorophenyl) methyl]-1H-1,2,3-triazole-4 carboxamide) is an anticonvulsant medication used to treat various seizure disorders developed in 2004 by Novartis Pharma. This was the first drug to ever be used in treatment of Lennox-Gastaut syndrome – a rare, complex and severe childhood-onset epilepsy and is now one of only 5 drugs used in its treatment. The drug stands outs with its unique structure including a 1,2,3-triazole ring. It is synthesized using copper(I)-catalyzed alkyne-azide cycloaddition (CuAAC), one of the "click reactions", described by K. B. Sharpless in 2001: high yielding and simple to perform. Rufinamide synthesis has been extensively studied, but the influence of copper-chelating ligands on the efficacy of the alkyne-azide cycloaddition between 2-(azidomethyl)-1,3-difluorobenzene and methyl prop-2-ynoate has not been studied yet.
Aim of the study: The aim of this work is to test the efficacy of copper-chelating ligands for Rufinamide synthesis. With current environmental pollution in mind, we also aim to find more environmentally-friendly solutions.
Material and methods: We studied the CuAAC reaction between 2-(azidomethyl)-1,3-difluorobenzene and methyl prop-2-ynoate using various copper-chelating ligands. The studies on CuAAC at our Department, provided basis for an efficient catalyst screening protocol using 1H NMR and LC-MS to determine product purity and reaction yield. The copper-chelating ligands used in the protocol include TBTA and THPTA developed by Sharpless, as well as AMTC (2-{4-[(Dimethylamino)methyl]-1,2,3-triazol-1-yl}cyclohexan-1-ol) and other ligands developed at our Department. Apart from the ligands, various solvents and other reaction parameters are considered, bearing in mind their environmental impact.
Results: Analysis of the aforementioned reaction has shown the most useful ligands for Rufinamide synthesis on the basis of yield and product purity.
Conclusions: The research will allow us to understand the role and importance of copper-chelating ligands, opening new pathways to more successful and environment-friendly synthesis of Rufinamide.
Key words: Rufinamide, synthesis, optimazation, ligands, ATMC.

What factors influence the quality of life of Polish pharmacists the most? Questionnaire study with usage of The Short Form (36) Health Survey

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Introduction: Due to the possibility to rate different aspects of the quality of life (QoL) the Short Form (36) Health Survey (SF-36) questionnaire has been consistently used by clinicians to assess outcomes of therapeutic procedures. It may also be applied to assess QoL of healthy people.
Aim of the study: To apply Sf-36 survey to evaluate the quality of life of Polish pharmacists with regard to gender, BMI and age.
Material and methods: The Polish pharmacists were asked to fill in the SF-36 questionnaire online. The key of professor Jan Tyłka (the higher the score, the worse QoL) was utilized to analyze the results. The results were divided into 2 major domains (physical and psychical QoL) and 8 minor domains and analyzed.
Results: 765 pharmacists (660 women) answered the questionnaire. Men had better total QoL ($p = 0.03$) and physical QoL ($p = 0.02$) compared to women. The Kruskal-Wallis test showed significant age-related variance ($p < 0.05$) for total QoL, physical QoL and all minor domains exccluding pain, general health and emotional status. Respondents aged 51-60 had the highest median score in every category. There was a weak correlation between age and physical quality and moderate correlation between age and physical functioning. BMI was associated ($p < 0.05$) with differences in total QoL, physical and mental quality, and all minor domains except for emotional role limitation, emotional state and general health. Comparing normal weight people and pharmacists with too high body weight, the latter had worse outcomes in total QoL, physical QoL and all minor domains but emotional role limitation and emotional state. People with normal BMI had significantly better QoL in all fields excluding emotional role limitation compared to the obese (BMI > 30) ones. Significant differences were noted between overweight and obese respondents – the former had better total QoL, physical QoL and several minor domains.
Conclusions: All tested factors have a significant impact on quality of life. BMI appears to be the most important one, having a serious influence on virtually all aspects of QoL. We believe that further research of QoL of various healthcare workers might identify fields of work most detrimental to QoL and tackle strategies to improve it.
Key words: pharmacy, quality of life, SF-36, BMI, obesity.

Cytoprotective effects of cinnamic acid derivatives on normal cells – *in vitro* study

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Introduction: Cinnamic acid (CA) derivatives, both isolated from plant sources and synthesized, are well known for their antioxidant, antitumor, antimicrobial, antifungal and cytoprotective properties in neurodegenerative diseases. On the other hand in CA derivatives group we can find substances that possesses cytotoxic and anti-cancer activity. In our group we previous proved that two CA derivatives – compound 1 and 2 have interesting chemosensitizing activity against DOX treated lung cancer cells. To date, we do not have data on the safety of these substances, however, in the literature, structural analogues of our compounds showed interesting cytoprotective activity. The aim of this work was to investigate safety profile of CA derivatives as well as their potential cytoprotective effect on normal cells.
Aim of the study: The aim of the study was to evaluate cytoprotective effect of two cinnamic acid derivatives (compound 1 and 2) on murine macrophages, lung fibroblasts and cardiomioblasts with menadione and hydrogen peroxide – induced damage.
Material and methods: RAW murine macrophages, MRC lung fibroblast and H9c2 cardiomioblast cell lines were used in the study. Cells were treated with analyzed compounds (1, 2) for 1 hour and then menadione and hydrogen peroxide were added to induce cell damage. Ability of CA derivatives to prevent cellular stress was evaluated using MTT test and ROS Glo assay. Quercetine – natural compound with favourable protective activity was used as reference standard.
Results: Results of the study show that analyzed compounds (1,2) possess cytoprotective activity on cells treated with menadione and hydrogen peroxide. Both compounds prevent cell death and oxidative stress induced by menadione and hydrogen peroxide. The activity of compound 1 was more profound than compound 2. The best cytoprotective activity of 1 and 2 was observed in cardiomiobalst model.
Conclusions: Analyzed CA derivatives have favourable cytoprotective activity, but further analyses are needed to evaluate specific mechanism of their action.
Key words: cinnamic acid, oxidative stress, cytoprotection.

Synthesis and study of maleimide and isoimide linkers as tools for protein functionalization

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Introduction: Chemical modification of proteins has many biological and medical applications. These include enhancement of protein stability in biological systems, diagnostic methods and creating protein-drug combinations as exemplified by antibody-drug conjugates (ADCs) such as Adcetris (brentuximab vedotin). Due to the complex structure of proteins, appropriate selectivity of connections is important. Such possibilities are provided by the thiol group -SH, which is a fragment of the amino acid cysteine.
Aim of the study: The aim of our work was to obtain maleimide and isoimide linkers, previously not described in the literature, and to study their reactivity with cysteine-containing peptides. In order to study linker reactivity, glutathione was used as a model peptide containing a thiol group in its structure.
Material and methods: To obtain the linkers, the reaction of amines with maleic anhydride was used, which depending on the conditions, leads to the formation of maleimide or isoimide derivatives. The reaction of glutathione with thus obtained linkers was carried out under conditions for thia-Michael reaction. The thia-Michael reaction consists in the addition of a thiol compound to an α, β-unsaturated carbonyl compound, thanks to which a carbon-sulfur bond is created. The thia-Michael reaction is an example of the "click-chemistry" concept, described by Sharpless in 2001. To determine the structures, purity and yield of the obtained compounds, 1H NMR spectroscopy and liquid chromatography with mass spectrometric detection (LC-MS) were used.
Results: The synthesis of linker molecules was clean and efficient. The reactions of linkers with glutathione produced various products, including disubstituted glutathione derivatives, obtained using an isoimide linker.
Conclusions: The performed studies allowed to obtain linkers for glutathione functionalization, as well as to assess difficulties in the synthesis and purification of these compounds. Obtained linkers can be used to determine the concentration of glutathione and thus to study oxidative stress.
Key words: maleimide, "click-chemistry", glutathione functionalization, thia-Michael reaction.

A study on polypharmacy and drug interactions among elderly hypertensive patients admitted in a tertiary care hospital

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Introduction: Polypharmacy may be defined as the effects of taking multiple medications concurrently to manage coexisting health problems, such as diabetes and hypertension. Polypharmacy is an important issue in elderly patients.
Aim of the study: To assess polypharmacy and drug-drug Interactions among elderly hypertensive patients.
Material and methods: A cross-sectional study was conducted in the rural tertiary care teaching hospital in Central India over 2 months. A total of 100 patients were studied. The study population included hypertensive geriatric population above 65 years admitted in the medicine ward who were willing to consent for participation. The patients with incomplete case sheets admitted in the Emergency and Intensive Care Units and with serious illness, malignancy, and other complications were excluded.

Results: Out of the total 403 medicine prescribed to study population, 271 potential drug–drug interactions were observed among elderly hypertensive patients. Moderate drug–drug interaction was found to be most common (50.62%) followed by mild (8.64%) and severe (7.94%). Most common potential inappropriate medicine used was spironolactone followed by diltiazem, diclofenac, olanzapine, metoclopramide, digoxin, insulin, and isopto hyoscine (Sliding scale) in the study population.
Conclusions: In the present study, we can conclude that polypharmacy is a major risk factor for secondary morbidity in elderly patients. Polypharmacy leads to more potential drug–drug interactions and potential inappropriate medicine use. The use of medicines to disease condition is necessary, but unnecessary load of drugs to patient will increase the safety problems. Polypharmacy can be avoided by sharing treatment goals and plans. To improve drug safety in this high-risk population, appropriate prescribing might be more important than simply reducing the number of prescribed drugs.
Key words: drug–drug interaction, elderly hypertensive, polypharmacy.

Recent advances in ophthalmic drug delivery

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Introduction: Ophthalmic drug delivery has always been a challenge to the pharmacologists. Various static and dynamic barriers make it difficult to target the drug to the intraocular tissues at the desired therapeutic level. Despite easy external access from ocular surface, only 1-5% drug is bioavailable. The problem lies more with delivering the drug to the posterior segment as compared to the anterior segment.
Aim of the study: The focus of this study is on the recent advancements that address the above stated issues and could be the future of ocular medicine.
Material and methods: The study was made by reviewing the available literature and the speeches and interviews made by ophthalmologists on international platforms. Also, a survey was made that included 50 participants which was aimed at understanding what problems are faced by the patients with the existing ocular drugs.
Results: 30 participants were reported to have faced minor and major ophthalmic morbidities. The most highlighted issues with current medications reported by the participants were frequent dosing and noncompliance. The most preferred route of administration selected by the patients was topical as it is easier and less invasive. The newer techniques being developed focussed on resolving these issues include nanomedicine, microemulsions, hydrogel formulations, soft contact lenses and many more.
Conclusions: The evolving drugs are a promising stage to increase the residential time of the drug, targeted release, improve penetration and enhance bioavailability. This would result in more patient friendly drugs and reduce the dosing frequency and risk of toxicity. The advances are being made to treat anterior as well as posterior segment diseases. Although the attempts must be made to prepare these drugs in the form of eye-drops to make it more comfortable and acceptable to the patients.
Key words: bioavailability, ocular drugs, posterior segment.

The effect of salidroside on dopaminergic genes expression in the hippocampus of rats with induced alcohol tolerance

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Introduction: Alcohol addiction remains one of the main issues in the developing countries. Alcohol changes expression of dopamine receptors in the brain, influencing on reward system. It's a cause of alcohol tolerance occurring. In our experiment we use the rats hippocampus, which is important part of limbic system. Salidroside (Sal) is the main bioactive compound from Rhodiola rosea and has potential neuroprotective properties. The access to clinically effective drugs in the treatment of addictions is currently limited. The lack of therapeutic options forces us to seek new substances. The substances of plant origin seem to be an interesting alternative.
Aim of the study: Evaluating the mRNA level changes for dopaminergic receptors in the hippocampus of rats with induced alcohol tolerance under the influence of Sal. Determining the effect of salidroside on the course of alcohol tolerance.
Material and methods: Wistar rats were divided into two control groups (receiving H_2O or ethanol (30%; 3 g/kg m.c./1 × day/7 days; i.p.)) and four Sal administered groups [(9 days: 4.5 or 45 mg/kg, p.o.) with H_2O or ethanol, i.p.)]. A total RNA from the hippocampus was isolated. Changes in mRNAs levels for Drd1, 2, 4 and 5 genes were measured by using quantitative real-time PCR technique. GAPDH gene was proposed as housekeeping gene.
Results: In the case of mRNA of Drd1, 4 and 5 transcripts the level was significantly increased, especially at lower dose (for a higher dose this effect was not statistically significant). The effect of Sal on Drd2 gene expression occurred for both doses regardless of the solvent used.
Conclusions: Ethanol inhibits expression of mRNA of dopaminergic receptors 1,4 and 5. Salidroside eliminates the negative effects of ethanol because of increasing the expression of D1, D4 and D5. It is not clear whether its molecular activity took place by direct action via D1-D5 receptors causing observed transcriptional profile or led to this process indirectly. More complex pharmacological studies are required.
Key words: alcohol tolerance, salidroside, hippocampus, reward system.

Is there a link between high-fat prenatal diet and mental disorders development in offspring? The study on the influence of prenatal and early life high-fat diet exposure on the general locomotor activity and velocity in the offspring

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Introduction: Diminished locomotor activity in laboratory rodents is usually associated with mental disorders like depression and anxiety. The recent findings indicate a link between the high-fat maternal diet (HFD) and the mental health disorders in the offspring.
Aim of the study: The goal of the study was to determine general locomotor activity in the offspring exposed prenatally and in early life to HFD.
Material and methods: Wistar dams were fed with the HFD or normal chow (control group) three weeks before matching, during pregnancy and lactation. Next, we investigated the velocity and the locomotor activity in the open-field test in juvenile (28-day old) and adult (70-day old) male and female offspring.
Results: Both velocity and locomotor activity were strongly diminished in the HFD group in juvenile male offspring and normalized in adult male rats. No changes in the female group were found.
Conclusions: The obtained results indicate that maternal diet influences the locomotor activity and velocity in the male offspring group. Those changes in behavior might be an early sign of risk for mental disorders in children of mothers on HFD during pregnancy and lactation. In addition, the results suggest that female offspring are more resistant to the impact of maternal diet on the locomotor activity than males.
Key words: maternal diet, locomotor activity, offspring, a high-fat diet, mental disorders.

Assessment of awareness of deprescribing amongst doctors of tertiary care hospitals in a developing country

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Introduction: Deprescribing, the basic component of good prescribing practices is the systematic review and reduction of dose or complete cessation of drugs intended for chronic use following a risk-benefit analysis whilst remaining in congruence with the patient's quality of life and economic circumstances. Deprescribing is a crucial pillar in matters of growing concern about polypharmacy and drug cascading.
Aim of the study: This study was planned with the aim to explore the knowledge of prescribers about deprescribing and their willingness to adopt the concept. Currently, no deprescribing criteria is officially required to be applied across India.
Material and methods: A validated PACPD-12 Questionnaire on Deprescribing was filled by the doctors working in a Departments of a tertiary care hospital as a pilot study. Following this and additions of certain niche questions, a larger scale study was launched via distribution of online questionnaires across India. Data was collected and recorded on Microsoft Excel 2019 spread sheet and assessed by descriptive analysis.
Results: Out of the surveyed doctors, 55% were previously unaware of the term 'deprescribing' and a 100% believed there existed a lack of awareness on the topic in the medical community. Most agreed that deprescribing was beneficial in the current clinical scenario whilst 25% expressed a neutral stance in the same. Steroids, Benzodiazepines, antibiotics and Proton pump inhibitors were the most preferred drugs for deprescription and the most prevalent reason cited was to protect the patient from adverse drug reactions. 65% doctors did not use any specific criteria for deprescription however 90% of them expressed being amenable to following set guidelines on the same. The biggest barrier to deprescribing was reported to be the current doctor being unsure of the rationale behind previously prescribed medications by other doctors. Lack of experience (25%) and resistance from the patient (30%) was also outlined. A resounding 75% agreed that advanced age and comorbidities affecting drug metabolism made the physician more likely to deprescribe.
Conclusions: It was the first time that the prevalence of deprescription was assessed at a government tertiary healthcare centre. This study concludes that there exists a lack of awareness of the concept stemming from a lack of representation in the degree curriculum and absence of department set criteria for deprescribing. The biggest hurdle was identified as a lack of information on the rationale behind previously prescribed medicines. Following the identification of this gap, the primary concern is to now assess which criteria sits the best in the Indian clinical scenario. Application and adherence of the same may be ensured by introduction of training sessions and orientations holding the incentive of achieving CME credits.
Key words: deprescribing, polypharmacy, PACPD-12.

Does the prenatal and early life high-sugar diet exposure influence the general locomotor activity and velocity of the offspring?

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Introduction: Recent literature data have shown that prenatal exposure to high-sugar and/or high-fat diet may predispose offspring to develop mental disorders later in life. Changes in locomotor activity in laboratory rodents usually accompany mental disorders such as anxiety and depression.
Aim of the study: In the presented study, we examined if maternal high-sugar diet during pregnancy and lactation affects general locomotor activity in juvenile and adult offspring in both males and females.

Material and methods: The Wistar dams were fed with a high-sugar diet (HSD) or standard chow (control group) three weeks before matching, during pregnancy and lactation. Next, we investigated the velocity and the locomotor activity in the open-field test in 28 and 70-day-old offspring.
Results: Both velocity and locomotor activity were strongly diminished in the HSD group in 28-day-old male offspring and slightly increased in 70-day-old male rats. No changes were detected in the female group.
Conclusions: Together, these findings indicate the influence of maternal diet on the offspring locomotor activity and velocity and those changes in behavior might be an early sign of risk for mental disorders in children of mothers on the high-sugar diet during pregnancy and lactation. The results suggest that male offspring are more vulnerable to the impact of maternal nutrition on the locomotor activity than females.
Key words: a high-sugar diet, velocity, locomotor activity, mental disorders, maternal diet.

Evaluation of Candida Score: a bedside scoring system for early antifungal therapy in non-neutropenic critically ill patients

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Introduction: Invasive candidiasis is a common fungal infection, associated with high mortality, especially in ICUs. Prompt initiation of appropriate antifungal therapy has been shown to reduce mortality. But early diagnosis is difficult, due to it's variable and non-specific clinical manifestations. Also the criteria for starting empirical antifungal therapy are poorly defined. Thus, Leon *et al.* built *Candida* Score on the basis of four predictors of proven invasive *Candida* infection and demonstrated a significant linear association between increasing values of the *Candida* Score and the rate of invasive candidiasis. Such a score could be useful to stratify the risk of proven *Candida* infection and differentiate patients who would benefit from early antifungal treatment from those for whom invasive candidiasis is highly improbable.
Aim of the study: i) To evaluate the relationship between the presence of invasive candidiasis and the *Candida* Score value at the onset of severe sepsis or septic shock; ii) to analyse the initiation of antifungal therapy in relation with *Candida* Score value.
Material and methods: This is a prospective, observational, cohort study, conducted for 2 months. The components of *Candida* Score are sepsis, total parenteral nutrition, surgery and multifocal *Candida* colonization. Sepsis was given score 2, if present and 0, if absent. The other variables were given score 1, if present and 0, if absent. *Inclusion criteria:* Patients admitted to the ICU with: age > 18 yrs, sepsis. *Exclusion criteria:* Patients who are neutropenic, age ≤ 18 yrs, pregnant, nursing, on antifungal treatment. Relevant samples were screened for candida colonization twice weekly. The clinico-epidemiological information was recorded on a pre-designed report form.
Results: 78 patients were admitted in the ICU. The prevalence of candidemia was 23.1%. *Candida* was also isolated from urine (69.57%), endotracheal aspirate and sputum (13% each), and BAL fluid (4.3%). Prevalence was maximum in the age group – 60-69 yrs (42.31%). 6 patients had a *Candida* Score ≥ 2.5, of which 4 were having a score of 3, followed by 1 each having scores 4 and 5. Of them, 4 received antifungal treatment. 1 with score > 3 succumbed to death, without having antifungal treatment.
Conclusions: Our study suggests linear and significant association between increasing values of *Candida* Score and rate of candidiasis. Early identification of candidiasis with *Candida* Score may help initiate antifungal interventions and help the treating physicians formulate more effective treatment algorithms and decrease the mortality associated with invasive *Candida* infection.
Key words: *Candida*, score, bedside, candidiasis.

Evaluation of "Candida Score": a bedside scoring system for early antifungal therapy in non-neutropenic critically ill patients

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Introduction: Candidemia is a common fungal infection, associated with high mortality, especially in ICUs. Prompt initiation of appropriate antifungal therapy has been shown to reduce mortality. But early diagnosis is difficult, due to it's variable and non-specific clinical manifestations. Leon *et al.* built *Candida* Score on the basis of 4 predictors of candidemia and demonstrated a significant linear association between increasing values of the score and the rate of candidemia. This score could be useful to stratify the risk of proven candidemia and identify patients who would benefit from early antifungal treatment.
Aim of the study: i) To evaluate the relationship between the presence of invasive candidiasis and the *Candida* Score value at the onset of severe sepsis or septic shock; ii) to analyse the initiation of antifungal therapy in relation with *Candida* Score value.
Material and methods: This is a prospective, observational, cohort study, conducted for 2 months. The components of *Candida* Score are sepsis, total parenteral nutrition, surgery and multifocal *Candida* colonization. Sepsis was given score 2, if present and 0, if absent. The other variables were given score 1, if present and 0, if absent. *Inclusion criteria:* Patients admitted to the ICU with: age > 18 yrs, sepsis. *Exclusion criteria:* patients who are neutropenic, ≤ 18 yrs, pregnant, nursing, on antifungal treatment. Relevant samples were screened for candida colonization twice weekly. The clinico-epidemiological information was recorded on a pre-designed report form.
Results: Sample size was 78. Prevalence of candidemia was 23.1%. *Candida* was also isolated from urine (69.57%), endotracheal aspirate and sputum (13% each), and BAL fluid (4.3%). 6 patients had a *Candida* Score ≥ 2.5, of which 4 were having a score of 3, followed by 1 each having scores 4 and 5. Of them, 4 received antifungal treatment. 1 with score > 3 succumbed to death, without having antifungal treatment.

Conclusions: Our study suggests linear and significant association between increasing values of *Candida* Score and rate of candidiasis. Early identification of candidiasis may help initiate antifungal interventions and help the treating physicians formulate more effective treatment algorithms and thus decrease the mortality.
Key words: *Candida*, score, bedside, candidiasis.

Validation of LC-MS/MS method for simultaneous measurement of meropenem and linezolid in cerebrospinal fluid

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Introduction: Monitoringof therapeutic antibiotics concentration in cerebrospinal fluid (CSF) can be useful in clinical treatment of central nervous system infection in patients undergoing neurosurgical procedure. Accurate and precise method of antibiotics measurement is needed.
Aim of the study: The aim of the study was to validate LC-MS/MS method for simultaneous measurement of meropenem and linezolid in CSF.
Material and methods: Leftovers CSF samples from the clinical laboratory at the University Children's Hospital in Krakow were used to ensure proper matrix for standards and QC samples. Liquid chromatography tandem mass spectrometry (LC-MS/MS, Agilent Technologies 6460 Triple Quad) was used for measurement of meropenem (Mero) and linezolid (Lin) concentrations in CSF. Based on pooled CSF samples calibrators containing Mero and Lin at the concentrations of each: 0.1; 0.25; 0.5, 1; 2.5; 5; 10; 25; 50 µg/ml and three QC samples (0.75; 3.75; and 30 µg/ml) were prepared. Each calibrator was spiked with internal standards and deproteinized using 0.1% formic acid in acetonitrile. After mixing for 30s, samples was centrifuged (10000 RPM for 5 min, 4°C). Supernatant was mixed 1 : 1 (v : v) with 0.1% formic acid.5µl of sample was directly injected into a C18 column (Aquasil C18 100 × 3.0 mm, Thermo Scientific, heated to 30°C), eluted with the 0.1% formic acid and 0.1% formic acid in acetonitrile in a gradient mode (flow rate 0.4 ml/min.). Multiple reaction monitoring (MRM) transitions were measured in the positive ion mode with precursor-product ion pairs m/z: 384.16→141.1 for Mero and m/z 390.2→147.1 for the ISMero d-6 and m/z 338.15→296.1 for Lin and 341.01→297.2 for the ISLin d-3 were used for quantification. The study was approved by the Jagiellonian University Bioethics Committee (Protocol No. 1072.6120.291.2019).
Results: The method has been fully validated in terms of selectivity, linearity, recovery, accuracy, precision and stability. Between peak area response and drug concentration linear relationship in the range of 0.1-50 ug/ml for both Mero and Lin has been obtained. Coefficient of correlation was over 0.97. The percentage recovery for both antibiotics (Mero and Lin) was between 85-115%. The relative standard deviation (%RSD) for each QC sample ranged 5.0-9.3% and reproducibility was 8.0-14.4%.
Conclusions: The proposed method offers a fast and simple way for meropenem and linezolid determination in CSF.
Key words: LC-MS/MS, validation, CSF, meropenem, linezolid.

The effect of disinfecting procedure on the glucose concentration measurement using a personal glucose meter

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Introduction: Personal glucose meters, primarily designed for self-control of glucose concentration in patients with diabetes, are frequently used in clinical practice as point-of-care equipment. Recommended by the producer of personal glucose meters procedure of washing hands with water and soap before testing, in hospital wards is often difficult to fulfill and is replaced by disinfecting the place of blood sampling with isopropyl alcohol.
Aim of the study: The purpose of the research was to evaluate the effect of different disinfecting procedures on glycemia measurement in capillary blood using personal glucose meters.
Material and methods: Measurements of glycemia were taken in each of 50 volunteers using Accu-Check Performa (Roche, Swiss) glucose meters and using a procedure of disinfection with isopropyl alcohol and waiting for the disinfectant to evaporate (group B), immediate puncture after disinfection (group C) and after washing hands with water and soap and drying them (group A – control).
Results: Paired T-test showed no statistical significance between groups A/B 95% CI (–4.282 i 0.322), $p = 0.09$. Correlation between groups A/C showed statistical significance 95% CI (–7.842 i –2.917), $p = 0.00006$.
Conclusions: No statistically significant difference was observed between the control group and a group in which the blood sample was taken after the disinfectant has evaporated. Differences between the control group and the group in which the sample was taken immediately after disinfection are statistically significant but clinically unsignificant.
Key words: personal glucose meters, disinfectant, glucose concentration, POCT.

Free fatty acid receptors agonists affect colon permeability

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Introduction: The family of Free Fatty Acid Receptors (FFARs), specific G protein-coupled receptors consist of four members: FFAR1-4, where each responds to different chain length fatty acids (FAs). It was reported that ligands of those receptors may reduce inflammatory states, thus FFARs have become a potential new target in inflammatory bowel disease (IBD). IBD is a heterogeneous disorder characterized

by chronic, relapsing, inflammation in the gastrointestinal tract. The disease is not fatal but is very debilitating with a wide range of symptoms. One of them is secretory diarrhea, which occurs when secretion of water and electrolytes into the intestinal lumen exceeds its absorption. Thus restoration of this process in IBD patients could be beneficial as the chronicity of symptoms leads to decrease in patient's quality of life.
Aim of the study: The aim of this study was to evaluate the effects of FFAR1-4 agonists on colon permeability among groups comprising healthy control and 3% Dextran Sulfate Sodium (DSS)-treated mice.
Material and methods: Male c57 mice were randomly divided into control group and group administrating 3% DSS in drinking water. DSS group was treated intraperitoneally (i.p.) with FFAR agonists. Colon permeability was examined using Ussing Chambers and measuring the concentration of fluorescence substance (FITC-dextran).
Results: Colon permeability to FITC-labeled dextran was increased in DSS-treated mice at 60, 80, 100, and 120 min after the addition of the probe to the mucosal chamber, comparing to controls. Treatment with all FFAR agonists affect the colon permeability. FFAR4 agonist significantly inhibited the effect of DSS on paracellular permeability in the mouse ileum at 60, 80, 100, and 120 min after the addition of the FITC dextran probe.
Conclusions: FFAR agonists differentially affect the colon permeability in mouse colon. These differences may be explained by the activation of various intracellular pathways by FFAR agonists. As the pathways are still not completely investigated, we will examine it in the future studies. To summarize, we suggest that it is possible to develop a diet enriched with specific FFAR ligands which could ameliorate symptoms of IBD associated with disrupted transport across intestinal epithelium.
Key words: free fatty acid receptor, diet, inflammatory bowel disease.

Oral microbiome and antioxidant efficiency in schizophrenia

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Introduction: Many recent studies are focused on finding the correlation between neuropsychiatric disorders and microbiome in order to define the role of human microflora in etiopathogenesis of schizophrenia. The relationship between microflora, capacity of antioxidant systems and clinical state of patients remains unknown. Particularly worrisome is the fact, that around 40% of schizophrenia-affected patients are resistant to conventional antipsychotics.
Aim of the study: The aim of the study was to assess potential role of oral microbiome in antioxidant efficiency depending on the clinical state and effectiveness of antipsychotic treatment.
Material and methods: Oral rinse samples were obtained from 36 schizophrenic patients and 33 controls without psychiatric disorders (groups matched regarding age and sex). Clinical evaluation of patients was conducted according to the Positive and Negative Syndrome Scale (PANSS) to determine the severity of mental symptoms. Data on administered treatment derived from medical documentation. Antioxidant capacity was assessed by spectrophotometry assay based on the ability of salivary antioxidant systems to reduce iron (FRAP). Proteomic analysis using matrix-assisted laser desorption ionization time of flight mass spectrometry (MALDI-toff MS) was executed in order to obtain protein profiles of dominating bacterial species isolated from oral rinse samples. All patients gave written consent to participate in the experiment. The study was approved by the Bioethics Committee of the Jagiellonian University *Collegium Medicum*.
Results: The study revealed a relationship between protein composition of predominantly isolated microorganisms of oral microbiome (*Actinomyces*, *Streptococcus*, *Rothia*), capacity of antioxidant systems, and effectiveness of antipsychotic treatment.
Conclusions: High level of oxidative stress generated by changes in monoamine concentrations may be due to the metabolism of most commonly isolated bacterial species, which affects mitochondrial metabolism and effectiveness of antioxidant systems in schizophrenia. Multipurpose approach considering many causative agents, including redox imbalance caused by microbiome, becomes an effective tool in monitoring clinical state of schizophrenic patients.
Key words: schizophrenia, microbiome, microflora, antioxidant systems.

Forensic Medicine

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Analysis of causes of death in the group of underage in the archives of the Department of Forensic Medicine of Jagiellonian University in Cracow from years 2014-2018

Monika Kaciczak, Katarzyna Ciuk, Mirosław Kożuch, Jakub Mazur

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Introduction: The death of children is an important sociological, criminal and medical issue. The thorough analysis of forensic cases may be useful in further prevention and protection of the children.
Aim of the study: The aim of the study was to evaluate the major causes of death in group of children and adolescents.
Material and methods: We analyzed 178 cases of death in the archives of the Department of Forensic Medicine of Jagiellonian University in Cracow recorded in years 2014-2018. The only inclusion criterion was age between 24 weeks of gestation and 18 years.
Results: 104 of cases (58.43%) were male. Sex was not determinable in 2 cases (1.12%). The largest group were adolescents aged 11 to 18 (60 cases, 33.71%). The most common causes of death were as follows: due to natural cause (53 cases, 29.78%), traffic accidents (42 cases, 23.60%) and misadventures (28 cases, 15.73%). Misadventures occurred mainly at home (15 cases, 53.57% of misadventures), in 10 cases (35.71%) death occurred outside the home, in 3 cases (10.71%) there was no information about the place of death. There were 11 cases of homicide (6.18%), the vast majority of perpetrators were family members (8 cases, 72.73%). 10 deaths were caused by carbon monoxide poisoning (35.71% in group of misadventures) and it was the most common cause of deaths in this group. The other were: falls (5 cases, 17.86%), aspiration (4 cases, 14.28%), drowning (2 cases, 7.14%), being crushed by a tree (1 case, 3.57%). There were 11 cases (6.18%) of suicides.
Conclusions: The most common causes of death in pediatric population were natural causes, such as disease or congenital abnormalities. They were followed by traffic accidents and misadventures. Unfortunate accidents occur mainly at home. In cases of child abuse as homicide, family members are often the offenders. Underages commited suicide in 6.18% of cases.
Key words: children, underage, cause of death.

Hepatic necrosis as a cause of death

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Introduction: Diffuse hepatic necrosis is a sign connected with many fatal diseases – it may result from organ ischemia, chronic liver disease or poisoning. Deaths caused by liver necrosis are rare, because there are only a few substances leading to this condition – white phosphorus, amanitin and carbon tetrachloride. Also paracetamol, which is a relatively safe and commonly used drug, can lead to liver necrosis after overdose. Moreover, this complication may be developed when liver damage features appear or due to a long-term alcohol abuse at a dose three times lower than in a healthy person. Over the past few years, there have been an increasing number of deaths from hepatic necrosis, probably paracetamol poisoning in combination with alcohol.
Aim of the study: The aim of the study is to identify deaths cases caused by diffuse hepatic necrosis, determine the cause of necrosis and possibly its association with paracetamol poisoning.
Material and methods: In our research we have considered 2583 cases from years 2016-2019 in which diffuse hepatic necrosis had occurred, with central hemorrhagic necrosis predominating. We have rejected cases with stated cause of death other than liver necrosis and patients, who had died in hospital due to multiple organ failure or due to accident. We have considered cases of death in a street or in apartment with no other change than liver necrosis in internal organs which could lead to a death.
Results: In years 2016-2019 there were 7 cases of death with no unambiguous cause of death and with hepatic necrosis. Some of them were connected with alcohol or paracetamol intake. In most of examined cases patients were alcoholics or homeless. All of the cases were men, with average age of 49 y.o., and apart of liver necrosis they had hepatic steatosis.
Conclusions: Hepatic necrosis should be considered as a possible cause of death, even though it is rare. Long time gap between toxin intake to death make it difficult to prove poisoning as a cause of death in lab tests. Although, lab test should be suggested during prosecution investigation in order to exclude liver necrosis as an insulate cause of death.
Key words: liver necrosis, paracetamol, alcohol abuse, forensic toxicology.

Analysis of murder–suicides

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Introduction: A combination of murder and subsequent or simultaneous suicide is called a murder–suicide. The act can take various forms and include one or more victims. There are diverse reasons why people decide to commit such a felony. Exemplary conducive factors could be mental aberrations and excessive bond between victims.
Aim of the study: The aim of the study was to analyze frequency and characteristics of murder-suicides.
Material and methods: There were 17 cases of murder-suicides (among 1521 cases of suicide at all), associated with 23 murders in the archives of the Department of Forensic Medicine of Jagiellonian University Medical College in Cracow in years 2009-2019. Data was then analyzed in terms of method of suicide and homicide, weapon used, place of the events, age, gender, previous psychiatric treatment.

Results: Murder-suicides constitute 1.12% of all suicides. Majority of these crimes were committed by men (88%), the average age of the perpetrator was 46.94 years old with SD 16.65. Out of 17 cases 2 (12%) culprits were under the influence of alcohol and 2 (12%) had a history of psychiatric treatment. The most common method of suicide was hanging (10 cases, 60%), then inflicting injuries on oneself (4 cases, 24%), followed by self-inflicted gunshot wounds, poisoning with drugs and a car accident (1 case of each, 6%). In 12 cases (70%) a perpetrator killed one person, in 4 cases (24%) two people, in one case (6%) three additional victims. Most often a murderer and a victim were married or in a relationship (10 cases, 60%). Most common way of murder was inflicting injuries using sharp weapon (10 cases, 60%), others were: suffocation, gunshot wounds, inflicting injuries using dull weapon. Locations of murder and a suicide were the same in 12 cases (70%). In 2 cases (12%) all the victims were children.
Conclusions: Murder-suicides are a rare phenomenon. Victims who are firstly killed by the suiciders are most often family members (usually a partner). In majority of the cases place of a murder is also a spot of a subsequent suicide.
Key words: suicide, murder, forensic medicine.

Analysis of expert opinions in cases about medical errors and malpractice from the Department of Forensic Medicine of Jagiellonian University Medical College

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Introduction: Lawsuits against physicians are becoming more and more common in medical professionals' everyday life.
Aim of the study: The aim of the study was to determine what kind of medical cases are most commonly evaluated in situations with medical errors.
Material and methods: There were 122 expert opinions in cases of medical errors in the archives from 2018 and 2019. 34 (27.87%) of them were confirmed by the opinion to be medical error. There were 20 men (58.8%) and 14 women (41.2%) among the patients that were the victims. Their mean age was 47.7 ± 19.7. There were 22 civil and 12 criminal cases.
Results: We identified 13 types of medical errors. There were 16 cases (25.4%) of not performing imaging examinations, 2 (3.2%) of misinterpretation of laboratory tests, 6 (9.5%) of not examining the patient, 6 (9.5%) of not performing the laboratory tests, 7 (11.1%) of bad differential diagnosis, 4 (6.3%) of refusal of hospitalization, 12 (19%) of bad treatment, 2 (3.2%) of lack of documentation, 2 (3.2%) of lack of information for the patient, 1 (1.6%) case of instrumentation left in the patient, 1 (1.6%) of bad decision of pregnant woman transport, 3 (4.8%) of not performing endoscopic examinations, 1 (1.6%) of bad hospital organization. 22 (64.7%) of the cases resulted in death of the patient. Among most common reasons of death there were cardiac arrest (n = 5, 22.73%), gastrointestinal haemorrhage (n = 5, 22.73%), subdural hematoma (n = 3, 13.64%). The errors occurred in the following places: 15 (44.1%) times in the Emergency Room, 6 in the Surgery Department, 4 in the Gynecology and Obstetrics, 2 in the Night Medical Service, 2 in the ambulance of emergency medical team, 1 in the operating theatre, 1 in the Intensive Care, 1 in the gastroenterology outpatient clinic, 1 in the orthopedic outpatient clinic, 1 in the Neurology Department.
Conclusions: According to our study, only about 28% of the cases turn out to be confirmed medical errors. The observed medical errors were mostly the results of not following the common rules, such as not performing the imaging examinations or simply not examining of the patient. Most of them could have been avoided by following the guidelines in accordance with the latest medical knowledge.
Key words: medical errors.

Foeticide in Poland during interwar period

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Introduction: Foeticide widely known as abortion is reported since antiquity. During interwar period termination of pregnancy was legally forbidden in Poland. Hence this obstacle women were compelled to seek solutions for their unwanted pregnancy in unprofessional hazardous methods which often led to death of both mother and foetus.
Aim of the study: The aim was to analyze methods of abortion utilzed among polish women during interwar period and consequences of such actions.
Material and methods: We investigated autopsy protocols from years 1920-1939 gathered in The Department of Forensic Medicine in Cracow. We found 101 cases of illegal lethal foeticides. We excluded 7 cases of abortion due to medical indications made legally in hospital.
Results: The age of deceased women varied from 15 to 42 years. The average age was 27.91. In almost 21% of cases, the abortion was carried out by a accoucheuse. Physician was present in less than 2% of the procedures performed. In majority of protocols, the way in which pregnancy was terminated is not known. In 26.7% of remaining cases abortion was performed through usage of tools such as wire or catheter. However, in the majority of cases the used instrument remains unknown. The method for an abortion by injection/rinsing out a fetus was carried out in 8.9%. In 88% of cases there were signs of trauma in the uterus; in 9.9% it was perforated. The remnants of the amniotic sac were present in 48% of protocols, while uterine abscesus in 37%. In vast majority of cases a cause of death was fibrino-purulent peritonitis and sepsis that developed from it. The source of inflammation was located in uterus.
Conclusions: Unwanted pregnancy must have been difficult situation during interwar period. Since abortion was illegal lots of women decided to use unprofessional and hazardous methods which often led to death. In the majority of cases we could not recognise the method of abortion. Among identified were mostly mechanical or injection. The most

common consequence was an inflammation, that resulted in fibrino-purulent peritonitis and sepsis.
Key words: abortion, interwar period, sepsis, forensic medicine.

Usefulness of dissecting chest's layers in search of marks of seat belt

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Introduction: In case of fatal car accidents, it is often necessary to determine who the driver was. The Institute of Forensic Medicine in Cracow has been conducting a test for over 10 years, consisting in dissecting skin, subcutaneous tissue and muscle layers of the anterior surface of the chest, in search of seat belt marks. This method was proposed by Jacek Masełko MD.
Aim of the study: The aim of this scientific work is to analyze data and determine the usefulness of this test in clinical practice.
Material and methods: The work is based on the post-mortem autopsies of victims of fatal car accidents conducted in the Institute between 2012 and 2018. From 310 necropsies that were done, those during which the method described above was used, were selected. Based on this, an analysis was made – in how many cases the preparation of chest layers revealed marks of the seat belt, while the external examination did not show it.
Results: It was found that the preparation of the chest was carried out in 92 cases. In 31 cases, either external, internal or both, there were visible marks of the seat belt (based on specific location and arrangement), while in 63 cases the marks were not present, did not point towards seat belt or were non-specific. Out of those 31 cases, in 21 of them, both external and internal injuries were found. In 10 cases, no external traces were revealed and this preparation made it possible to determine whether the deceased was a driver or a passenger. This means that by analyzing the necropsies in which the preparation revealed marks of the safety belt, in 10 out of 31 cases the preparation made it possible to determine whether the deceased was driving the car.
Conclusions: The conclusion is, that the preparation proposed by Masełko MD is a useful method that increases the effectiveness of determining the course of an accident. It becomes helpful when it is impossible to determine whether the person was driving a vehicle based solely on external injuries.
Key words: car accidents, seat belt, autopsy, preparation of chest layers, internal injuries.

Lightning strike as the cause of death – retrospective analysis of cases from Department of Forensic Medicine in Cracow

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Introduction: Due to their rarity and spectacularity deaths caused by lightning strikes gain wide publicity. This kind of injury is also characterized by a number of typical signs on autopsy.
Aim of the study: To identify and analyze the cases of death due to lightning strike examined by Department of Forensic Medicine in Cracow in years 1994-2019.
Material and methods: Retrospective analysis of autopsy protocols from Department of Forensic Medicine in Cracow in years 1994-2019 was conducted. Only cases regarding lightning strike were chosen. The following data was gathered and analyzed: victims' demographics, month of the event, presence of branching redness "Lichtenberg figures", damage of clothes, burning of hair and skin, melting of metal objects, rock damage, electric current marks, flashover marks and alcohol in blood.
Results: 8 victims of lightning strike were identified, 3 males and 5 females. There were 5 incidents, 4 had single victim while one had four fatalities. All noted accidents took place in summer months (June-August). Flashover marks were the most prevalent finding, having been reported in 5 reports (including two from multiple-victim incident). Clothing was damaged in 5 cases, in two cases molten metal objects were described. Lichtenberg figures were present in half of the cases, the same frequency was noted for burning of hair. Traces of rock damage were found in 4 cases, all of them from aforementioned incident. Interestingly, 3 of 4 of cadavers from multiple-victim event had electric current marks that were far more typical for regular electrocution rather than lightning strike. All victims had none or negligible amount of alcohol in blood.
Conclusions: Our analysis indicates that although there are numerous specific signs of lightning strikes, none of theme is ubiquitous. Also, the lightning might induce non-specific, or even confusing damage, such as aforementioned epidermis abrasion indicative of regular electrocution. Our analysis also proved lightning strikes to be very rare cause of death (8 cases in 25 years). Our study provides insight into typical and atypical signs of lightning strikes and gives some data about their prevalence.
Key words: lightning strike, forensic medicine, electric current mark, flashover mark.

Comparison of the occurrence of pulmonary embolism amongst hospitalized patients 20 years ago, 10 years ago and recently

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Introduction: Pulmonary embolism is a severe complication of hospitalization which often leads to patient's demise. Because of that, during the last 20 years many new drugs and other prevention methods had been developed and applied in hospitals, which should have resulted in a decrease of embolic events among hospitalized patients.
Aim of the study: To assess whether new methods of prevention are effective and the number of deaths caused by pulmonary embolism has decreased.
Material and methods: We used historical data stored in the Department of Forensic Medicine UJ CM. We chose three periods of time: years 2016-2017, year 2006 and years 1996-1997. In each period we selected only these autopsies, which were performed after a death of a hospitalized patient, approximately 200 autopsies per period. Later we investigated descriptions of the selected autopsies in search for an embolic material in the pulmonary arteries.
Results: Our study has shown no significant change in the overall percentage of hospital deaths caused by a pulmonary embolism. The percentage was 1.55% (n = 3) in the years 1996-1997, 0.95% (n = 2) in the year 2006 and 0.96% (n = 2) in the years 2016-2017. However, the number of hospital deaths due to pulmonary embolism in respect of time has significantly decreased – the average occurrence was 0.2308 deaths per month (n = 3) in the years 1996-1997, 0.1667 deaths per month (n = 2) in the year 2006 and 0.0833 deaths per month (n = 2) in the years 2016-2017.
Conclusions: The number of cases which we have found is small, but if we were to draw conclusions from them, they would be as following. The results have shown that deaths caused by a pulmonary embolism occur more rarely than 10 years ago and even more rarely than 20 years ago. This change could have been caused by improvements of the prevention methods.
Key words: pulmonary embolism, prevention, forensic medicine, hospital death.

Analysis of mortal explosion injuries based on materials of the Department of Forensic Medicine in Cracow

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Introduction: Explosion injuries are rarely examined in the Department of Forensic Medicine in Cracow. They are diverse, from traces of generalized blunt trauma, through traces of fire, to the tearing of hands or face.
Aim of the study: The aim of the study was to evaluate the number, nature and injury pattern of fatal explosion incidents.
Material and methods: Analysis of the autopsy protocols covering all cases of fatal explosive injuries, collected in the Department of Forensic Medicine in Cracow from 2009 to 2019.
Results: The total number of deaths from explosions was 37. Thirty-one of the 37 victims (84%) were male, and six were female (16%). The mean age was 50.5 years. Most of the victims were civilians, one army officer died on duty. The explosion was accidental in 31 cases. Homicide by explosives was identified in 1 case and suicide in 2 cases. Circumstances were unspecified in 3 cases. The etiology of explosion was determined as gas in 22 cases, explosives in 6 cases, various kinds of stoves in 3 cases, gasoline in 3 cases, a radiator in 1 case, a pressured tire in 1 case and unclear explosion in 1 case. Twenty-seven victims were admitted alive to hospital. The average time of hospitalization until death was 11.8. The cause of death in victims receiving hospital treatment was: burns involving significant body surface 26/27 and one case of craniocerebral injuries. In the group of explosive blasts the main fatal injury was complete fragmentation of the body in 2 cases. In the remaining 4 cases fractures of the cranium (3/4) and ribs (2/4), blood in the body cavities (3/4), foreign bodies in tissues (3/4) and raptures, lacerations and contusions of the internal organs (2/4) and one traumatic amputation were described. In all cases of gas explosions (22/22) burns of significant body surface (67.5% TBSA) were main injuries.
Conclusions: The most common cause of mortal explosion injuries was gas explosion. Victims are usually middle-aged men. The results of our study indicate that fatal explosion injuries vary depending on the type of explosion. Gas explosions cause burns of significant body surface. Craniocerebral injuries, fractures, foreign bodies in tissues and tearing of the body are often described after explosive blasts. The pattern of other type of explosions was not found.
Key words: explosion injury, forensic medicine, blast, explosives.

Spontaneous human combustion – factual phenomenon or phenomenal fiction?

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Introduction: Spontaneous human combustion is a concept based on a belief that a human body can, under some circumstances, get ignited without any external factors involved. This idea, despite being supported mainly by photos of mysteriously burned human bodies, seems to be alive in culture. Not only has it a somewhat lengthy Wikipedia article, but is also referenced in some forensic medicine textbooks, which brings it to the brink of science.
Aim of the study: The aim of this study is to review and examine literature concerning spontaneous human combustion – history, impact and scientific theories regarding its possible mechanisms.
Material and methods: Literature search was performed for articles related to spontaneous human combustion in elec-

tronic databases: Medline, Embase without any restrictions. Supporting materials come from the archives of the Jagiellonian University's Department of Forensic Medicine and medical textbooks. General Google search was also conducted.
Results: Literature search had not yielded many results – after a quick screening only 7 Embase and 20 Medline articles remained. Additional 11 were retrieved from PubMed Central. The oldest articles dated back to the 1800s. While the oldest sources seem to consider spontaneous human combustion a real phenomenon, the later ones began criticizing its unscientific basis. Many articles were inspired by a prevailing theme of characteristically burned corpses (with only head and parts of limbs remaining), which were found without any apparent source of flame. Some authors tried to speculate on the possible mechanisms of self-combustion – popular theories involved the role of obesity, alcoholism and old age. There were also experiments performed on corpses to prove the phenomenon's validity. They were unsuccessful, although they proved that a human body can burn "like a candle", but only after external ignition. There were no cases which could definitely prove the spontaneous combustion theory.
Conclusions: Currently spontaneous human combustion seems to not be supported by any credible source in literature. Despite being an interesting concept, for now it should be taken away from textbooks and put among myths.
Key words: spontaneous human combustion, forensic medicine, literature review.

Analysis of suicide methods among Polish individuals Cracow 2009-2019

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Introduction: Suicide still remains one of leading cause of death in Poland. According to GUS in 2016 more people committed suicide than died in a traffic accident. Knowledge of suicide pattern and its association with different age groups is crucial to understand the problem and to improve prevention efforts.
Aim of the study: The objective of the study is to determine the frequency of different suicide methods and its association with age, gender and blood alcohol concentration.
Material and methods: There were 1521 cases of suicide in the archives of the Department of Forensic Medicine of Jagiellonian University Medical College in Cracow in years 2009-2019, which were analyzed in terms of method of suicide, age, gender and presence of alcohol. R software was used for statistical analysis.
Results: The study group had an average age of 47.21 ± 17.42 years. Majority of the suicides (83.1%) were committed by males while females accounted for 16.9%. Hanging was the most common method of suicide (76.86%). The next were suicidal high falls (7.76%), self-harm (4.5%), drowning (3.53%), self-poisoning (3.22%) and jumping under a motor vehicle (2.34%). The others suicide methods account for 2.17%. There were significant differences between the genders in choosing the method of suicide. Hanging accounts for 80.7% of suicide among males vs. 57.98% among females, $p < 0.001$. 10.12% of females as suicide method have chosen chemical substances overdose vs. 1.82% of males, $p < 0.001$. Different methods of suicide were correlated with different age groups (Kruskall-Wallis test $p = 0.001$). People who have chosen other suicide method were significantly younger than other groups (34.61 years vs. 47.49 years). In 39.18% of cases the ethanol was presented in blood.
Conclusions: Our study shows that the preferred suicide method varies between age and gender groups. Younger people were more likely to choose non-standard methods of suicide. According to statistical data the most common method of suicide in Poland is hanging (especially among males, 83%), what was confirmed in our study.
Key words: suicide, method of suicide.

Analysis of suicide committed by suffocation by the use of a plastic bag or a cable tie

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Introduction: Suicide resulting from suffocation can be committed by various methods. Methods using a plastic bag or a cable tie are still not well researched, but since they are becoming more frequently observed, need to be studied further. What is more, there are many difficulties with diagnosis in such cases.
Aim of the study: The aim of the study was to find out dissectional evidence typical for those methods of suicide, which could be helpful to pronounce an opinion.
Material and methods: Suicide resulting from suffocation can be committed by unconventional methods, such as using a plastic bag or a cable tie. These methods are still not widely researched, but, since they are becoming more frequently observed, need to be studied further. What is more, there are many difficulties with diagnosis in such cases (mainly in cases with a plastic bag). The aim of the study was to find out dissectional evidence typical for those methods of suicide, which could be helpful to pronounce an opinion.
Results: 26 cases were compatible with established criteria (23 suicides committed with plastic bag, 3 suicides committed with cable tie), ages 15-85 with a mean age of 35.7 and median of 30. The majority of subjects were male (21, 80.7%). Alcohol was found in 6 cases (23%), and in 10 toxicology proved the presence of drugs, tranquilizers or psychoactive substances (38.5%). Frequency of suicide rate committed by studied methods was increasing through the years (from 1995 to 2000 – 3 cases, from 2001 to 2006 – 2 cases, from 2007 to 2012 – 11 cases and from 2013 to 2018 – 10 cases). Necropsy in cases with a cable tie revealed the furrow on the neck, conjunctival petechiae, petechiae on face and neck and pulmonary oedema. Autopsy results in cases with a plastic bag were unspecific and revealed such changes as pulmonary oedema, petechiae on serous membranes and nondistinctive imprints of the neck. Conjunctival petechiae was present only in 30.4% of cases.

Conclusions: The studied methods of suicide are becoming more common. Suicide caused by suffocation with a cable tie can create some characteristic autopsy results, as opposed to suicide committed with use of a plastic bag, where typical signs of suffocation are unlikely to be found. Autopsy can even be negative in those cases. Alcohol or other sedatives are frequently found in organisms of people that choose those methods of suicide.
Key words: suicide, plastic bag, cable tie, petechiae.

Reconstruction of the bone fracture mechanism in an aviation accident based on post-mortem imaging

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Introduction: Traveling by air increased over past few decades. The number of aircrafts increases with small single-engine airplanes representing up to 65% of them. Those airplanes hold the highest accident rate. Identification and investigation of bodies of victims involved in airplane disasters is often very difficult due to massive damage to the body, although it may be crucial in the investigation concerning cause of disaster, especially in small single-engine airplanes crashes. In cases of challenging autopsies of aviation disaster victims post mortem computed tomography (PMCT) may be a valuable addition to the investigation.
Aim of the study: The aim of the study is to discuss how analysis of bone fractures and other injuries may contribute to the reconstruction of events during an airplane crash.
Material and methods: Two male victims of a single-engine airplane crash, who both had valid pilot license, were firstly scanned in PMCT and then examined during a conventional autopsy. Their bone fractures described in autopsy report and in PMCT scan were analyzed.
Results: Both victims had massive, multiorgan injuries. PMCT showed that both victims presented fractures of occipital condyles, cervical and lumbar spine, pelvic bones and neck of femurs (common injuries occurring, when vertical force acts on body). Furthermore, both victims had fractured facial cranium bones, clavicles, sternum and distal parts of their upper extremities (common injuries, when horizontal force acts on body). One of the victims had noticeably more injured right side of cranium which may suggest his head collided with something in cockpit or with other pilot. Also one of the victims had fractures in carpal bones, ulna and radius, suggesting he could firmly gripped the yoke at the time of accident, meaning he could be in control of plane in that moment which has its implication in forensic investigation.
Conclusions: Thanks to the analysis of bone fractures images obtained via PMCT we can imagine the possible falling path of the airplane and we can presume who was in charge of controlling aircraft at the time of the accident. Due to that, analysis of bone fractures of aviation disaster victims can be valuable in the investigation concerning the cause of accident.
Key words: aviation disaster victims, post mortem computed tomography, bone fractures.

Public Health and Nursing

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List of papers:

Evaluation of the use of dietary supplements improving memory and concentration among students of various universities in Cracow

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Tutors: mgr Jadwiga Kryczyk-Kozioł, dr Joanna Chłopicka

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Introduction: Dietary supplements are very popular in Poland. In 2018, pharmacy and non-pharmacy sales of them amounted to 5.4 billion PLN. Research reports that from year to year community becomes more aware of this issue.
Aim of the study: The aim of this study was evaluation of the use of dietary supplements improving memory and concentration among students as well as an assessment of their knowledge in this area.
Material and methods: The questionnaire consisted of 13 closed and 1 open question and was filled by 151 students from various universities (including Jagiellonian University, University of Science and Technology, University of Agriculture). Surveys were conducted from May to November 2019.
Results: The study shows that students most often (76.8%) support their memory and concentration with coffee or tea. Only 4% declared regular use of supplements, 31.2% admitted that they had used supplements in the past. 68.8% of them declared that they know the composition of the used supplement. 54.2% of respondents noticed the expected effects of the supplement. These preparations are more often used by students during the session or only occasionally. 62.9% of those surveyed were aware of the risk of side effects which may appear during using supplement. 76.2% of them declared that they were guided by the opinion of a specialist (doctor, pharmacist, dietarian) when choosing a supplement. The most common ingredients used by students were ginkgo biloba and lecithin.
Conclusions: Most of students are not interested in the topic of dietary supplements. More often they reach for the well-known for centuries products – coffee and tea. Students who use supplements improving memory and concentration usually use also other preparations e.g. vitamins. The survey shows that the majority of students using dietary supplements have knowledge in this topic and they are aware of the consequences of taking them. However, students who have never used this kind of preparations are usually not familiar with this issue. Unfortunately, some of respondents use supplements because of advertising influence or advices given by incompetent people, what can be dangerous to their health.
Key words: survey, dietary supplement, memory, concentration.

Assessment of fluid intake by a group of female footballers from small town in Małopolska Province

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Introduction: Hydration is an important aspect for physically active people. In order to maintain a proper water balance in the body, it is necessary to take care of the adequate quantity, frequency and type of fluids intake. Dehydration can have many negative health effects, like worse sports results, weakness and other.
Aim of the study: The aim of the study was the quantitative and qualitative assessment of fluid intake by the female footballers of the "Puszcza Niepołomice" club.
Material and methods: The tests were carried out twice – before the start of the season (in February 2018) and during the football season (in July 2018). During the first measurement 22 footballers were examined, in the second measurement only 15 players participated. Statistical analysis and comparison of both tests was carried out for a group of 15 women in the age of 15 to 21. The research method used in the work was a diagnostic survey. Questionnaires of physical activity (IPAQ – short version) and dietary behaviours were used. The questions in the survey were concerning the frequency and amount of selected beverages. The examined had also anthropometric tests (height, weight, waist circumference) and body composition assessment (TANITA analyzer).
Results: The median age of footballers was 17.73 (SD 1.62) years. Over half of them consumed less than recommended 2.1 litres of fluids a day. All female players consumed drinks during training, however, the supply of liquids was at a low level, because they drank a maximum of 1 litre of fluids a day. Every day and during the training, players most often consumed water (53.3%). There were statistically significant differences in the frequency of fluids consumption depends of the season, during summer water consumption increased and tea consumption decreases (p = 0.038). The Internet was the most common source of nutrition information for players (93.3%). Nearly half of the respondents (46.7%) experienced drowsiness, which can be a symptom indicating dehydration.
Conclusions: Footballers did not follow the recommendations of proper body hydration during physical exercise, therefore it is necessary to conduct education in this area.
Key words: fluid intake, nutritional behaviour, physical activity, football, youth, women.

What are the reasons for negative online opinions about family physicians' services?

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Introduction: Today, opinions reported online are a popular form of the appraisal of medical services. The rankinglekarzy.pl contains more than 300,000 opinions about physician in Poland. From one side, this type of quality assessment may be related to the distribution of unfair judgement. On the other hand, online patients' opinions may better reflect the quality of the services provided by physicians.
Aim of the study: The main aim of the study was the analysis of criteria reported by patients attending family physicians' visits in negative opinions submitted online.
Material and methods: From the set of 2056 of opinions about 100 family physicians most frequently assessed in the rankinglekarzy.pl website, the opinions with total scores below 20 points were extracted. Based on the first 100 opinions, possible reasons for the negative assessment were qualitatively identified. The set of 15 criteria was used for further classification.
Results: The classification was carried out on the set of 639 opinions. Patients indicated a lack of respect (28.17% of all opinions), incompetence (22.07%), unmannerly attitude (16.74%), and disregard (15.65%). In 15.02% of opinions with the lowest scores, it was not possible to identify a concrete reason for a negative assessment. FF with PhD title were less prone than those without to manifest the lack of respect (16% vs. 30%, chi2, $p = 0.014$), unmannerly attitude (7% vs. 18%, $p = 0.023$), and disregard (7% vs. 17%, $p = 0.038$). Physicians with more than one speciality certificate less frequently than those with one speciality showed a lack of respect ($p = 0.024$) and unmannerly attitude ($p = 0.017$). The FF from urban areas with a population of at least 200,000 were more frequently assessed as incompetent than those from urban areas < 200,000 or rural areas.
Conclusions: The key criteria associated with an overall negative assessment of FF services include problems with respectful and attentive attitude demonstrated by a physician and the perception of physician's competencies. Interestingly, the location of the FF practice but not the PhD title or the number of specialities was associated with the opinion about the professional competencies of a physician.
Key words: family medicine, patient satisfaction, online assessment, physicians' ranking.

Is the use of lifestyle influencers' websites related to health behaviours of young adult women?

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Introduction: Millions of fans follow the most popular Internet lifestyle influencers (LIs). LIs convert their popularity to rocketing incomes through the distribution of various, claimed as health- and fitness-related products, including diet supplements, "healthy" snacks, fitness gear, and sports clothes. Still, the impact of LIs' websites on health behaviours (HB) of their users has not been studied thoroughly yet.
Aim of the study: The study was focused on the assessment of the relationship between the use of LIs' websites and HB of young adult Polish women.
Material and methods: The analysis was based on the results of the survey with the online questionnaire carried out in the representative sample of 1030 Polish women 18-35 years old. The questionnaire consisted of 53 items asking about HB, health and e-health literacy, and sociodemographic features of respondents.
Results: The mean age (standard deviation (SD)) in the study group was 26.09 (4.85) years. The percentage of women living in rural areas was 40.59% ($n = 418$), in urban areas below 100,000 inhabitants 32.23% ($n = 332$) and with at least 100,000 inhabitants 27.18% ($n = 280$). Among respondents, 25.92 ($n = 267$) had University education, 39.51% ($n = 407$) secondary or post-secondary non-tertiary and 34.56% ($n = 356$) lower than secondary. Employees of private or public sector made 30.87% ($n = 318$), entrepreneurs or farmers 10.58% ($n = 109$), and students of secondary schools or University – 18.25% ($n = 188$). There were 52.52% ($n = 541$) users of LIs' websites among respondents. The use of LIs was associated (chi2 test) with higher physical activity (PA) ($p < 0.001$), higher consumption of fruits and vegetables (CF&V) ($p < 0.001$), but also with higher usage of e-cigarettes (e-C) ($p = 0.048$). There were no significant differences in smoking (SM) and alcohol consumption (AC) between users and nonusers. A higher frequency of using influencers' websites was associated with higher CF&V ($p < 0.001$) and higher PA ($p = 0.037$). Frequency of websites' usage was not associated with AC, SM and e-C usage.
Conclusions: Women using the LIs' websites show a more favourable pattern of HB. The intensity of selected HB is related to the frequency of websites' usage.
Key words: influencers, lifestyle, health behaviours, women's health.

The analysis of predictors of the opinions on smoking-related increased health insurance rates among non-smokers

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Introduction: Health coverage is uniformly available to Polish citizens without consideration of their health behaviours. However, there are opinions suggesting that health insurance rates should be increased for those who show risky health behaviours.
Aim of the study: The study was aimed at the analysis of the factors that are associated with the acceptance of increased health insurance rates for smoking persons among non-smokers.
Material and methods: The data from the survey in the representative sample of Polish society was used for the analysis. The telephone-based survey was carried in a group of 1000 respondents. Responses of the non-smokers in the moment of the survey were retrieved. The uni- and multivariate logistic regression models were developed after dichotomising the responses to the item asking about the opinion about raised rates for smokers. Variables reflecting sociodemographic and health status, prior use of health care resources, history of smoking and the use were considered as predictors.
Results: The study group included in the analysis consisted of 757 respondents; 47.3% (n = 358) of them never and 52.7% (n = 399) smoked in the past. The multivariate model showed that older respondents (OR, 95% CI: 1.01,1,001-1.03) and those with higher income (2.17, 1.27-3.70, and 2.23, 1.34-3.71 for the comparison of two higher income categories with referential category of net income < 1500 PLN) were in favour of increased insurance rates. A contrary opinion was shown by past smokers (0.51, 0.36-0.74), Internet users (0.49, 0.27-0.90), respondents admitted to hospital in preceding year (0.57, 0.36-0.91), and those with higher level of education (0.49, 0.29-0.84, and 0.50, 0.28-0.90 for comparison of persons with higher secondary or post-secondary non-tertiary and those with University degree with the group with lower levels of education).
Conclusions: The motivations behind the acceptance of increased insurance rates for people demonstrating harmful health behaviours may be counterintuitive. Not only earlier experience of tobacco smoking but also higher education level and Internet use are related to lack of the acceptance for insurance increase.
Key words: health insurance, health behaviour, smoking, non-smokers.

Health behaviours and health literacy of young adult Ukrainian and Polish women

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Introduction: The health status of populations immigrating to other countries due to educational or economic reasons is frequently unknown. The need for adaptation to a new social environment may be related to less favourable health behaviours (HB) and health status (HL) than in the country of origin.
Aim of the study: The main aim of the study was the comparison of HB and health literacy (HL) of young adult Ukrainian (UA) women studying or working in Poland with age-matched sample of Polish (PL) women.
Material and methods: UA women were recruited to the online survey through a snowball technique. The questionnaire consisted from tools for the assessment of HL and eHealth Literacy (eHL), as well as the set of items asking about HB and socio-demographic status. For comparison, age-matched PL sample was extracted from the data of the online survey performed in the representative population of 18-35 years old PL women.
Results: The mean age (standard deviation, SD) of 57 UA respondents was 20.23 (1.78) years. Most of them were singles (96.5%, n = 55), and students of Polish universities (80.7%, n = 46). Respondents undertaking odd jobs or on self-employment in Poland made 29.8% (n = 17). The PL sample consisted of 100 women of mean age of 20.25 (1.79) years of which, 95.0% were singles and 82.0% (n = 82) students. The HL and eHL scores were lower in UA than in PL sample, but only in case of the eHL, the difference was statistically significant (17.51 (7.16) vs. 28.17 (5.37), U Mann-Whitney test, p < 0.001). The percentages of respondents with limited HL in UA sample was 54.9% (n = 28) and in PL sample 48.6% (Fisher's exact test, p = 0.58). The rates of active smoking (34.6% vs. 35.0%, p = 0.55), using e-cigarettes (35.3% vs. 34.0%, p = 0.99), frequent alcohol consumption (26.9% vs. 20%, p = 0.41), and more intensive physical activity (49.0% vs. 38.0%, p = 0.22) did not differ between UA and PL women. Only 58.5% of UA respondents vs 80.5% of PL ones assessed their HS as at least good (p < 0.001).
Conclusions: Young adult UA women studying or working in Poland demonstrates a similar profile of HB and HL as PL respondents of matched age. However, their eHL and self-assessment of HS are significantly lower.
Key words: health behaviours, health literacy, ehealth literacy, Ukrainian immigrants.

Breastfeeding in public places – what do restaurants employees think?

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Introduction: Recently, the right of mothers to breastfeed their children in public places became a subject of public debate. It was triggered by a few episodes when breastfeeding mothers were not allowed to do it in restaurants.
Aim of the study: The aim of this study was the assessment of the opinions of workers of restaurants and other gastronomical facilities (GF) about breastfeeding in public places (PBF).
Material and methods: A survey based on a self-administered questionnaire was carried out among workers of GF located in Krakow. The questionnaire consisted of 20 items asking about the acceptance and other aspects of PBF. the survey was continued until 100 questionnaires were collected.
Results: The employees 31 GF filled the questionnaires. The mean age of respondents (standard deviation (SD)) was 24.81 (4.67) years and the mean duration of employment 2.88 (1.14) years. Women made 67.0% (n = 67) of the study group, and persons living in the urban areas with > 500,000 inhabitants – 69.1% (n = 67). 52.0% (n = 52) of respondents achieved higher and 20% (n = 20) – post-secondary non-tertiary education. The number of married persons was 7% (n = 7), of those living in partner relationships 18.0% (n = 18), and of singles 73.0% (n = 73). The number of respondents who believed that PBF should not be restricted was 55.6% (n = 55); 20.2% (n = 20) were not able to provide a definite of the employment was adversely related with scores expressing the acceptance of introduction of legislature allowinf for PBF (Spearman rho = 0.20, p = 0.011). Interestingly, in the opinion of only 21.2% of respondents revealed the highest acceptance of PBF in parks – mean score (SD) 3.65 (1.15) and the lowest in means of transportation – 2.48 (1.31).
Conclusions: The persons employed in restaurants and other gastronomical points present diversified attitudes to PBF. However, they do not depend on key socio-demographic variables characterising the study group.
Key words: public breastfeeding, restaurants, self-administered questionnaire.

Are people following vegetarian diets show environmental consciousness?

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Introduction: The motivations for having a vegetarian or vegan diet seem to comply with the proecological mindset. However, ecological attitudes and practices of people following diets based on plant food have not been studied extensively.
Aim of the study: The aim of this study was the assessment of factors associated with environmental behaviours among persons following vegetarian or related diets.
Material and methods: The online survey was carried out among participants of fora and Facebook groups for people following plant food-based diets or those interested in public health issues. It was performed with integrated tool consisting of the 16-item European Health Literacy (HL) Survey questionnaire, the set of items exploring ecological knowledge (EK), attitudes (EA) and practices (EP), as well as of questions focused on sociodemographic variables. Combined score reflecting ecological variables and HL were used for further analysis.
Results: There were 127 respondents in the study group, of whom 83.5% (n = 106) were women. Of the respondents, 19.7% (n = 25) followed vegan (V), 37.0% (n = 47) lacto- and/or ovovegetarian (LO), 10.2% (n = 13) macrobiotic diet and/or pescovegetarian (MI), and 18.9% (n = 24) pollo- and/or semivegetarian (PS) diet. There were also 14.2% (n = 18) participants declaring a combined diet. The age showed a weak positive correlation with EK (Spearman rho = 0.24, p = 0.006). Higher HL was associated with EA (mean score (standard deviation): 34.63 (4.66) vs. 31.78 (5.53), Mann-Whitney U test, p = 0.011) and AP (4.99 (0.70) vs. 5.57 (0.67), p = 0.004), but not with EK (3.91 (1.14) vs. 4.08 (1.01), p = 0.55). EA was also associated with the type of diet (ANOVA Kruskal-Wallis test, p = 0.031). Higher EA was seen in the V than in the PS diet group (35.24 (4.45) vs. 31.00 (5.00), post-hoc test, p = 0.043). EA was also related to the place of residence (p = 0.042). EK was associated with sex (p = 0.04) and education level (p = 0.026).
Conclusions: Among persons following vegan or vegetarian diets, higher EA and EP are demonstrated by persons with higher HL. Pro-environmental characteristics are also associated with the type of diet and key sociodemographic characteristics.
Key words: veganism, vegetarianism, health literacy, ecological attitudes, environmental awareness.

Are we able to overcome the marketing pressure of the suppliers of soda drinks with sugar tax?

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Introduction: The advertising of soda beverages (SB) is based on sophisticated strategies inciting human emotions and promising a thrilling experience. It seems that counteracting the trend of growing obesity prevalence, also related to the consumption of sweetened products, without radical measures like sugar taxes, may be ineffective.
Aim of the study: The main aim of the study was the analysis of the influence techniques used in the advertising spots (AS) of SB distributed by the two greatest international providers present on the Polish market.

Material and methods: The assessment of AS was carried out based on the Schmitt's experiential marketing framework distinguishing several types of strategic experiential modules. The spots of seven flagship products issued from 2016 were identified and extracted from YouTube brand channels. Each AS was classified according to the type of the spot's hero (SH), target audience, techniques of influence, involvement of celebrities (CEL) and influencers (IN), exploring emotions, option for joining the brand community, and the category of marketing.
Results: The analysis was based on a set of 17 AS. The most numerous groups were the shortest AS (29%) and those lasting 60-120 s (23%). Renown media person was the most popular type of SH (50%). Other types of SH were less frequently used: symbolic character created for brand occurred in 22%, real-life person in 17%, virtual hero in 6% and community in 5% of AS. The spots were commonly addressed to youth and young adults (65%), and less frequently to the whole population (23%) or children only (12%). AS triggered experiencing amusement, curiosity, surprise, freedom, understanding, identification with the group and motivation to action. The motive of community building was used in at least 53% of analysed AS. A simultaneous appearance of an IN and a CEL could be seen in 12%, of IN only in 23% and of CEL only in 18% of AS. Spots emitted as parts of a series made 35%.
Conclusions: The AS of SB are loaded with powerful techniques of influence addressed, especially to the young audience. The use of marketing strategies is highly versatile and emotionally involving for primary clients.
Key words: sweetened beverages, advertising spots, marketing, sugar tax.

The quality of life after lung transplantation – a single-center study

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Introduction: Lung transplantation (LTx) due to end-stage lung disease is a procedure that prolongs patients' life and affects the quality of life (QoL). Among medical tests assessing the efficiency of graft, QOL questionnaires should not be forgotten during follow-up visits.
Aim of the study: The aim of the study is to examine the QoL of patients after LTx.
Material and methods: The study group consists of 68 patients who underwent the lung transplantation at the Silesian Center for Heart Diseases in Zabrze. 47 patients underwent double lung transplantation (DLT), 21 – single lung transplantation (SLT). The most common diagnoses, due to patients underwent Ltx, were: cystic fibrosis (CF) – 21, chronic obstructive pulmonary disease (COPD) – 16 patients and idiopathic pulmonary fibrosis (IPF) – 12. To determine the patients' QoL, the following questionnaires were used: WHO Quality of Life-BREF (WHOQOL-BREF), GHQ-28 Questionnaire, Saint George's Hospital Questionnaire – SGRQ. The efficiency of patients was examined during spirometry and 6 Minute Walk Test – 6MWT.
Results: The WHOQOL-BREF results indicate a comparable QoL for women and men after DLT and SLT in each of the domains: somatic, psychological, social and environmental. According to symptoms domain in SGRQ, patients after DLT complain about respiratory problems similarly to those after SLT, but total score of SGRQ shows that QoL among DLT patients is slightly better than SLT patients (29.6% vs. 32.1%). Patients with CF after LTx have the least restrictions on activity and the least exacerbation of respiratory symptoms than COPD and IPF patients (22.9% vs. 38.5% vs. 41.1%). The average distance achieved in 6MWT is greater in patients after DLT – 520 m than after SLT – 471.3 m. Also spirometry results are better after DLT – the average FEV1 result – 69.5% and after SLT – 56.2%.
Conclusions: Studies assessing QoL should be an integral part of control during postoperative visits. Those tests enable assessment of full or incomplete return of a patient to a satisfying life. This may also allow the introduction of appropriate adjustments in the treatment used and the patient's return to full QOL.
Key words: lung transplantation, quality of life.

Factors affecting patient-centeredness (PC) among medical students

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Introduction: Patient-centered care (PCC) is associated with better doctor-patient relationship, resulting in a decrease in symptoms, hospitalizations and health costs. It is important to identify factors which are infulencing PC among medical students.
Aim of the study: The aim of the study was to differentiate PC among medical students, considering the year of studying, motivation, having doctor as a relative and the type of preffered specialization.
Material and methods: Students of Jagiellonian University Medical College from 3 groups – first (F, $n = 74$) and last clinical year (L, $n = 96$) and the internship year (I, $n = 108$) were retrospectively compared to measure PC using Patient-Practitioner Orientation Scale (PPOS) [consists of Sharing (PPOS-S) and Caring (PPOS-C) subscales] and answered questions regarding age, sex, having doctors in their family, motivation to taking up medical education (ME) and choice of specialization. The informed consent was given by all participants. Participation was voluntary. Authors' permissions for the use and translation of scales were obtained. The Bioethics Committee of JUMC granted formal permission for this study. Statistical analysis was prepared in R, v.3.4.2.
Results: The groups were homogenic: demographically (excluding age) and based on additional questions. Students with higher scores were more patient-centered. L and I scores was significantly higher in PPOS than F (4.25 vs. 3.78; 4.08 vs. 3.78; $p < 0.001$). Students with doctors in family (FAM+) scored lower than others in PPOS-S (4 vs. 3.78; $p = 0.001$) and PPOS (4.11 vs. 3.94; $p = 0.009$). Students who

considered non-surgical specializations (SURG–) scored higher in PPOS-S (4 vs. 3.78; $p = 0.001$), PPOS-C (4.33 vs. 4.11; $p = 0.002$) and PPOS (4.17 vs. 3.89; $p < 0.001$). F with non-financial motivation (FIN–) to taking up medical education scored higher than others in PPOS-C (4.11 vs. 3.44; $p = 0.006$).
Conclusions: During ME PC increases and other features are in decline. Presumably it is happened due to 4-years clinical communication course and personal, medical experience. FAM+ declines PC among students. SURG– had better scores. FIN– scored higher.
Key words: patient-centeredness, PPOS.

Consumption of antibiotics by pregnant women in Poland

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Introduction: Excessive use of antibiotics in non-hospital treatment in Poland is a significant problem. ECDC (European Center for Disease Prevention and Control) reports indicate that this value is 20% higher than the European average, with an upward trend in recent years. This data refer to the general population of Poland. However, for more accurate assessment of the problem, analyzes focused on confined patient populations are necessary.
Aim of the study: The aim of this study was to analyze antibiotic prescription in ambulatory care by gynecologists for pregnant women in Małopolska.
Material and methods: The analysis used data on reimbursement of antibiotics of the Malopolska Health Fund from 2013-2014. Prescriptions were ordered by gynecologists. The database contained demographic information such as age and place of residence, date of delivery (and thus trimester analysis was possible), as well as information on the type of medicine and the number of packages purchased by patients. Antibiotic consumption was expressed as the percentage of women with a prescription and a defined daily dose (DDD).
Results: The study included 67917 women, of whom 23.6% were prescribed antibiotics during pregnancy, on average 44.7 DDD per patient. In comparison with urban residents, antibiotics were significantly more often bought by rural residents: 23.5 (urban residents with up to 100,000 inhabitants), 21.9% (urban residents with more than 100,000 inhabitants) and 24.4% among rural residents ($p < 0.001$). Significantly more often antibiotics were bought by women under 18 years old – 32.1%. The consumption of antibiotics in women aged 18-24 and 35 or more was similar, at 23.8% and 22.77%, respectively. Most – 11.2% of women bought antibiotics in the third trimester of pregnancy, in second trimester – 9%, and the lowest in first trimester – 7.8%.
Conclusions: Visible differences in the amount of purchased antibiotics between urban and rural residents may result from insufficient access to doctors in the villages. Poland stands out negatively against the background of Europe in high consumption of antibiotics. A rational antibiotic policy and appropriate patient education should be used.
Key words: antibiotics use, pregnancy.

Legal aspects of euthanasia in Poland against the background of European solutions

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Introduction: Euthanasia is a topic worth considering. This is not a topic that is often discussed enough for each of us to wonder if we should have more freedom and the opportunity to decide about ourselves when our health (physical and mental) deteriorates. Everyone knows that euthanasia in Poland is prohibited and that it is punishable by imprisonment, however, do we know what our entitlement could look like by adopting legal solutions of other European countries? What legal regulations are in force in the European Union countries to which we have open access? This work is aimed at analyzing the currently applicable laws in Poland and in selected European Community countries.
Aim of the study: The aim of the work is to analyze the current legal aspects of euthanasia in Poland against the background of solutions adopted in selected European Union countries.
Material and methods: The method of qualitative research was the analysis of legal provisions. The data collection process began with a review of legal provisions on euthanasia in Poland, i.e. 150 of the Penal Code, which is a duplication of Art. 150 of the previously applicable Code (of 19 April 1969) and Art. 227 of the Penal Code of July 11, 1932. An analysis of legal provisions was also carried out in relation to selected European Union countries, i.e. the Netherlands, Germany and Belgium.
Results: The analysis of the results included a description of the review of legal regulations and views of the medical law doctrine as well as available judicial decisions regarding euthanasia in Poland and in other countries (the Netherlands, Germany and Belgium). Based on the results obtained, conclusions were drawn regarding applicable legal regulations.
Conclusions: The results of the study indicate a variety of legal solutions adopted in selected European Union countries, in relation to the solutions adopted in our country. These solutions can be subjected to various assessments, but it should be borne in mind that the issue discussed in the work is also burdened with the possibility of making a variety of assessments from a moral and ethical perspective, which is influenced by the beliefs of the worldview, including religious values.
Key words: euthanasia, medical law, The Penal Code, European Union.

The use of healthcare services and their assessment by Ukrainian migrants staying in Wielkopolskie Province, Poland

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Introduction: During the last 5 years, the number of registered immigrants staying legally in Wielkopolskie Province, Poland, tripled. Wielkopolskie is the second province in Poland as regards the number of immigrants, with the most populous group being Ukrainians (48.05%).
Aim of the study: To investigate the access, satisfaction and barriers to the healthcare system as perceived by Ukrainian migrants.
Material and methods: A face-to-face survey was conducted in the Province's Citizens' Affairs and Foreigners Department on 298 Ukrainian migrants with the use of an original questionnaire in Russian and Polish. The representatives from throughout the Ukraine were included in the survey.
Results: The obtained sample is representative, as age and sex distributions are similar to the distributions presented in the official data provided by migration services. The majority of the respondents (55%) were men. The most numerous age group were people of 21-30 years of age (48%). The majority (56%) of the respondents had been staying in Poland for 0.5-2 years, 30% for 2-5 years, and only 3% for more than 5 years. 54% of the participants said they had received information about the functioning of the Polish healthcare system. The main source of such information was the employer (52%). Only 37% of the participants chose their family doctor in Poland. 25% of the ones who visited a doctor in Poland did not understand the diagnosis. 14% of the participants said they were treated badly during a doctor's consultation. On a 5-point scale, 42% of the participants rated the system 4 points and 25% 5 points. 90% of the participants expressed the need for publishing a guide which would navigate foreigners through the Polish healthcare system.
Conclusions: The Ukrainian migrants' population in the Province lacks knowledge of the ways how to access the health care. Even though the opinion on the Polish healthcare system is positive, an in-depth analysis reveals distinct problems such as lack of proper communication or reliable information. There is a strong need for an exhaustive guide to the Polish healthcare system.
Key words: immigrants, healthcare, availability, Ukraine, questioner.

Physical activity among Polish teenagers in Małopolska

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Introduction: Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Popular physical activities can be done at any level of skills. Regular and adequate levels of physical activity reduce the risk of cardiovascular diseases: hypertension, coronary heart disease, stroke.
Aim of the study: The aim of the study is to conduct and statistically analyze a questionnaire regarding physical activity among Polish teenagers.
Material and methods: Students attending primary and junior high schools in Małopolska were enrolled into the study. A questionnaire enquiring about their physical activity was conducted and analyzed with respect to students' sex and dwelling place.
Results: The study involved 4014 students (50% females) at the age of 14.1 ± 0.7 years. Most of the students (87%) declared regular participation in PE classes (89.8% males vs. 84.1% females, $p < 0.001$ and 88.2% village dwellers vs. 85.6% town dwellers, $p = 0.017$). The most frequent reason for not exercising during PE was illness (21.5%), next lack of sport outfit (17.6%). Among boys the most frequent reasons were: lack of outfit (21.3%), illness (17.8%) and injury (9.8%). Among girls the most common were: illness (25.2%), period (19.7%) and lack of outfit (13.8%). There were statistically significant differences between sexes in all of reasons, except injury ($p < 0.001$). The vast majority of students (96.1%) admitted to engage in additional physical activity. Everyday physical activity was declared by 32.6% of boys and 26.39% of girls ($p < 0.001$). Males spend on average more time on physical activity than females, 124.31 (± 86.3) and 96.70 (± 90.2) minutes per day respectively. Cycling and inline skating were the students' favorite activities (61.5%), more frequent among girls than boys (65.7% vs. 57.3%, $p < 0.001$) and among village residents than town residents (66.6% vs. 54.7%, $p < 0.001$).
Conclusions: Boys spend more time on physical activity than girls. Males and village dwellers are more likely to exercise on PE than females and town dwellers. In case of exercises outside school, the difference between sexes and place of residence was not statistically significant.
Key words: physical activity, cardiovascular diseases prevention, teenagers, survey.

Taenia solium infection with significant neurological signs: an integrative review on neurocysticercosis

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Introduction: Cysticercosis is one of the most common parasitosis in the central nervous system (CNS), which makes this infectious condition responsible for the largest number of severe sequelae in hospitalized patients due to the progress of the pathology. The infection is caused by the larval metacestoid form of the parasite *Taenia solium*, manifested by inflammatory conditions of the neural tissues, headache, nausea, vomiting and, when it affects the region of the spine and brain, it can evolve with convulsions. Neuroparasitosis

called neurocysticercosis (NC) has epidemiology related to socio-demographic aspects ranging from lack of sanitary conditions to lack of personal, family and environmental hygiene. In this sense, it is important to describe neurological signs.
Aim of the study: Describe the clinical aspect of *Taenia solium* infection and emphasize the neurological aspects of neurocysticercosis.
Material and methods: The integrative review was carried out from a cutout of findings both from case reports, involving clinical patients, and from bibliographical research on neurocysticercosis. The databases used were: SciELO, PubMed and Journal of Neurology. The descriptors used during the research were: cysticercosis, neurocysticercosis and imaging diagnosis.
Results: The literature points out that clinical manifestations include epileptic seizures being very prevalent, intracranial hypertension, cysticerchotic meningitis, psychic disorders, apoplectic or endarterial form and spinal cord syndrome. In Brazil, NC is a condition spread throughout the country, there is not a single state of the federation free of it. The highest prevalence is of patients from rural areas. Analyzing the age of patients, we found a mean of 37.36 years. The male gender is prevalent, with no other significant findings.
Conclusions: According to the researched bibliography there are no reports of really efficient drugs, and health education is needed for effective prevention treatment. It is necessary the development of parasitic drugs being an important advance in research on neurocysticercosis. Nuclear magnetic resonance imaging is more sensitive than computed tomography in the detection of cysticercus and intraventricular cysticercus. Tomographic changes in neurocysticercosis are dependent on the larval development phase.
Key words: cysticercosis, neurocysticercosis, diagnostic imaging.

Changing attitude towards epidemic threat – analysis of COVID-19 related knowledge of Polish people depending on time-spreading of the disease

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Introduction: COVID-19 disease became the most significant public health issue of 2020. Pandemic will have tremendous impact on world economy and society. This survey analyzes how people's attitude and knowledge concerning COVID-19 had been changing at the beginning of epidemic in Europe.
Aim of the study: The aim of the study was to compare people's knowledge and attitude towards COVID19 pandemic depending on worldwide changing circumstances in time.
Material and methods: We performed an on-line questionnaire survey in 3 stages: 30.01.2020, 15-16.02.2020, the third stage started in a day of the first confirmed case in Poland – on 4-5.03.2020. The study was shared via social media. Participants, who provided their e-mail addresses in the first stage, afterwards received messages with invitation to next stages.
Results: We have collected 245, 109 and 120 responds respectively. Respondents stated variable attitude towards following the recent information about the coronavirus with pick of interest when the first case was confirmed in Poland. They followed the news about COVID-19 mainly on the information websites and social media. Respondents' knowledge about the disease was raising in every stage in their self-appraisal. When transmission is concerned, the most common answers were: kissing, staying in the same place and contact with infected individual without symptoms. Question "what is the name of the virus" was difficult for the respondents, however correct answer was stated more than five times in the next stage. Also, respondents were not aware of the name of the disease – the majority of them did not know or gave wrong answer. Respondents overestimated the number of infections and the same pattern can be observed in terms of mortality. In the first stage 26.2% responders stated that they take precautions in relation of novel coronavirus prophilaxy. The amount raised into 30.3% in the second stage and even up to 70% in the day of first polish confirmed case.
Conclusions: These findings prove that society lacks proper education concerning COVID-19. The fact that both websites and social media were the most common sources of information shows the importance of reliable sources on the Internet.
Key words: COVID-19, coronavirus, society.

Knowledge attitude and practices towards COVID-19 pandemic among Indian general population: a cross-sectional survey

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Introduction: COVID-19 disease is highly infectious and fever, dry cough, fatigue, myalgia, and dyspnea are the main clinical symptoms of the disease. There is a necessity to understand the public's awareness of COVID-19 at this critical moment to facilitate the outbreak management of COVID-19 in India. The collection of KAP information regarding outbreaks has long been useful in apprising prevention, control, and mitigation measures during such outbreaks.
Aim of the study: To evaluate knowledge levels, prevailing attitudes, and practices among the general population of India about COVID-19 pandemic and to rule out barriers concerned with practicing risk reduction behaviors.
Material and methods: A cross-sectional study was conducted Online among the general population of India during the lockdown period. Knowledge, attitude, and practice

(KAP) towards COVID-19 infection and prevention were assessed by using a self-administered questionnaire with 32 questions. The KAP assessment was carried out by assigning scores to the variables. SPSS Version 24.0 and Chi-square test was used for Statistical analysis.
Results: 1292 people had participated in the survey and the mean age was 29.43 years. Overall the 81% of the participants had good knowledge, 77% of the participants had a positive attitude and 83.5% of the participants are following good practices. 94% of the participants are confident that India can overcome COVID-19 and 97.7% of the participants wore masks when they went out.
Conclusions: Health education campaigns and awareness events targeting the general population can enhance the knowledge, attitudes of the people to the pandemic and potentiate better practices in facing the crisis.
Key words: COVID-19, pandemic, SARS-CoV-2.

The effects of physical activity on stress during COVID-19 pandemic

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Introduction: Numerous factors affect stress levels, especially during the COVID-19 pandemic. Besides the psychological effects of isolation, it has also limited physical activity which is highly important for physical and mental health. Results of cross-sectional and longitudinal studies indicate that physical activity has antidepressant and anxiolytic effects and prevents harmful consequences of stress.
Aim of the study: This study aims to find the correlations between physical activity and stress levels and to expose the most beneficial types of activity to reduce stress.
Material and methods: We have conducted randomized anonymous questionnaires among 18-54 years old 120 adults. For the stress evaluation, we used the Perceived Stress Scale (PSS) as a psychological measurement tool. For the physical activity assessment, we used the International Physical Activity Questionnaire (PAQ). PSS evaluation scores are 0-40 (0-13 considered low stress, 14-26 moderate, 27-40 high). PAQ determines physical activity level (low, moderate, high) according to the number of days and the amount of time that physical activity is carried out. The activity level expressed in MET-minutes/week was also counted. Participants with an activity score of less than 480 MET-minutes/week, were considered to have low physical activity levels (480-1500 MET-minutes per week and > 1500 MET-minutes per week, considered moderate and high, respectively). We have also considered 4 groups of physical activity (Aerobics/Cardio, Resistance/Strength, Yoga/Tai Chi, Sedentary lifestyle).
Results: Data indicated that mostly high physical activity scores (> 1500 MET-minutes per week) are associated with low stress levels (0-13) and low physical activity scores (< 480 MET-minutes/week) with high stress levels (27-40). It is also remarkable that participants with low stress levels combine different types of physical activities. People who exercised regularly were more likely to have low stress level than those who exercised only 1-2 times a week.
Conclusions: Physical activity has been shown to be associated with decreased levels of stress. Considering that besides physical activity various factors affect the stress level, prospective studies are needed for further research.
Key words: stress, physical activity, COVID-19, mental health.

Perceived stress level among all sixth years of undergraduate medical students at Jagiellonian University Medical College

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Introduction: Polish undergraduate medical students, as well as fellow colleagues from other countries, experience stress related both to their education and general existence. Main factors leading to stressful stimuli are adaptation to medical school, ethnical conflicts, exposure to death, student abuse, educational debt, personal life events, high level of competition, overwork, working with cadavers and lack of time needed for relaxation. Furthermore, medical students tend to suffer from depression more often than students of other medical professions with almost one third of medical students worldwide suffering from it.
Aim of the study: The level of stress and the factors that lead to in among medical students at Polish universities have not yet been measured. The aim of this study was to measure the perceived stress level among all medical students, from first to the sixth year, at Jagiellonian University Medical College.
Material and methods: A survey was carried out during winter exam session of 2020. We used two international questionnaires, validated to polish language, Perceived Stress Scale (PSS-10) and Perceived Medical Students Stress Scale Instrument (PMSS) to measure stress scale among all sixth years medical students. A total of 1321 undergraduate medical students took part.
Results: Medical students reported higher levels of perceived stress than other students at the same age. The mean PMSS score was 36.64 (SD = 8.72), and it varied from 13 to 65. The PSS-10 score was indicating high stress levels among 88.42% of all medical students. Female students were statistically significance more stressed than male students. Furthermore the most stressful years were the second and the sixth. The theoretical relevance was statistically significant and positive, meaning that the higher the PSS-10 score, the higher PMSS score.
Conclusions: Perceived stress among all medical students generally is high. In comparison to German and Norwegian students Polish students are more stressed. Characterizing the level of stress perceived by medical students and finding the factors that induce it is very important. In the longer term, this may help us to decrease the stressful factors presented in undergraduate medical studies.
Key words: stress, medical students, anxiety.

Introducing dietary modifications by pregnant women

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Introduction: Introducing proper dietary modifications by pregnant women can have an impact on the right fetal development. However, women may not be aware of recommended changes to be implemented. The study aims at revealing the most common dietary mistakes made by pregnant women.
Aim of the study: The aim of the study was to check women awareness concerning the need to adapt their diet due to pregnancy.
Material and methods: The study was conducted as an anonymous questionnaire at the Gynecology and Obstetrics Clinical Hospital in Poznań among 426 women staying in the maternity department. The form consisted of 35 questions. It included questions about giving up products not recommended during pregnancy, as well as extending the diet with products that have a positive effect on fetal development. The respondents were asked if their gynecologist raised the issue of the necessary diet modifications related to pregnancy. Patients also answered the question about the frequency of eating snacks and their type.
Results: 97% of respondents ate no raw eggs during pregnancy, 96% ate no raw meat nor fish, 75% of women avoided blue cheese. 75% of respondents ate one or fewer portions of fish per week, and 70% of respondents ate at least 3 portions of dairy products per day. 62% of respondents were informed by doctors about the necessity to modify their diet due to pregnancy. 71% of patients consumed snacks every other day or more during pregnancy – fruit (80%) and sweets (53%) were the most popular. Our study revealed significant correlation between type of snack and frequency of its consumption – snacks considered healthy (nuts, fruit, vegetables) were eaten less often, while unhealthy snacks (sweets) were eaten more frequently.
Conclusions: The awareness of pregnant women regarding the necessity to avoid raw products, such as eggs, meat and fish, is high. In case of blue cheese, the awareness is lower, which may result from the lack of information about the risk of listeriosis. Most of the respondents eat fish less than recommended. A large sweets' consumption deserves attention, which should definitely be limited.
Key words: pregnancy, diet, newborn health, feeding behavior.

Knowledge of pregnant women about the impact of used drugs on pregnancy

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Introduction: In the era of widespread availability of drugs and dietary supplements, there is a risk of unnecessary use of products not recommended for pregnant women. At the same time, properly conducted supplementation of micronutrients and vitamins may positively influence the fetal development. The study is meant to present the most common mistakes made by women using pharmaceuticals during pregnancy.
Aim of the study: The aim of the study was to evaluate the prevalence of medications and dietary supplements use by pregnant women.
Material and methods: The research was conducted as an anonymous questionnaire at the Gynecology and Obstetrics Clinical Hospital in Poznań among 426 women staying in the maternity department. The survey consisted of 43 questions. It tackled the issue of using medicines and dietary supplements, as well as adapting the therapy of chronic diseases due to pregnancy.
Results: Among women participating in the survey, 35% were ill chronically and 29% used medications permanently. 47% of respondents used other medicines during pregnancy that were not related to the primary disease. 96% of women supplemented folic acid during pregnancy, 81% – iron, 78% – vitamin D, 62% – iodine. 61% of patients also applied folic acid before pregnancy. Our study revealed significant correlation between planning to become pregnant and supplementation of folic acid – women who didn't plan their pregnancy mostly were not taking folic acid. There is also significant negative correlation between applying folic acid and occurrence of birth defects. The main source of knowledge about the need to take individual dietary supplements during pregnancy is a gynecologist (around 78%). Rate of women found to be deficient in certain substances was respectively: 33% for iron and 10% for vitamin D.
Conclusions: A significant percentage of pregnant women use drugs related to chronic diseases during pregnancy, therefore there is a need for careful monitoring of the medicinal products used by patients. The meaning of supplementation has a widespread recognition but the awareness of the need to use folic acid before pregnancy is not too high, therefore its supplementation throughout the entire reproductive period is crucial.
Key words: pregnancy, drugs, folic acid.

What do Polish students know about coronary artery disease? – survey study

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Introduction: Coronary artery disease (CAD) is one of the most common cause of death in Poland. Nevertheless, the level of knowledge about this pathology, risk factors and complication seems to be insufficient in our society.
Aim of the study: The aim of our study was to investigate the level of knowledge about CAD among Polish students.
Material and methods: We conducted a survey study by internet questionnaire. Interviewees were 173 students of Polish universities. The questionnaire was prepared in accordance to second version of Coronary Artery Disease Education Questionnaire (CADE-Q II). There were 31 questions that assess students' literacy, in each four options to choose: right answer (for 2 points), half-right answer

(1 point), wrong and "I don't know" answer – both marked as 0 points. The maximum overall score of the test was 62 points.

Results: We collected answers from 173 participants. Among them, there were 60 men (34.7%). The mean age of contributors was 22.0 (21.0-22.0) and the mean overall result of the survey was 48.0 (44.0-52.0). In the questionnaire, 118 particpants declared the contact with cardiovascular diseases (CVD) that was defined as their own illness or their family members or friends being affected. Suprisingly, in direct comparison of both groups – the students who had contact with CVD and who not had, there were no significant differences in terms of gender, age, the place of residence and the sum of the survey. The trend to higher self-assessment of knowladge was observed in contributors who had contact with CVD ($p = 0.06$). By multivariable analysis, the younger age ($\beta = -0.87$, $p = 0.001$) and higher self-assesment of knowladge ($\beta = 2.58$, $p \leq 0.001$) was independently associated with higher overall survey score.

Conclusions: The knowledge about CAD in polish students may be considered as insufficient, Unfortunately, the personal contact with CVD did not correlate with higher CAD literacy. Further CAD awareness campaigns are necessary to gain adequate knowledge about CAD in Polish students.

Key words: coronary artery disease, survey study.

Basic Sciences, Genetics and Molecular Biology

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Beneficial effect of intestinal alkaline phosphatase (iAP) in obese mice with forced exercise and experimental colitis

Szczepan Świerz, Aleksandra Danielak, Dominika Pawełczak, Tomasz Renkas, Radosław Dziedzic

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Introduction: Inflammatory bowel diseases (IBD) are characterized by chronic inflammation of digestive tract and comprise Crohn's disease and ulcerative colitis. Regular physical activity seems to be beneficial in IBD and is recommended in obesity-related disorders. iAP is an endogenous enzyme synthesized by intestinal epithelial cells and its activity has been linked with the protection of the gut. Administration of iAP may emerge as a possible treatment of a whole spectrum of gut-related disorders.

Aim of the study: The aim of this study was to assess the efficacy of exogenous iAP administration combined with forced exercise in diminishing the inflammation and structural intestinal damage in mice with 2,4,6-trinitrobenzenesulfonic (TNBS) acid induced experimental colitis.

Material and methods: In this study 53 male C57BL/6 mice were divided into 2 categories: Lean (L) fed normal diet and Diet induced obesity (DIO) fed high fat diet. Animals were subjected to forced treadmill exercise for 6 weeks. Subsequently, for 14 days animals received iAP in drinking water and then TNBS was administered intrarectally. After 5 days body weight (BW) and skeletal muscle strength (grip test) were measured. At the end of the experiment blood and colonic tissue samples were obtained. Disease activity index (DAI) was determined by macroscopic inspection of the samples and confirmed histopathologically.

Results: Groups receiving iAP+TNBS varied from groups receiving only TNBS. For DIO mice, DAI score was higher in TNBS group and for L mice no differences in DAI score between iAP+TNBS and TNBS groups were observed. Grip test score for DIO mice was higher in iAP+TNBS group, and L mice didn't differ. BW also varied between groups – in L mice iAP provided higher BW and in obese mice the BW was reduced.

Conclusions: iAP can be considered as a promising option in the treatment of experimental colitis. The mechanism of therapeutic activity of iAP in DIO mice may involve BW reduction and improvement of muscle strength impaired by colitis.

Key words: intestinal alkaline phosphatase, inflammatory bowel disease, forced physical exercise, body weight reduction.

Changes in cell shape and actin cytoskeletal networks during exit from naïve pluripotency

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Introduction: All cells come from a single fertilized egg. Early embryonic stem cells are pluripotent, which means that they can make any of the germ layers and the germ line, but later on during development they start undergoing fate transitions to differentiate into different tissues. These fate transitions are usually accompanied by changes in cell shape. Cell shape is controlled by the organisation and mechanics of the actin cytoskeleton. There is increasing evidence suggesting feedbacks between cell shape, mechanics and fate, but the underlying mechanisms are not well understood. In this study we investigated changes in actin cytoskeletal networks during a fate transition using mouse embryonic stem (mES) cells as a model system. Indeed, naïve mES cells display rounded morphologies and aggregate in three-dimensional (3D) colonies, but undergo a characteristic cell spreading as they exit naïve pluripotency. Thus, they constitute a good model system to investigate the coupling between cell shape and fate.

Aim of the study: To illuminate how actin organization changes as mES cells undergo shape and fate transitions.

Material and methods: Firstly, we characterised cell shape changes during exit from naïve pluripotency in mES cells using scanning electron microscopy (SEM). Then we investigated changes in actin cytoskeleton using G-actin/F-actin in vivo assay kit (Cytoskeleton® Inc.) We then explored changes in levels of selected actin-binding proteins potentially regulating actin polymerisation and cell shape, using western blotting and immunostaining.

Results: A key finding of our study is the observation that the G/F actin ratio decreases during exit from naïve pluripotency.

Conclusions: We hypothesize that G/F-actin ratio changes may be a common feature of shape changes, with spreading being associated with increased actin polymerization.

Key words: actin, cell shape, embryonic stem cells, pluripotency.

Comparative analysis of skin wound healing process between reparative (scar-forming) Balb/c/cmdb mice and regenerative (scarless) CBy.Cg-Foxn1/cmdb nude mice models

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Introduction: The wounded skin of adult mammals is incapable of regeneration. The post-injured tissue heals through the process completed with the scar. There are limited data aiming to explain scarless skin healing ability of a few exam-

ples among mammals: skin of mammalian fetuses, Foxn1-deficient (nude), and Acomys mice.
Aim of the study: Comparative analysis of skin wound healing process between scar-forming and scarless mice model.
Material and methods: To explore the cutaneous healing process of nude mice we applied mature nude CBy.Cg-Foxn1/cmdb and genetically matched controls (Balb/c/cmdb). The excisional skin wounds were created on the back of mice and the healing process was analyzed in collected samples at days 1, 2, 3, 5, 7, 14, 21 and 36 after injury. To analyze the re-epithelialization process in the second experiment post-injured mice were given BrdU injection 2 hours before sacrifice of animals.
Results: The differences in skin wound healing between nude and BALB/c mice were observed in each stage of the process: inflammation, new tissue formation and tissue remodeling. Flow cytometry analysis of BrdU-labelled cell isolates, immunohistochemical detection of keratin 16 and macroscopic wounded skin estimation revealed faster process of re-epithelialization and most robust keratinocytes proliferation for nude than for Balb/c mice particularly at day 2 and 3 after wounding. Inflammatory response analyzed as MCP-1 protein levels and the percent of macrophages (CD68 positive cells) was more vigorous in post-wounded skin at day 3 and 5 of nude mice than BALB/c. The remodeling stage in nude mice characterized by typical for regenerative healing bimodal pattern of Mmp-9 expression detected in the first and the last stage of healing process. Moreover, skin healing of nude mice showed high levels of Tgf-ß3 (anti scaring properties) and low levels of Tgf-ß1 (pro scaring) expression compared with Balb/c mice.
Conclusions: Overall, the data show substantial differences in skin wound healing process between nude and Balb/c mice indicating scarless (regenerative) pattern of healing in nude mice.
Key words: wound healing, skin, regeneration, scar, Foxn1, nude mice.

ECT combined with PDT in melanoma treatment

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Introduction: Curcumin is widely known for its high potency as an anticancer drug [1]. Due to its hydrophobic properties, it seems to be especially effective towards cutaneous and subcutaneous tumors. Nowadays more and more effort is being devoted to enhance cytostatic properties of the drug with the use of novel therapies, such as photodynamic therapy (PDT) and electrochemotherapy (ECT). Both of them show promising effects when applied alone, but recent data suggest, that their combination can be beneficial [2].
Aim of the study: In this project, the authors propose a protocol for effective combination of PDT and ECT, validated by a set of experiments.
Material and methods: The experiments have been performed on melanotic (A375) and amelanotic (C32) cell lines, while fibroblasts have been used as a model of non-cancerous cells. To study the PDT and ECT protocols, we analysed the effects of irradiation and of high electric fields on curcumin using mass spectrometry methods. Immunofluorescence staining studies as well as viability tests were performed on all cell lines. The interaction of curcumin and its derivatives with model cell membranes, namely lipid bilayers, was studied using molecular dynamics simulations.
Results: Our analyses show that during PDT, curcumin undergoes decomposition to more potent and smaller compounds, such as vanillin and ferulic acid. In ECT on the other hand, curcumin loses sequentially its methoxy groups. Due to its rather hydrophobic nature, curcumin first partitions within the lipid membranes (cells envelop). With time, it changes its localization to intracellular membranes. Overall concerning the effectiveness of using curcumin as anticancer agent, the preincubation with curcumin has led to much worse results. Two hypotheses can explain the obtained results: (1) either irradiation of the photosensitizer disrupts the membranes in which it localizes, leading to extensive damage; (2) or inside the cells, curcumin metabolism being rapidly metabolized, the effectiveness of PDT is drastically reduced.
Conclusions: At any rate, the data we have gathered show that the most effective way of combining both therapies is to electroporate simultaneously after addition of the drug and irradiate afterwards. Further studies are now required in order to test whether these in vitro protocols to effective successful cancer therapy.
Key words: melanoma, PDT, ECT, cancer-therapies.

Endothelial function depending on the visceral fat level in healthy young students

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Introduction: It is known that visceral fat has been linked to metabolic disturbances and increased risk for cardiovascular disease. Obesity is one of today's most blatantly visible public health problems. There is major concern that medical progress in reducing coronary heart disease, high cholesterol and hypertension could be reversed by the escalating global epidemic of overweight and obesity – 'globesity'. Obesity is a risk factor for hypertension, congestive heart failure, stroke, renal dysfunction, gallbladder disease, cancer, osteoarthritis, and impaired quality of life. The haemodynamic profile of obese hypertensive subjects is characterized by high intravascular volume, high cardiac output and increased peripheral vascular resistance.
Aim of the study: To find the relationship between endothelial function and the level of visceral fat in the body of young students.
Material and methods: The subject of the study were 33 young men age from 18 to 25. The weight, BMI and the indices of body composition: percentage of body fat (BF, %), percentage of fat-free mass (FFM, %), visceral fat (VF) were measured by body-analizer Tanita BC-601 (Japan).

A non-invasive method was used to test the functional state of endothelium by causing endothelium-dependent vasodilatation (device 'REOKOM', Ukraine). Also, we measured the indexes of cardiac function by using thoracic rheography. We measured cardiac output (CO l/min), systemic vascular resistance (SVR, dynes/sec/cm^{-5}). The data was analyzed by using the correlation method with statistical program STATISTICA 10.

Results: The results show that there was the statistical significant correlation between the index of vasodilatation and cardiac output (r = 0.3916, p < 0.027). We found the statistical significant relationship between the level of VF and index of system vascular resistance (r = –0.4320, p < 0.014). Also we found negative statistical significant relationship between the index of vasodilatation and the systemic vascular resistance (r = –0.3629, p < 0.041).

Conclusions: Our data indicate that the increase in the level of visceral fat leads to a decrease of systemic vascular resistance. Such continuous vasodilatation further could lead to endothelial dysfunction. Due to the negative influence of adipokines of the visceral fat, endothelial cells will lose the ability to the synthesis of nitric oxide. We suppose that increased visceral fat leads to endothelial dysfunction. Therefore, it could be the risk factor for appearing cardiovascular diseases in the future.

Key words: endothelial function, adipose tissue, fat free mass.

Functional conditions of autonomic nervous system in young people with sleep disturbances

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Introduction: Humans are the only mammals that delay their sleep. Sleep deprivation or disturbances is a silent killer. In recent times, the quantity and quality of sleep has decreased manifold. Chronic sleep deprivation or other sleep disturbances have an adverse affect on the entire physiology and psychology of an individual, irrespective of any age or gender.

Aim of the study: To find the statistical differences between the indices of the functional conditions of the autonomic nervous system in students with and without sleep disturbances.

Material and methods: The subject of the study was students of the 2nd course of Medical Faculty No. 2 with age from 18-23. We divided students in two groups: Group 1 included 6 students with sleep disturbances and Group 2 included 6 students without sleep disturbances. We used Pittsburg's Quality Sleep Index (PQSI) to assess of sleep quality. The functional condition of the autonomic nervous system (ANS) was measured by a device called 'Cardiolab'. To assess the functional conditions of ANS, we used indices of low frequency (LF, %), high frequence (HF, %) and very low frequency (VLF, %) and the parameter of the regulatory system activity (PARS, un/). The data was analysed by t-t independent by variables method, STATISTICA 10.

Results: This analysis found evidence for significant differences between index of VLF in students with sleep disturbances (M = 41.5 + 12.17) and without sleep disturbance (M = 19.23 + 4.43) (p < 0.001). We found the significant difference among two groups in Index of HF (p < 0.004). There was not found significant difference between two groups among LF and PARS (p > 0.05).

Conclusions: From the above experimental study, we can briefly conclude that students who have sleep disturbances likely to had higher score according to the Pittsburg's quality of sleep index in comparison with students who had not have any sleep disturbances. Moreover students with sleep problems have higher activity of high center of the nervous system and low activity of parasympathetic divisions of autonomic nervous system.

Key words: sleep quality, autonomic nervous system.

Intercorrelations among metabolic age, vital capacity and body composition among young students with and without smoking habits

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Introduction: An estimated one billion men and 250 million women worldwide are daily tobacco smokers, primarily through cigarettes. Cigarette smoking is the cause of about 90 percent of the world's lung cancer cases. Smoking produces a chronic inflammatory state, causes endothelial dysfunction, enhances thrombogenesis, can cause insulin resistance and diabetes, and is associated with an atherogenic lipid profile.

Aim of the study: To find the correlation within the body composition and the metabolic age and the difference between vital capacity of lungs among smokers and non-smokers students.

Material and methods: The subject of the study was 16 students of the age group 18 to 23. We divided them in two groups: 8 men, who have been smoking for more than one year (group 1) and 8 non-smoking men (group 2). The weight, BMI and the indices of body composition: percentage of body fat (BF, %), percentage of fat-free mass (FFM, %), visceral fat (VF), metabolic age, percentage of fat in the trunk and muscle in the trunk were measured by body-analizator Tanita BC-601(Japan). The functional condition of Lungs (Vital Lung Capacity, VLC) we measured by a regular spirometer (device 'SPIROKOM'). The data was analysed by statistical program STATISTICA 10, by using correlation and t-test for independent variables methods.

Results: Firstly, we found statistically significant difference between values of VLC among the group of non-smokers (VLC = 5.84 ± 0.94, l) and the group of smokers (VLC = 3.91 ± 1.66, l) (p < 0.012). Secondly, our results demonstrated that the metabolic age has significant positive correlation with the level of VF (p < 0.001) and the index of BMI (p < 0.002) in both the smokers and non-smokers conjointly.

Conclusions: Our study suggested that smoking for a long time has higher risk of having reduced VLC thereby by causing a disruption in the respiratory function. Also we could predict, that people with smoking habit and increase level of VF are likely to have elevated metabolic age of their body.

Key words: metabolic age, vital capacity.

The relationship between the level of adipose tissue in the body with function of the heart in young students

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Introduction: Obesity is becoming a global epidemic in both children and adults for cardiovascular disease which includes coronary artery disease and heart failure. Increased visceral adipose tissue is recognised as an emerging risk factor that predicts cardiovascular disease. Increase in cardiac mass, ventricular dimensions, and stroke volume are typically observed in obese adults, accompanied by evidence of diminished ventricular systolic and diastolic function. Age, sex and genetics play a vital role in development of adiposity and thus affect cardiovascular function of the subject from different ethnic background.
Aim of the study: To find the connection between indices of function of heart with the percentage of adipose tissue in a body.
Material and methods: The subject of this study were 57 young men with age from 18 to 23. The weight, BMI and percentage of body fat (% BF) and the level of visceral fat (VF) were measured by body-analizator Tanita BC-601. The cardiac output (CO), stroke volume (SV), index of workload of left ventricle (WLV) and the index of power of contraction of LV were measured by using medical device 'REOKOM'. The data was analysed by using statistical program STATISTICA 10, correlation method.
Results: We find the significant positive correlation between the % BF and CO ($r = 0.3899$, $p < 0.003$) and % BF with index of WLLV ($r = 0.397$, $p < 0.002$). Also we observed the connection between the level of VF and the index of power of contraction of LV ($r = 0.291$, $p < 0.028$).
Conclusions: From our study we could conclude that increase % of BF and the level of vVF in the human's body have negative effect on function of heart. Moreover, belly fat is high associated not only with heart diseases, but also with metabolic disturbance, which could to the deterioration of the cardiovascular diseases.
Key words: body fat, cardiovascular disease.

Hypotensive drugs modulate contact sensitivity reaction in actively-sensitized mice fed with high-salt diet

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Introduction: Nowadays, altered reactivity of immune cells is believed to be involved in the pathogenesis of hypertension. However, little is known about possible immune modulatory effects of clinically relevant hypotensive drugs, especially in individuals at risk of hypertension, e.g. due to high-salt-intake.
Aim of the study: Previously, we have shown that some of hypotensive agents modulate contact sensitivity (CS) reaction in healthy mice. Thus, our current studies aimed to investigate the effect of hypotensive drugs on active CS induced by trinitrophenyl (TNP) hapten in mice fed with high-salt diet.
Material and methods: Control mice were constantly fed with standard chow, while animals of experimental groups, since weaning, were for 2 months kept on high-salt diet (containing 10× more NaCl). Then, mice were treated with one of the following drugs: propranolol (10 mg/kg), carvedilol, captopril, verapamil (5 mg/kg), amlodipine (3 mg/kg) or olmesartan (1 mg/kg) for 8 days. On the third day of drug administration, mice were sensitized with TNP by application of 0.15 ml of 5% TNP-chloride solution on shaved abdominal skin. Five days later mice were challenged by application of 0.01 ml of 0.4% TNP-chloride solution on both sides of both ears to elicit CS ear swelling, measured 24 hours later with engineer's micrometer.
Results: Type of diet failed to impact CS reaction, while treatment of mice with amlodipine, captopril or carvedilol significantly suppressed CS response in mice fed with high-salt diet.
Conclusions: Our results demonstrate that hypotensive drugs modulate allergic cellular immune response. This effect may result from polarization of immunity towards Th2-type under the influence of tested medications. These observations suggest that some of the tested drugs achieve their hypotensive effect also due to their immune modulatory activity.
Key words: high-salt diet, hypertension, hypotensive drugs, immune response modulation.

Carotenoids induce changes in the profile of gene expression determining lipid metabolism and cell survival in the LNCaP line of human prostate cancer

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Introduction: Prostate cancer (PC) is the second most common cause of cancer-related deaths among men. The rational design of chemotherapeutic agents which will be effective against PC requires an understanding of metabolism and increased tumor cell survival. Carotenoids are compounds presenting the capability of modulating the above processes.
Aim of the study: The aim of this work is to determine the impact of carotenoids on the expression of genes associated with: lipid metabolism, drug transport at the cellular level and control of cell survival.
Material and methods: The cells of the human prostate cancer LNCaP line were treated with: 5 μM β-carotene (BC), 5 μM lycopene (LC), 5 μM completely trans-retinoic acid, 5 μM 9-cis-retinoic acid and 5 μM fenretinide. 0.03% ethanol or liposomes (for BC and LC) were used as control. The posi-

tive control was 5 µM arachidonic acid (AA). After 24 hours incubation at 37°C in 5% CO_2 cells treated or not treated with reagents were harvested and mRNA was isolated using the RNasy Mini Kit (QIAGEN) according to the manufacturer's protocol. cDNA was synthesized on the template of isolated mRNA using reverse transcriptase and then amplified with PCR. PCR products underwent electrophoresis in agarose gel and were visualized with ethidium bromide. Microarrays analysis with hybridization of fragment biotin-labeled cRNA molecules and double phycoerythrin staining was used for expression analysis. The detection of the fluorescent signal was performed by the GeneChiR Scanner 3000 System.
Results: Carotenoids significantly influence the transcription of mRNA for ABC transporters (ABCG1, ABCG2, ABCC4). In addition, they modulate the expression of numerous genes responsible for cholesterol metabolism (SREBP1/2 and ABCA1 pathway) and conditioning cell survival (apoptosis, proteasome, reactive oxygen species and heat shock protein).
Conclusions: Carotenoids affect critical issues in the scope of oncological therapy: energy metabolism and mechanisms controlling the survival of cancer cells. An important issue that should be investigated is the interaction of carotenoids with the current chemotherapeutic agents used to treat PC.
Key words: prostate cancer, carotenoids, ABC transporters, lipid metabolism.

Age peculiarities of ultrastructural alterations of the convoluted seminiferous tubules in the early stages of experimental type 1 diabetes mellitus

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Introduction: Diabetes mellitus (DM) is a major medical and social health problem all over the world due to the significant incidence rate and its serious complications.
Aim of the study: to investigate the ultrastructural alterations of the convoluted seminiferous tubules in two-month-old rats with streptozotocin-induced DM (SIDM).
Material and methods: The study included 10 two-month-old Wistar rats (body weight 75-80 g), which were divided into 2 groups: control (5 animals) and experimental (5 animals with SIDM). SIDM was simulated by a single intraperitoneal administration of streptozotocin "SIGMA" (USA), which was diluted in 0.1 M citrate buffer with pH 4.5 (calculated at 6 mg per 100 g body weight). The control group received intraperitoneally a single dose of 0.1 M citrate buffer with pH 4.5. The scanning and transmission electron microscopy, biochemical and statistical methods of investigation were used.
Results: On the 28th day of SIDM, glucose and HbA_{1c} levels in the blood of experimental rats increased 3.5 and 3.7 times, respectively, indicating the development of decompensated SIDM. In the microhaemovessels of the rats' testes, the RBC sludges, adhesion of platelets and red blood cells are noted. A significant increase in the capillary wall area by 25.3% ($p < 0.05$), as well as oedema and desquamation of the endothelium are noticed. The basement membrane is irregularly thickened. In the parenchyma of the testes, there is a thickening of the basement membrane of the convoluted seminiferous tubules and displacement of the layers of the spermatogenic epithelium toward their lumen. The height of the spermatogenic epithelium, compared with the control, is likely to decrease by 21.6% due to a decrease in spermatogonia by 16.2%, spermatocytes – by 27.2%, spermatids – by 11.9% (in all cases $p < 0.05$). In some spermatogonia, spermatocytes and spermatids, there is a vacuolar dystrophy, which is manifested by: clearing of the mitochondrial matrix and disorganization of their cristae; the presence of small vacuoles in the cytoplasm. Sertoli cells undergo the most pronounced changes, as in their cytoplasm appear numerous vacuoles of different sizes, lipid droplets and lysosomes. At the same time, the contacts between the supporting cells are not broken.
Conclusions: On the 28th day of the course of SIDM, the hypotrophy of the spermatogenic epithelium on the background of the initial signs of diabetic microangiopathy is observed in the testicles.
Key words: convoluted seminiferous tubules, Sertoli cells, diabetes mellitus, streptozotocin DM.

VISTA expression analysis on natural killers cells in children with severe and recurrent infections with herpes simplex virus

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Introduction: Recurrent and severe herpes simplex virus (HSV) infections remain a problem for clinical immunologist. Patients with chronic viral infections, such as with hepatitis B virus, were described to have upregulated expression of checkpoint molecules, i.e. programmed cell death protein 1 (PD-1), leading to uncontrolled reproduction of the virus. Nonetheless, the role of checkpoint molecules in pathomechanism of herpesviral infections is poorly understood. Here, we investigate the expression of recently discovered checkpoint molecule VISTA (V-domain Ig-containing Suppressor of T cell Activation) in prolonged and recurrent HSV infection on NK cells and their subsets.
Aim of the study: The aim of the study was to compare VISTA expression on NK cells and their subsets in patients with severe and/or recurrent HSV infections in comparison to healthy controls.
Material and methods: Study was performed in children suffering from severe and/or recurrent HSV infections and age-matched healthy controls. VISTA expression was analyzed on peripheral blood NK cells using multicolor flow cytometry.
Results: The percentage of cells expressing VISTA molecule was lower in case of CD16brightCD56dim NK cells and higher in case of CD16dimCD56bright subset in patients than in controls subjects.
Conclusions: Here, we present, for the first time, VISTA expression pattern on NK cell subsets. Differences in VISTA expression on these two subpopulations between patients with

severe and/or reccurent HSV infections and healthy children might be associated with the course of infection, yet futher studies are required.
Key words: NK cells, VISTA, cytofluorometry.

TRIM21 gene expression analysis in patients with severe and/or recurrent Herpes virus infections or autoimmune diseases

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Introduction: TRIM21 (known also as Ro52) is a protein rated to the family of tripartite motif proteins. It is an intracellular polypeptide, which may bind Fc part of IgG and has activity of ubiquitin ligase. It is reported that TRIM21 is involved in neutralization process, which is aimed at viruses destruction. One of the problems that modern medicine still faces is severe, recurrent and atypical Herpes simplex virus (HSV) infections. The molecular causes of this disorder are still unexplained. On the other hand, Ro52 protein may also be involved in the autoimmunity mechanism, where its excessive expression causes autoantibody formation. The protein can be important in both chronic viral infections and autoimmune diseases, where it also plays a significant role.
Aim of the study: The aim of the study was to determine the expression of TRIM21 mRNA in children with severe and/or recurrent HSV infections or autoimmune diseases, in comparison to age-matched control subjects.
Material and methods: The blood samples were obtained from patients with severe Herpes virus infections, autoimmune diseases and healthy donors. Peripheral blood mononuclear cells were isolated in density gradient, from which RNA was isolated and then subjected to reverse-transcription polymerase chain reaction (RT-PCR). Finally, the amount of gene transcript for TRIM21, and a housekeeping gene, was determined by using real-time PCR method.
Results: In Patients with chronic HSV infections, expression was lower than in the control sample. In contrast, in the group of patients with autoimmune diseases, Ro52 expression was much higher, in comparison to control subjects.
Conclusions: Ongoing chronic/recurrent Herpes viral infection, which cannot be fought by immune system, may be reflected in the reduced expression of the TRIM21 gene. On the other hand, upregulated expression of TRIM21 gene might promote autoimmune processes, in which the formation of anti-Ro52 antibodies is also observed.
Key words: TRIM21, autoimmune diseases, RT-PCR, viral infections.

Effect of combination of 5-fluorouracil and cyclophosphamide on the proliferation of human colorectal cancer cell line HT-29 and COLO320

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Introduction: Colorectal cancer (CRC) remains one of the most commonly diagnosed malignancies worldwide and a leading cause of cancer-related death. CRC typically develops very slowly on the inner layer of the colon as a benign, non-cancerous polyp. Modern treatment of colorectal cancer predominantly depends on surgery and chemotherapy (including targeted therapy). Despite 5-Fluorouracil (5-FU) is usually the first-choice drug, it does not always bring the expected results. To increase the effectiveness of treatment, new combinations of agents are investigated.
Aim of the study: The aim of our study is to determine the effect of proper combinations of the different cytostatics (5-FU and cyclophosphamide) on the proliferation of CRC cell lines as HT-29 and COLO320.
Material and methods: The study was conducted on ATCC human colorectal cancer cell line HT29 and COLO320. The cell lines were cultured according to the protocol and treated with combination of cytostatics and then the proliferation analysis was performed. Each combination of cells and cytostatics was repeated 3 to 5 times. The proliferation of cells was determined by ELISA BrDU and cytotoxicity using Cytotoxicity Detection Kit. The expression of Bax, Bcl-2, Akt were analyzed at mRNA and protein level (Western Blot, RT-PCR).
Results: We observed a correlation between the concentrations of the cytostatics we used to change proliferation cancer cells which we measured in cell lines HT29 and COLO320. We also observed lower absorbance in combination of 5-FU and CPA (0,927 – HT29; 0,6805 – COLO320) than in using only 5-FU (1,745; 1,0128) or CPA (1,969; 1,2265).
Conclusions: The studies has demonstrated that inhibiting effect of 5-FU on proliferation of colon cancer cells can be severed by CPA. The correlations between concentration of used cytostatics can be used to implement of more effective treatment in the future. However, the obtained results are preliminary, and research on a wider range of cytostatic concentrations should be carried out.
Key words: colon cancer, proliferation, cytostatic.

The overexpression of RORγT in iNKT cells in patients with multiple sclerosis (MS) – preeliminary results

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Introduction: Multiple sclerosis (MS) is a chronic demyelinating autoimmune disease that affects many young people. Although pathogenesis is not yet fully understood, it is well known that immune system is involved in the inflammation ongoing in the central nervous system. The invariant NKT (iNKT) type I cells is a small subset of T cells expressing specific TCR. They are capable of cytotoxic activity and cytokine production.
Aim of the study: The aim of the current study is to evaluate the landscape of iNKT cells in the peripheral blood of relapsing-remitting multiple sclerosis patients. We have previously documented overexpression of RORγT in iNKT cells in MS patients.
Material and methods: Samples of peripheral blood were taken from 15 MS patients and 20 healthy volunteers. Specimens were stained with anti-iNKT FITC, anti-CD3 V450, anti-CD-4 APC-R700, anti-CD8 PE-Cy7, anti-IL-17A PerCp-Cy5.5, anti-IL-4 PerCp-Cy5.5, anti-IL-10 PerCp-Cy5.5, anti-IFN-γ PerCp-Cy5.5, anti-RORγT PE, anti-FoxP3 PE, anti-E4BP4 PE, anti-T-bet PE, anti-GATA3 PE monoclonal antibodies. Next, flow cytometry was performed. Results were statistically analyzed using Statistica 13.
Results: No significant intergroup differences in iNKT, CD4+ iNKT, CD8+ iNKT, CD4+ CD8+ iNKT and CD4-CD8- iNKT percentages were noted. The significant overexpression of RORγT was observed in MS patients. No significant differences were observed in the expression of other transcription factors.
Conclusions: The significant overexpression of RORγT may indicate higher production and secretion of cytokines and may be involved in the pathogenesis of MS. The effect of RORγT overexpression in iNKT cells requires further functional studies.
Key words: MS, flow cytometry, iNKT, autoimmunity.

Saphenous vein graft between a. brachialis and v. cephalica in antebrachial arteriovenous anastomosis

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Introduction: The arteriovenous graft is a frequent procedure for a patient in hemodialysis unit due to easier access of blood vessels. Saphenous vein graft is an approach for the arteriovenous anastomosis between blood vessels, where one end of a saphenous vein is inserted into the artery and another end – into the vein.
Aim of the study: Two general aims were included in this study: to establish length of saphenous vein to create antebrachial anastomosis and to insert saphenous vein into the anterior compartment of the forearm to make the graft.
Material and methods: Materials for dissection of the corpse and procedure were provided by Laboratory of Anatomy of Department of Morphology at the Institute of Anatomy and Anthropology. All measurements were taken by using a Vernier caliper and protractor. V. saphena magna diameter sized incisions were made in a. brachialis and v. cephalica, the great saphenous vein graft was connected to a. brachialis and v. cephalica in the cubital region using Surgipro 7-0 sutures. During the study several scientific sources were used.
Results: Sizes of the anterior compartment of the forearm (254.7 mm) and v. saphena magna (322.75 mm) were measured. Dissection and ligation of the great saphenous vein were done. Diameters of the great saphenous vein (2.12 mm), a. brachialis (4.48 mm), v. cephalica (2.46 mm) and distances (between a. brachialis and v. cephalica (18.01 mm); from v. cephalica incision to the graft folding place (107.3 mm), from a. brachialis to the graft folding place (129.9 mm)) were measured. The angle of the graft folding was detected (80°). The length of the great saphenous vein for a. brachialis and v. cephalica arteriovenous anastomosis creation should be 304.81 mm, if the distance between a. brachialis and v. cephalica in the fossa cubitalis region is 18.01 mm. The distance from a. brachialis and v. cephalica saphenous graft connection region to the middle of the forearm compartment was 128.40 mm. The distance from v. cephalica incision to the graft folding place was 107.3 mm and the distance from a. brachialis to the graft folding place was 129.9 mm.
Conclusions: 1. The great saphenous vein was long enough to make the saphenous vein graft between a. brachialis and v. cephalica in the anterior compartment of the forearm. 2. There is a risk of graft folding, if the great saphenous vein is placed too high due to the forearm flexion and extension. 3. Special information and recommendations are important to choose the right position for the graft.
Key words: arteriovenous graft, hemodialysis, vascular access, anastomosis.

The role of the mitochondria in the ageing process

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Introduction: Ageing is an intrinsic process determined by a progressive, time-dependent deterioration of cellular structure and function caused by the accumulation of cellular damage. Cellular senescence and alterations of mitochondria is one of the nine hallmarks of ageing. In fact, mitochondrial dysfunction has been directly associated with the ageing phenotype and most age-specific diseases.
Aim of the study: To establish how and which mitochondrial dysfunction influences or increases the ageing process.
Material and methods: The research was based on 34 publications, including reviews, articles, booksfrom the PubMed database, period 2014 to present.
Results: The main functions of the mitochondria in the cell are: energy production, oxidative balance (OB) and calcium homeostasis. In humans, ATP-producing capacity decreases by 8% per decades, due to perturbated mitochondrial process like fusion and fission. In contrast, OB has an age-dependent susceptibility, by the instrumentality of excessive reactive oxygen species, defected antioxidants system and mitophagy decline. All of them are associated with an accumulation of damaged mitochondria, oxidative stress and enhanced apoptosis. The mitochondrial DNA contributes directly to the early onset of the damage, because it has a spontaneous mutations rate 10 times higher than that of nuclear DNA. Calcium known as an intracellular regulator, determines the normal activity of the mitochondrial permeability transition pore. Excessive calcium ions that accumulate in the mitochondria, but prolonged opening, leads to the movement of ions and small molecules, generating depolarization of the mitochondrial membrane and in turn releasing pro-apoptotic factors, which results in a reduction of ATP and finally causes cell death.
Conclusions: Mitochondrial dysfunction substantially contributes to biological ageing, although the mechanism had not been fully elucidated. Understanding these connections and the role of the mitochondria in the ageing process is with certitude an important step to develop better methods to slow it down.
Key words: ageing, mitochondria, ROS, mitophagy.

CRISPR – a tantalizing, revolutionary tool for genome editing

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Introduction: Genes profoundly influence health and thanks to advancements in DNA sequencing, scientists have discovered numerous genes associated with risk of disease occurrence. Precise alteration of genes has enormous capacity to treat human diseases. Gene alteration in living cells is complicated, but a recently developed technology CRISPR is said to be promising end for significantly editing DNA of almost every species.
Aim of the study: To determine how CRISPR can be the new generation in treating genetic diseases and to ascertain the evolutions in its functionality.
Material and methods: Data identification: English written literature search using UpToDate, PubMed, Elsevier, Nature.org, EBSCO from 2013-2020 and bibliographic review of obtained articles. Study selection: A cumulative review led to selection of 44 articles which explicitly addressed the declared aims of the review. Data retrieval: Collective assessment for quality evaluation of obtained data based on definitive inclusion and exclusion criteria.
Results: Of 44 articles, 18 studies stated possible implications of CRISPR in humans, 12 of which highlighted Genetic diseases. 8 articles reported latest developments, 4 of which focused on increasing effectiveness of CRISPR by making it cheaper, safer and precise.
Conclusions: An important highlight here is that all these technology approaches are still very much in development. Various studies have been evaluated in animal models, but CRISPR has a long way to go for clinical testing in humans and will take years for its practical implications, hence there is still requirement of further studies to determine benefits for actual implementations.
Key words: CRISPR, Cas, genetic diseases, CRISPR-based technology.

GJB1 gene analysis in CMT patients

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Introduction: Charcot-Marie-Tooth disease (CMT) is the most common hereditary neuropathy representing a group of clinically and genetically heterogeneous sensorimotor peripheral neuropathies. CMT type X (CMTX) is the 2nd most frequent CMT subtype after the CMT1A type, mostly caused by pathogenic variants in the GJB1 gene, including also noncoding first exon. It is not included in the most whole exome enrichment kits and, therefore, pathogenic variants in this exon can be missed if the analysis is performed using whole exome sequencing (WES).
Aim of the study: To detect the frequency of the CMTX caused by the pathogenic variants in the GJB1 gene in the population of Latvia.
Material and methods: For all individuals with suspicion of CMT (n = 144) MLPA analysis was performed to detect copy number variations in the genes PMP22, GJB1, and MPZ. Sequencing of the exons and exon/intron junctions of the GJB1 gene was performed using Sanger sequencing.
Results: From 144 patients – after exclusion of patients with confirmed CMT1A (PMP22 duplication, n = 48) or HNPP (PMP22 deletion, n = 3) there were selected 66 index cases and 93 individuals in total – 47 females and 46 males (in some families multiple family members were included).

In total the CMTX was identified in 4 index cases (6%) and 13 (13.9%) patients in total. Three pathogenic variants were identified in the GJB1 gene – p.Arg215Trp (rs879254099 – for five cases in one family and one separate case), p.Val139Met (rs104894812 – for one family identified in six cases) and p.Lys103Glu (rs1131691322 – in one case). Variants p.Val139Met and p.Lys103Glu, representing seven (7.5%) CMT patients in our study would be missed by a standard WES analysis. Most of the identified familial cases have CMT1A or CMT1X types.
Conclusions: GJB1 pathogenic variants is commonly found among PMP22 negative CMT patients and is probably the second most frequent CMT subtype in the Latvia population. If WES-derived panels are used for the CMT diagnostics, they should be accompanied by Sanger sequencing of the GJB1 first (noncoding) exon. Further diagnostic analysis (e.g. NGS of neuropathy panel genes) is necessary for the unsolved cases.
Key words: Charcot Marie Tooth, CMTX, GJB1.

Transcriptomic profiling of mesenchymal stromal cell-mediated regulation of eosinophilic lung inflammation

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Introduction: Asthma is a chronic inflammatory disease of the airways. Despite significant progress in the understanding of asthma pathogenesis, causative treatment is to date not available. Moreover, some of the patients do not respond to available medication. Therefore, there is a substantial need to develop novel therapeutic strategies. The use of preclinical models allows to better understand mechanisms regulating lung inflammation.
Aim of the study: In this study, we aimed to analyze the effects of mesenchymal stromal cell-mediated regulation of eosinophilic experimental asthma model by using whole lung transcriptomic profiling.
Material and methods: Adipose tissue-derived mesenchymal stromal cells (ADMSCs) were administrated in the experimental eosinophilic asthma model in the course of sensitization or directly after induction of inflammation. The hypothesis-free approach was proposed to assess potential novel mechanisms of ADMSC-mediated regulation of eosinophilic experimental asthma. We performed whole lung RNA sequencing on the Illumina platform (Illumina). Biostatistical and bioinformatical analysis has been performed by using "R" software (R Core Team). Analysis of differentially regulated pathways and bio-functions was performed by using IPA software (Qiagen).
Results: First, we confirmed that ADMSC regulates eosinophilic lung inflammation by using histochemical stainings. Next, by analyzing the differentially expressed gene profiles, we found novel potential mechanisms of MSC-mediated regulation of airway inflammation. Furthermore, we found some intriguing differences in the transcriptomic profiles between used models.
Conclusions: Taking together, we found novel putative mechanisms of ADMSC-mediated regulation of eosinophilic lung inflammation, which may allow us to define novel potential therapeutic targets.
Key words: transcriptomics, asthma, mesenchymal stem cells.

Brain – gut axis elements in the activity-based anorexia (ABA) in rats – the effects of kisspeptin administration

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Introduction: Anorexia nervosa affects 1% of adult females in developed countries. It consists of a restriction of energy intake, intense fear of gaining weight and distortion of the body image. Hypothalamus plays a major role in the regulation of our metabolism sensing peripheral and central signals and activating orexigenic/anorexigenic neuronal responses, mainly mediated by excitatory neurotransmitters (e.g. glutamate) or inhibitory (GABA).
Aim of the study: It has been reported, that kisspeptin, a neuropeptide that promotes cooperation of the neurons in hypothalamus region, plays a role in the regulation of the hypothalamic–pituitary–gonadal axis and influences the reproductive functions of the body. Thus, we hypothesized that kisspeptin may form a crucial link between the energy balance of the body and the normal function of gonads in anorectic patients.
Material and methods: We used an animal model of AN induced by voluntary physical activity and restricted feeding schedule in female Wistar rats and assessed daily body weight gain and food intake. Based on the role of hypothalamus in processes that are believed to be crucial in the development of ABA, we focused our research on the metabolic status of this particular region in anorectic rats and established so-called 'neurochemical profile' of hypothalamus in controls and ABA rats using magnetic resonance spectroscopy methods. We also investigated enteric regulatory cells: interstitial cells of Cajal, telocytes, autonomic cholinergic and nitrergic neurons in the gut by immunofluorescence methods. We then investigated the effects of subcutaneous administration of kisspeptin (20 nmol/rat) on the selected parameters.
Results: ABA rats showed a significant weight loss from the first day. Despite the progressive weight loss, anorexic rats consumed gradually more food each day, but their total food intake reached half of the level of the control group. Anorexia impaired hypothalamic glutamatergic neurotransmission, leading to a decrease in glutamate and GABA levels. Kisspeptin administration partially reinstated these effects. No significant morphological differences between enteric cells in ABA rats after kisspeptin were present.
Conclusions: Kisspeptin seems to partially restore glutamate and GABA signaling influencing the feeding control mechanisms in ABA rats. These results support our hypothesis that the reduced concentration of kisspeptin participates in the multifactorial pathogenesis of anorexia nervosa.
Key words: anorexia nervosa, kisspeptin, rats, telocytes, enteric nervous system, brain-gut axis, activity-based anorexia.

Gynecology, Obstetrics and Case Report

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Case reports

High intensity focused electro-magnetic technology use in treatment of female sexual dysfunction and improvement of sexual function: first experience in Latvia

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Introduction: Sexual health is not only closely linked to woman's reproductive health, but is also a part of the overall health definition. That is why treatment of female sexual dysfunction (FSD) plays undeniable role in the concept of female wellbeing. High intensity focused electro-magnetic technology (HIFEMt) is an innovative method for treatment of weakness of pelvic floor muscles (PFM) as a cause of FSD, based on intense focused electromagnetic fields, causing "supramaximal" contractions of PFM.
Aim of the study: To evaluate HIFEMt as a method of FSD treatment and improvement of female sexual function for non-FSD patients.
Material and methods: 40 women, aged 25 to 45, selected according to specific criteria, underwent ten HIFEM technology procedures according to local regimen. Data was obtained from questionnaires, filled before the 1st, after the 5th and the 10th procedures, using validated Female Sexual Function Index (FSFI) – suggesting FSFI < 26.55 for the diagnosis of FSD – and supplementary questions. Data was processed with Microsoft Excel and IBM SPSS Statistics 22.0.
Results: 87.5% (n = 35) of patients have underwent full procedure cycle. 69% (n = 24) of them had FSD. 60% (n = 21) of patients were nullipara. 50% (n = 7) of those, who had ≥ 1child had episiotomy/ruptures during labor. Mean (SD) FSFI before the start of treatment was 22.50 (4.85) with the lowest numbers in Desire domain (3.10 (1.00)). After the 5th procedure mean FSFI was 27.17 (3.58). After the 10th procedure – 26.92 (3.97) with the biggest changes in Orgasm domain (0.84 (1.37)) after the 5th; 0.93 (1.6) after the 10th. FSFI mean changes were statistically significant (p < 0.05) after the 5th and 10th procedure for FSD group: 5.15 (3.37) and 7.12 (4.81) respectively; and non-FSD group: 1.89 (2.08) and –0.13 (1.9) after the 5th and 10th respectively. 8.5% (n = 3) developed complications after 4th, 7th and 10th procedure.
Conclusions: HIFEMt could be used for treatment of FSD or improvement of sexual function, however in case of prophylactic use, each situation should be considered individually with the regard to initial muscle tonus, possible lack of benefit or even emersion of complications.
Key words: female sexual dysfunction.

Cervical length, measured in the third trimester, as a prognostic factor for preterm labor for nullipara women

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Introduction: Measurement of cervical length (CL) between 18 and 24 gestational week (GW) is a part of routine examination to prevent preterm labor (PL). Same diagnostic tool is not unarguably recommended in the 3d trimester – indicative CL rates at that time vary by source. For this reason for now there is no clear idea about CL as a prognostic factor of PL.
Aim of the study: To analyze cervical length as a prognostic factor for preterm delivery depending on presence of PL symptoms.
Material and methods: A prospective cohort study, conducted in Riga Maternity hospital (RMh), included 68 women, who came for routine 3d trimester USG screening (Group 1) or were admitted to RMh with complains of abdominal pain and contraction (Group 2). Transvaginal ultrasound was performed, measuring CL. Afterwards women were followed-up till the day of delivery. Data was processed with SPSS-Statistics 22.0.
Results: Mean (SD) GW when CL was measured was 32 + 5 (3.1) and 32 + 5 (2.3) GW for Group 1 (n = 44) and Group 2 (n = 24) respectively, p = 0.06. Mean CL was 37.97 (7.4) mm and 33.50 (9.8) mm for Group 1 and Group 2 respectively, p = 0.053, mean difference – 7.44 (2.3) mm. Mean GW at delivery were 39 + 4 (2.14) and 38 + 6 (4.4) GW for Group 1 and Group 2, respectively, p = 0.017. PL (< 37 GW) occurred in 4.5% (n = 2) and 26.1% (n = 6) in Groups 1 and 2 respectively, p = 0.02, PL (< 34 GW) occurred in 2 cases in total, 2.9% (n = 2) both in Group 2. CL less than 25 mm was found in 11.8% (n = 8) cases: 4.5% (n = 2) in Group 1 and 25% (n = 6) in Group 2, p = 0.02. CL less than 30 mm was found in 23.5% (n = 16) cases: 15.9 (n = 7) in Group 1 and 37.5% (n = 9) in Group 2, p = 0.046. CL < 30 mm and CL < 25 mm both had correlation with PL < 37 GW (p = 0.11, p = 0.00).
Conclusions: CL, measured in the third trimester both for symptomatic and asymptomatic patients, could be valuable for the diagnosis of PL and effective management. Further evaluation, including bigger group of symptomatic women, needed.
Key words: cervical length, preterm birth.

Aetiology, treatment and outcome of gynaecology cases complicated by haemoperitoneum: an observational study

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Obstetrics and Gynaecology

Introduction: Haemoperitoneum is relatively uncommon due to gynaecological causes. The diagnosis is based on the clinical suspicion and radiologic findings. Sometimes it can be difficult to distinguish gynaecological from gastrointestinal

and urinary tract emergencies because of overlapping symptoms and signs. There is paucity of data regarding the causes, management and prognosis of this life threatening condition.
Aim of the study: To assess the aetiology, treatment and outcome of gynaecology cases complicated by haemoperitoneum.
Material and methods: A retrospective observational study was conducted in a tertiary health care centre in South India, reviewing medical records of 10 non pregnant women from the period 2014-2018 who underwent exploratory laparotomy for intraperitoneal haemorrhage. Parameters assessed included causes of haemoperitoneum, surgery performed and patient mortality and morbidity. The collected data was compiled in MS Excel master chart and analysed.
Results: During the study period, 7 women had haemoperitoneum due to gynaecological causes. Two of these had rupture of corpus luteal cyst and ovarian cyst in two cases each for which laparotomy and cystectomy was carried out. One case of torsion ovary, endometriotic cyst and follicular cyst each underwent unilateral salpingo-ovariotomy, resection of ovary, ovarian cystectomy respectively. 3 patients (30%) developed haemoperitoneum subsequent to gynaecology surgery. Two (66%) were following Ward Mayo – one had clots and ecchymosis in the retroperitoneum, and the other had clots distending the uterovesical fold with ooze from the upper pedicle. The third case had diffuse ooze from the vault, and infundibulo pelvic ligament after total abdominal hysterectomy and bilateral salpingo-oophorectomy for unilateral ovarian mass. In all these 3 cases no bleeders were identified; religation of pedicles and peritoneal lavage/drainage was performed. None of the patients were in shock at the time of presentation. The volume of haemoperitoneum ranged from 100-3000 ml and 9 patients (90%) required blood transfusion. Postoperatively one patient developed dengue infection and hypocalcemia which resolved with treatment. Hospital stay was uneventful in all the other cases and they were discharged home at an average of 7 days.
Conclusions: Timely diagnosis and management of gynaecological cases presenting with haemoperitoneum will help in improving outcome in this potentially life threatening condition.
Key words: haemoperitoneum, gynaecological causes.

Labor induction in low risk primiparous women and cesarean section risk factors

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Introduction: Cesarean section has become a global problem. It has created discussions about its effect on mother's and perinatal results, as well as reasons of the increasing numbers are unknown. Together with increasing cesarean section numbers, there are also increasing numbers of induced labor.
Aim of the study: The aim of this study is to compare mothers and newborn results between vaginal and cesarean section groups and to evaluate the risk factors of cesarean section in low risk nulliparous population, who underwent labor induction.
Material and methods: The research had taken place in Riga Maternity hospital. In this study nulliparas with one fetus pregnancy who have had induced labor and had no pathologies were included. Participants were divided into vaginal delivery group and cesarean section group. Data was analysed using IBM SPSS Statistics 26.0 program.
Results: There were 215 women included in this study who had their first pregnancy. 64 (29.8%) were delivered by cesarean section and 115 (70.2%) had vaginal delivery. There were no significant results regarding age (p = 0.82) and BMI (p = 0.86) disparity between study groups. Cesarean section group had significantly higher numbers of endometritis cases (p = 0.001), higher blood loss during delivery (p < 0.001) and longer length of stay in hospital after childbirth (p < 0.001). Newborns who were delivered by cesarean section had lower Apgar score in first minute after birth (p = 0.041) and fetal distress (p = 0.002). Bishop score under 6 on admission moment had no significant difference between groups (p = 0.21). Risk factors significantly related to cesarean delivery in our study are primary uterus dysfunction (OR = 4.05, TI 2.19-7.5, p < 0.001), occipito-posterior position (OR = 50, TI 6.46-386.9, p < 0.001), fetal distress (OR = 2.5, TI 1.37-4.63, p < 0.003) and first period duration of delivery longer than 450 minutes (OR = 2.7, TI 1.37-5.45, p < 0.001).
Conclusions: Age and BMI doesn't affect mode of delivery. Cesarean section group had higher amount of blood loss during delivery, higher risk of endometritis development and longer stay in hospital after giving birth. Newborns delivered in cesarean section group had lower Apgar score. The method of induction doesn't affect mode of delivery. The risk factors of cesarean section for low risk nulliparous in induced labor are primary uterus dysfunction, occipito-posterior position, fetal distress and first period duration of delivery longer than 450 minutes.
Key words: induced labor, nulliparas, cesarean section, risk factors.

The influence of the time of antibiotic administration and its correlation to the rupture of membranes (ROM) on the onset of the infectious complications in newborns

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Introduction: Antibiotic prophylaxis in GBS positive women plays a crucial role in neonatal infection prevention. Research works investigating this subject, where the endpoint relied on various methods, have already been created. Currently, it is presumed that antibiotic prophylaxis should be performed before the ROM.
Aim of the study: The study aimed to determine how the time of antibiotic administration and its relation to the ROM influences neonatal inflammation parameters in GBS positive pregnant patients.
Material and methods: The retrospective study included a group of 824 GBS positive patients giving natural birth between 2016 and 2019. 32 cases were excluded due to in-

complete medical documentation. Data such as newborns levels of C-reactive protein (CRP), procalcitonin (PCT), microbiological culture, time of antibiotic administration, and its correlation to the ROM based on medical history. The statistics were conducted comparing increased inflammation indicators to the time of antibiotic administration.
Results: 98 (12.4%) newborns showed increased levels of CRP while 78 (9.8%) PCT. In 17 (2.15%) newborns, bacterial culture was performed and 4 (23.53%) of them received positive results. Both CRP and PCT elevations are correlated with the time of the administration of the first dose of the antibiotic. The newborns whose mothers received antibiotic therapy at least 4 hours before the labour less frequently showed CRP and PCT levels above the norm in comparison to the group receiving antibiotic prophylaxis later and not at all. The number of newborns with negative inflammation markers increased along with time interval between delivery and the first dose of antibiotics. There was no evidence that antibiotic administration before the ROM was more beneficial than after it.
Conclusions: In conclusion, the administration of antibiotics as the GBS infection prophylaxis in newborns is essential where timing plays a crucial role. Further research on antibiotic prophylaxis and ROM correlation is needed.
Key words: GBS, CRP, C-reactive protein, procalcitonin.

Evaluation of Polish women knowledge and opinion about planning pregnancy

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Introduction: The pregnancy and child's development are affected by mother's health and lifestyle not only during pregnancy but also before conception. A healthy lifestyle allows for the proper development of pregnancy and reduces risk of obstetric and neonatological complications.
Aim of the study: The survey was aimed to examine the approach of women to birth control, changes in physical activity and diet, the application of preventive vaccinations, changes in lifestyle hygiene (sleep, work, stimulants) before pregnancy and during potential pregnancy.
Material and methods: The research was carried out on a group of 157 women using a personalized survey consisting of 54 questions about demographic data, diet, physical activity as well as the attitude of the respondents towards vaccinations and dietary supplementation before planned pregnancy.
Results: The vast majority of respondents (90.4%) admitted they had ever thought about the changes they would like to introduce before planned pregnancy. The issues most often thought about included diet (98.1%), physical activity (96.2%) and reduction of stress in personal life (68.8%). It was important for the respondents to introduce changes in their diet both before and during pregnancy. Most women (72%) planned to introduce supplementation into their diet - primarily folic acid (70.1%) and iron (52.2%). Iodine is taken into account by the vast minority (15.3%). The study showed that 82.1% of respondents do not see the need for any vaccination before pregnancy, and almost 30% are against any vaccination during pregnancy. Over half (58.8%) of respondents intend to stop smoking in the first trimester of pregnancy, and 45.7% declare they will stop drinking alcohol at that time. Most women (66%) declare their will to continue consumption of caffeine-containing beverages during pregnancy.
Conclusions: Conducted research shows that women's awareness of many aspects affecting planning pregnancy is insufficient. As shown above there is a need to educate women about recommended lifestyle changes before and during pregnancy. Popularization of knowledge in this field may result in decreasing the number of obstetric and neonatological complications.
Key words: planning pregnancy, dietary supplementation, preventive vaccinations, survey, obstetric complications, neonatological complications.

Women's knowledge about breast cancer prevention, with particular attention to pregnancy and lactation period

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Introduction: Pregnancy-associated breast cancer (PABC) affects approximately 1 in 3000 pregnant women. The diagnosis of PABC is particularly challenging. Therefore women, also pregnant or breastfeeding, should be educated about the importance of the preventive actions they should take to increase the chances of avoiding this disease or at least diagnosing it at an early stage.
Aim of the study: To assess the knowledge of women, between 20 and 50 years of age, about breast cancer (BC) prevention, with particular attention to gestation and lactation periods.
Material and methods: A questionnaire survey consisting of 54 question, divided into 4 sections concerning: demographics, respondents; knowledge about BC and its prevention, individual risk factors and performed preventive actions, also during pregnancy and lactation.
Results: 1336 properly filled out questionnaires were obtained, including 911 filled out by women pregnant at present or/and in the past. 85.8% of respondents are aware that BC is the most common malignancy among women in Poland. Internet is the source of information for 91.4% of women, doctors – for 50.8%. Breast self-examination is performed by 69.3% of respondents, however, once a month – only by 40%. 63.5% of women have never had breast examination performed by a doctor, 44.6% – have never had breast ultrasound. 88.9% of respondents know BC may occur during pregnancy and/or lactation. However, only 51.8% of women pregnant at present and/or in the past and 54.8% of 704 women with a history of breastfeeding, were actually performing breast self-examination during those periods. 21% of respondents had their breast examined by gynaecologists during their obstetric appointments. 16.2% of women had a breast ultrasound during pregnancy, 17.2% – during lactation.

Conclusions: Women's knowledge about risk factors of BC is not sufficient. There is a constant need for educational actions about BC prevention. Considering the majority of women proclaimed Internet as their primary source of information, social media appear to be an appropriate channel to reach them.
Key words: breast cancer, pregnancy-associated breast cancer, lactation, breast self-examination, breast cancer prevention, breast ultrasound.

The role of niraparib drug in newly diagnosed advance ovarian cancer

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Introduction: Niraparib is a highly selective inhibitor of polyadenosine diphosphate ribose polymerase(PARP) which is being related to the advancement and long endurance of patients with repetitive ovarian carcinoma after platinum-based chemotherapy, despite whether the patients had breast cancer gene(BRCA) mutations or not. The adequacy of niraparibin patients with recently analyzed progressed ovarian cancer after first-line platinum-based chemotherapy is obscured.
Aim of the study: To find an application of niraparib as an alternative or adjunct to current treatment regimens in recurrent ovarian cancers.
Material and methods: I have studied 40 relevant articles from multiple electronic databases(Pub Med, US food and drug administration, the journal of England, and EBSCO). The main key terms that were: Efficacy of niraparib drug, comparison, of niraparib with the pre-existing drug, and its metabolism. Of the 40 articles, I have reviewed, 10 articles that provided highly significant information regarding niraparib and rest were discarded. data were collected from August 2017 to December 2019.
Results: Niraparib has shown great efficacy in recurrent ovarian cancers due to its mode of actions as a highly selective inhibitor of PARP1 and PARP2 enzyme. As compared to other drugs niraparib works in both BRAC and non-BRAC mutated patients and also inhomogeneous recombination deficient patients. The metabolism of niraparib drugs compared to other pre-existing therapies is easily metabolized and conjugated by hydrolytic enzymes.
Conclusions: The potency of niraparib is to procrastinate the future growth of tumor cells, regardless of undergoing certain types of mutations or not. Treatment modality which includes PARP family enzymes in the oncology therapies can thus be very encouraging treatment therapy for advanced ovarian cancer.
Key words: niraparib drug, polyadenosine diphosphate ribose polymerase (PARP), recurrent ovarian cancer, breast cancer gene mutations (BRAC).

Impact of gestagenic component and woman's age on side effects during intake of hormonal contraceptives

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Introduction: Hormonal contraception is currently one of the most commonly applied methods for preventing pregnancy. Medical products containing estrogen and gestagen components are also used to regulate the monthly cycle and to alleviate undesirable symptoms associated with it, as well as to treat other hormonal disorders.
Aim of the study: The main aim of the research is to collect the most common adverse effects focused on the area of mental and sexual health among women between ages 17 and 55 who use or once used hormonal contraception.
Material and methods: Our research relies on a detailed survey, divided into five sections: 1. Characteristics of the respondent; 2. Hormonal products used; 3. Mental state and mood changes while using hormonal contraceptives; 4. Sexual life; 5. Other side effects. 804 respondents took part in our research who use or once used hormonal contraception. Women were divided into subgroups depending on the type of gestagen component of the preparation used as well as age.
Results: Among women who took part in the survey 65.2% used the combined hormonal pill, 18.7% – progestin-only pill, 6% – intrauterine device, 5.4% – contraceptive vaginal ring. Most commonly mentioned side effects were dicrease in libido (40.6%) and mood swings (39.3%). Women who took medications containing desogestrel experienced the least side effects (70% admitted negative side effects) and the most – women who took specifics with etonogestrel (91.6%). Difference is also seen depending on the age of questioned women. Sexually active women under 30 years old didn't see any changes in 33.4% while group of women of more than 30 years old – only in 25.8%. Questioned women reported side effects that also vary depending of the age.
Conclusions: Hormonal contraceptives have an impact on mood and both mental and sexual health of the majority of women who took part in the survey. Frequency of chosen side effects vary depending on gestagenic component and woman's age. Based on our results, we can make a conclusion that despite side effects, only a small percent of women report their complaints to gynaecologist or other medical specialist.
Key words: contraception, mental health, sexual health, estrogen, progesterone.

Pregnancy after liver transplant: maternal and perinatal outcomes

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Introduction: Liver transplantation is a life-saving and successful therapeutic procedure which is more and more frequent worldwide, also among women of reproductive age. Consequently, there is an increasing number of reports of pregnancy following liver transplantation, but doubts still exist regarding preconception counseling and the optimal method of managing pregnancy.

Aim of the study: The aim of this study was to report and evaluate pregnancy outcomes in women who had undergone liver transplantation.

Material and methods: We retrospectively analyzed female patients after orthotopic liver transplantation who reported pregnancy and were under medical care of one transplant center.

Results: We identified 13 pregnancies in 10 women who had undergone a liver transplant (12 childbirths and 1 induced abortion due to fetal death in I trimester). Causes of transplant include congenital or acquired disorders and the most common indication for liver transplantation was autoimmune hepatitis (50%). The mean age at transplant was 28.5 years (range 21-36), mean maternal age at pregnancy was 32 years (range 26-43), and transplant-to-pregnancy interval was 4.07 years (range 1.5-7). The mean gestational week was 36.67 (range 31-40). Immunosuppression was maintained with combinations of prednisone (n = 11), tacrolimus (n = 13), and azathioprine (n = 8) prior to and during pregnancy. Two pregnancies were unintended, so women took mycophenolate mofetil in the first weeks of gestation. Another two women stopped taking azathioprine due to increasing anemia. Maternal complications included increase of aspartate transaminase and alanine transaminase (n = 2), anemia (n = 4) and hyperthyroidism (n = 2). Among the 12 total childbirths, 5 (41.67%) were preterm. Only 5 women entered labor spontaneously, while 7 (58.33%) presented cesarean delivery.

Conclusions: Pregnancy after liver transplantation can achieve relatively favorable outcomes. Liver transplant does not influence women's fertility and during pregnancy, we report low rates of minor graft complications and no major issues. Multidisciplinary team should be involved in contraceptive, fertility and consequently pregnancy counseling of female transplant recipients.

Key words: liver transplant, OLTx, pregnancy.

Concomitant adenomyosis and leiomyomata effects on endometrial cancer's clinical and pathological features

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Introduction: Adenomyosis and leiomyomata are the most common gynecological pathologies of uterus body while in developed countries endometrial cancer is the most common malignancy of the female reproductive tract.

Aim of the study: We aimed to analyze possible effect of coexisting leiomyomata and adenomyosis on clinical and pathological features of endometrial cancer i.e. staging, grading and angioinvasion.

Material and methods: In a retrospective analysis of 523 endometrial cancer cases four groups of patients were distinguished: with concomitant leiomyomata (n = 278); with adenomyosis (n = 46); with leiomyomata and adenomyosis (n = 40); without leiomyomata or adenomyosis (n = 160). The analysis was made using chi-square test and $p < 0.05$ was considered as statistically significant.

Results: Tumor stage (S) 1 was predominately found in patients with concomitant adenomyosis [S1/S2/S3 – 37 (80.43%)/1 (2.17%)/8 (17.39%)] and adenomyosis with leiomyomata [24 (60.00%)/1 (2.50%)/15 (37.50%)] compared to women with solely leiomyomata [214 (77.26%)/32 (11.55%)/31 (11.19%)] or without any benign disease [94 (58.75%)/22 (13.75%)/44 (27.51%)], with $p < 0.01$. Tumor grade (G) 1 was predominately found in patients with concomitant adenomyosis [G1/G2/G3 – 21 (45.65%)/13 (28.26%)/12 (26.09%)] and adenomyosis with leiomyomata [17 (42.50%)/15 (37.50%)/8 (20.00%)] compared to women with solely leiomyomata [107 (38.49%)/133 (48.01%)/37 (13.31%)] or without any benign disease [47 (29.38%)/79 (49.38%)/34 (21.25%)], with $p = 0.024$. The percentage of angioinvasion was lowest in patients with concomitant leiomyomata [44 (15.88%)], comparable in groups with adenomyosis [8 (17.38%)] and both leiomyomata and adenomyosis [7 (17.50%)] and the highest in women without any benign disease [48 (30.00%)], with $p = 0.0047$.

Conclusions: The conclusion might be made that the presence of benign pathologies of the uterus influences the pathological features of the endometrial cancer. The probable explanation of this phenomenon is the inflammatory environment that is caused by adenomyosis or other factors caused by leiomyomata. Further investigation is needed to understand precise mechanisms of those correlations.

Key words: endometrial cancer, leiomyomata, adenomyosis, angioinvasion.

Association between endometrial cancer regional lymph nodes metastases and the presence of leiomyomata, endometriosis

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Introduction: Endometrial cancer is the most frequent cancer of gynaecological tract in developed countries. Benign pathological changes of uterus (leiomyomata, endometriosis and adenomyosis) often coexist with endometrial cancer, hence we decided to analyse whether they coincide with the presence of metastases in lymph nodes.
Aim of the study: The aim of this study was to evaluate the occurrence of adenomyosis, endometriosis and leiomyomata in women suffering from endometrial cancer depending on the presence of metastases in lymph nodes.
Material and methods: 432 women from the Department of Gynaecological Oncology of the University Hospital were enrolled to one of the following groups: 1) women with involved lymph nodes (n = 49) and 2) women with non-involved lymph nodes (n = 383). The presence of adenomyosis, endometriosis, leiomyomata as well as grading have been determined. U Mann-Whitney and chi2 test were applied and p-value < 0.05 was considered statistically significant.
Results: Median age in groups 1) and 2) was respectively: 59 (interquartile range 15) and 50 (14) (p = 0.626). The incidence of high-grade endometrial cancer (G3) was significantly increased in the group with the lymph nodes metastases [n = 19 (38.78%) vs. n = 57 (14.88%)] (p = 0.012). The number of patients with adenomyosis in groups 1) and 2) was 8 (16.33%) and 61 (15.93%) respectively with p > 0.05. Endometriosis was present in 9 women in group 1) (18.37%) and 55 women in group 2) (14.36%) with p > 0.05. On the contrary leiomyomata occurred less frequently in the group with involvement of the lymph nodes [n = 18 (36.73%)] compared to the group with free nodes [n = 245 (63.97%)] (p = 0.008).
Conclusions: The analysis of the data has shown a correlation between presence of leiomyomata and lymph nodes involvement. Hence leiomyomata might be a protective factor for the occurrence of metastases in the lymph nodes. To confirm a potential underlying mechanism further investigation is needed. The involvement of lymph nodes corresponds with higher grading of the tumor, what has been confirmed in other studies.
Key words: endometrial cancer, leiomyomata, endometriosis, lymph nodes, metastases.

Atonic postpartum haemorrhage – its most common causes

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Introduction: Postpartum haemorrhage (PPH) is one of the most common complications that occur after delivery. PPH divides into early-onset and late-onset haemorrhages. Atonic PPH possesses as early-onset PPH and is the most common one. In the past 10 years, the incidence of PPH was 8.7% worldwide and every seventh case from those was due to atonic uterus. Every fourth maternal death was due to PPH and it was the leading cause of maternal mortality all around the world.
Aim of the study: This research aims to understand the most common causes of atonic PPH.
Material and methods: This retrospective research included 224 patients who were diagnosed with Atonic postpartum haemorrhage and hospitalized in Riga Maternity hospital from 2018 to 2020. The data from patient medical histories were collected about the reproductive history, prenatal period, childbirth. The information was compared with a control group that consisted of 224 patients who were also hospitalized in Riga Maternity hospital from 2018 to 2020 and had their medical histories right next to the study group's medical histories. Data were analysed using chi-squared tests. Analysis was performed using IBM SPSS Statistics version 22.
Results: In total, 448 patient histories were analysed. The data for patients with Atonic PPH was compared with the control group. Statistically significant results using chi-squared tests were revealed in fetal macrosomia (p = 0.000; 32.6% vs. 20.6%) and unplanned cesarean sections (p = 0.000; 13.4% vs. 6.3%). Almost statistically significant results were in twin pregnancies (p = 0.006; 5.4% vs. 0.9%). The most common causes of atonic PPH were the dysfunction of uterus (36.2%), fetal macrosomia (32.6%) and women with induction of labour (29.0%).
Conclusions: The risk factors with the highest statistical significance are fetal macrosomia, unplanned cesarean sections and twin pregnancies, that corresponds with other researches worldwide. Statistic significance is weak because of a small study group of patients. It is impossible to exclude atonic PPH due to different causes but it is very important to understand the most common risk factors so that they can be modified in the antenatal period if possible.
Key words: postpartum haemorrhage (PPH), atonic uterus.

Impact of symptoms experienced during menstrual cycle on daily activities depending on body mass index

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Introduction: Menstrual symptoms, for example heavy menstrual bleeding, cramping are widespread symptoms among the general population and have a significant impact on women's quality of life. More than half of women experience period pain that may be so severe that they do not attend work or school.
Aim of the study: The aim of this study was to evaluate the possible impact of body mass index on daily activities during menstrual cycle.
Material and methods: Cross-sectional survey was carried out. Structured questionnaires were used to collect data. A total of 910 questionnaires were analyzed. IBM SPSS software was used for data processing.
Results: The study included 910 women. Mean age of women was 27.4 (SD = 8). Mean BMI was 23.1 (SD = 4). 67.9% (n = 618, SD = 2) had normal body mass index. Most women's menstrual cycle length was 29-34 days long (n = 293) and menstruation was 4-6 days long (n = 686). 86.5% (n = 787) of all women had experienced menstrual cycle related symptoms during lifetime, 93.4% (n = 71) with BMI < 18.5 and 77.8% (n = 42) with BMI > 30. Premenstrual symptoms had experienced 65.2% (n = 593) women. Menstrual symptoms experienced 82.1% (n = 747) of all women, with BMI < 18.5 90.8% (n = 69), while women with BMI > 30 74.1% (n = 40). On a scale from 1 to 5, these symptoms affected daily life on average 3.3 of all women, the most affected women were with BMI > 30 by an average 4.4. 70.1% (n = 551) of all women had to discontinue their daily duties due to menstruation symptoms, most were women with normal BMI (n = 373). During menstruations daily activities were affected on average 10.7 hours (for women with BMI > 30-31.8 hours) while sport activities 12.1 hours (BMI > 30-23.6 hours). There is a statistically significant difference between the body mass index and how many hours of daily activities were affected (p = 0.01). On a scale from 1 to 10, average pain level experienced for all women was 7.4, most pain experienced women with BMI < 18.5-22.4% (n = 17).
Conclusions: To conclude, results of study imply that 9 from 10 women had experienced menstrual cycle related symptoms. Most affected women were with BMI < 18.5, these women also experienced higher pain, although their daily and sport activities were affected less time, comparing women with BMI > 30. There is a need to obtain a nationwide overview of menstrual symptoms and their impact on everyday activities.
Key words: menstrual symptoms, daily activities, pain, body mass index, BMI.

The Polish women's experience and level of knowledge about fertility and its disorders

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Introduction: According to World Health Organization infertility is defined as the failure to conceive within 12 months of regular unprotected sexual intercourse (2-4 times a week). This problem, recognized by WHO as a social disease, affects approximately 10-15% of couples in Poland.
Aim of the study: To assess the experience and knowledge of Polish women, up to the age of 50, about fertility and its disorders.
Material and methods: A questionnaire consisting of 44 questions, divided into 6 sections concerning demographics, personal health data, respondents' knowledge about menstrual cycle, infertility and its diagnosis was created. The questionnaire was available in social media from January till February 2020. Statistical analysis was performed with the use of Statistica software.
Results: 3321 correctly filled out questionnaires were obtained, including 1127 filled out by women that neither had been nor were pregnant at the time of survey. The majority of responses were obtained from women aged 26-30, with higher education. The most common source of information about infertility, marked by 77.6% of women, is the Internet, while only 42.5% got the information from their doctors. As many as 65.2% of respondents do not know which days in the cycle are fertile days. 42.6% of respondents do not know that ovulation occurs about 14 days before the onset of the next period, 40.3% of them are not aware that fertilization takes place in the fallopian tubes. Women, who have been and/or are currently pregnant, more often answered correctly than those who had never been pregnant. 35.4% versus 33.8% (p < 0.001) can define when fertile days occur, 59.7% versus 52.8% (p < 0.001) know when ovulation occurs. 60.3% of women who have already been pregnant properly indicated 1 year as the definition of infertility, in comparison to 55.8% of respondents who have never been pregnant (p < 0.001).
Conclusions: The study has shown that knowledge about fertility and its disorders is not satisfying among Polish women. Due to the growing problem of infertility additional education related to that problem is required. It should mostly concern basics of reproductive physiology and menstrual cycle.
Key words: fertility, infertility, menstrual cycle, pregnancy.

What do pregnant women in Poland think about preventive vaccinations?

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Introduction: Vaccines recommended for pregnant women are those against influenza and pertussis. Anti-vaccination movements are becoming more and more popular, which may turn into a lack of conviction to vaccinations during pregnancy due to fetus safety. The study is to indicate the basic reasons for making decisions about refusing to vaccinate during pregnancy.
Aim of the study: The research goal was to check awareness of pregnant women regarding the impact of preventive vaccinations conducted during pregnancy on the fetus development and to collect opinions on the Immunization Programme.
Material and methods: The study was conducted as an anonymous questionnaire among 426 women staying in the maternity department at the Gynecology and Obstetrics Clinical Hospital in Poznań. The questionnaire consisted of 40 questions. It contained questions about vaccinations carried out both before and during pregnancy and assessed awareness about importance of vaccinations for the proper development of the child. Women's opinions about the need for preventive vaccination in children were also examined.
Results: Only 7% of women were vaccinated against influenza and pertussis during pregnancy. Our study revealed significant correlation between place of residence and vaccination during pregnancy – women who were vaccinated were mostly from bigger cities. 64% of pregnant women receive information about preventive vaccinations recommended during pregnancy from a gynecologist. 25% and 32% of women, respectively, are aware of the benefits of vaccination during pregnancy against influenza and pertussis. Only 73% of patients consider the Immunization Programme necessary. Despite this, 97% of respondents plan to vaccinate their children. Our study also revealed significant positive correlation between womens' and their environment's opinion about vaccination.
Conclusions: Small percentage of pregnant women decide to carry out vaccinations recommended during pregnancy so this is the area of activities that should be performed to increase vaccination among pregnant women. Despite the growing popularity of anti-vaccination movements, most respondents see the need for general immunization and declare their willingness to vaccinate their children.
Key words: pregnancy, vaccines.

Use of stimulants by pregnant women in Poland

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Introduction: Smoking and drinking alcohol are still very popular among women in Poland, which may result with difficulties in quitting smoking for the time of pregnancy. Caffeine, considered harmless, can be excessively consumed by pregnant women and have a negative effect on fetal development. The study is aimed at assessing the readiness to introduce changes in the field of the stimulants.
Aim of the study: The study was designed to assess pregnant women awareness concerning effects of stimulants on the proper fetal development.
Material and methods: The study was conducted in the form of an anonymous questionnaire at the Gynecology and Obstetrics Clinical Hospital in Poznań among 426 women staying in the maternity department. The survey contained questions about the knowledge about the effects of various stimulants, also those commonly considered safe, on fetal development.
Results: 85% of pregnant women realize drinking even small amounts of alcohol carries a high risk for the proper development of the fetus, and in case of large amounts of alcohol – it is 98% of respondents. 89% of women rated smoking as highly risky for the fetus, but only 69% rated so in the case of passive smoking. 55% of women did not receive from the doctor any information about the safety of alcohol use in pregnancy. 96% of respondents consumed tea but only 10% drank Rooibos tea. Our study revealed significant negative correlation between the level of education and exposure to secondhand smoke at home. There is also significant correlation between whether a woman has ever smoked and her opinion on harmful effects of tobacco smoke on the fetus. Non-smoking women consider smoking more harmful in comparison to smokers.
Conclusions: Tea consumption by pregnant women is common, however, those recommended for pregnant women have low popularity. The surveyed women are aware of adverse effects associated with high intake of alcohol and smoking cigarettes, however, they perceive passive smoking and small amounts of alcohol consumption as less harmful to the child's health. Therefore, it is justified to inform patients about harmful effects of passive smoking and any amount of alcohol on the proper development of the fetus.
Key words: pregnancy, stimulants, smoking, newborn health.

Case reports

Stillbirth in a patient with hydatid mole

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Introduction: Molar pregnancy is a rare trophoblastic growth disease. We distinguish between complete mola hydatidosa which does not contain fetal tissue and where all of the diploid genetic material comes from father and partial molar pregnancy, that is most often triploid, contains 2 haploid sets of paternal and one haploid set of maternal genes. Fetus can develop from incomplete mole, but may have numerous malformations. The diagnosis of molar pregnancy is based on an USG examination and bHCG level. The final diagnosis is made on the basis of the histopathological examination of the material from the uterus.
Case report: The patient was admitted in the 20 + 1 weeks of GI PI to the Department of Obstetrics and Perinatology UH in Cracow in order to induce miscarriage due to the stillbirth coexisting with mola hydatidosa and Rh incompatibility. On admission the ultrasound examination revealed one fetus with no heartbeat, CRL 9.32 cm (corresponds to 15 weeks of pregnancy) and visible spina bifida. Moreover, the uterus was filled with enlarged placenta with multicystic spaces and the ovaries were enlarged by numerous tecalutein cysts. Gynecological examination was normal. Based on an amniocentesis performed in 15 weeks of pregnancy, a triploid karyotype 69 XXX was found. The patient received misoprostol in a dose of 0.2 mg into the posterior vaginal fornix to induce the miscarriage. Due to the massive vaginal bleeding, fetal removal was performed instrumentally in the operating room under spinal anesthesia. Postoperative material was sent for histopathological examination. The dillation and curretage procedure was performed. The procedurę was carried out under USG control without complications. Anti-RhD immunoglobulin was administered as recommended. In subsequent tests a downward trend in B-hCG was noted.
Conclusions: Molar pregnancy may be associated with an excessive vaginal bleeding. The Operating Room team shall be prepared for the possible surgical procedure. After evacuating material from the uterus, persistent trophoblastic growth disease or mola invasiva may develop. For this reason, it is essential to control hCG levels after surgery.
Key words: molar pregnancy, mola hydatidosa, stillbirth, miscarriage.

Rare neurological complication after cesearean section

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Introduction: Cerebral venous sinus thrombosis (CVST) is an infrequent type of stroke, caused by a clot forming in one of the cerebral sinuses. It is a rare disease that occurs in 5 people in 1 million annually and is mortal for 3% of cases. Risk factors associated to CVST include pregnancy, surgery, lumbar puncture or inherited thrombophilia.
Case report: The patient was a 33-year-old woman G3, P2, admitted to the Obstetrics and Perinatology Ward of Jagiellonian University Hospital in Cracow at 39+5 weeks of gestation. In her past medical history C-section was performed because of no progres in labor. On admission there were no abnormalities. After one day of hospitalisation the patient was qualified for a caesarean section with subarachnoid anesthesia. During the surgery there were signs of high spinal anesthesia with suspicion of respiratory insufficiency. The patient was intubated and transferred to the intensive care unit. After a few hours the patient was extubated. The following day she was transferred to the maternity ward, from where she was discharged after 3 days. Three days later the patient was readmitted to the hospital because of headache, back pain and tingling sensation of her right thigh. In laboratory test D-dimer level was elevated. Performed CT revealed CVST – blood clots were present in the left transverse, sigmoid sinus and the left internal jugular vein. The patient was then transferred to the Neurology Ward where alexia and aphasia occured and cerebral venous infarction of temporal and parietal lobes were diagnosed. The patient was successfully treated with heparin and painkillers. Discharged home in a good condition, with residua of dyslexia. Tests performed during the postpartum period did not reveal coagulation defects.
Conclusions: CVST is a severe disease that can result in long-term neurological effects. The disease poses a certain challenge in diagnosis, especially in patients with nonspecific symptoms such as headaches and minimal neurological deficits. As a potential group at risk, all women in postpartum should be carefully screened for potential development of CVST symptoms.
Key words: thromboembolism, thrombosis, caesarean section.

Postpartum complications: idiopathic postcesarean collection of fluid in a recto-uterine pouch

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Introduction: Ascites is a presence of abnormal fluid accumulation within the peritoneal cavity. There are many different reasons associated with that condition such as portal venous pressure, neoplasm, hypoproteinemia or peritonitis.
Case report: The patient was a 32-years old woman, gravida 1, para 1, admitted to the Obstetrics and Perinatology Ward at University Hospital in Krakow at 37+6 weeks of gestation (gw) due to a suspected heart defect of a foetus. In 40 gw the cesarean section was performed because of absence of progress in the second stage of labor. A male baby of 10 APGAR points was delivered. On the third day following the surgery an episode of a fever of 39°C occurred. There were no abnormalities found upon the examination. On the fifth day after the surgery the temperature fixed at 39 degrees and a mass of 6 cm diameter was found during

the physical gynecological examination and transvaginal ultrasound examination. Due to the suspicion of haematoma located within the recto-uterine pouch the patient was qualified to re-laparotomy. During the operation an accumulation of 900 ml of serous fluid was found within the pouch of Douglas. Both surgical and urological consultations during the procedure revealed no significant findings. A vaginal swab and a urine sample showed a minor colonisation by *E. coli* ESBL+, successfully treated with Meropenem. The patient was discharged home in a good condition 18 days after the cesarean section and 11 days after the relaparotomy.
Conclusions: Postoperative ascites is a very rare complication of caesarean delivery, which can be a result of iatrogenic injuries to the intestines or urinary tract. However, all these causes were ruled out for the described patient. An expanded diagnostic could not identify any definitive reason for the process that could explain the observed state of the patient and her symptoms. In such cases, idiopathic, allergic or inflammatory peritoneal reaction may be the final diagnosis.
Key words: ascites, recto-uterine pouch, obstetrics, c-section.

The pregnant patient with nonclassic congenital adrenal hyperplasia – case report

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Introduction: Nonclassic congenital adrenal hyperplasia (NCAH) is an autosomal recessive condition affecting the adrenal glands. It results in lack of one of the enzymes involved in hormonal transformations and it can manifest as a metabolism disorder. NCAH during pregnancy is a rare condition. Women often struggle with infertility.
Case report: A 28-year-old primigravida with NCAH (21-hydroxylase deficiency) was admitted at 37+4 week of gestation (WOG) to Department of Obstetrics and Perinatology University Hospital in Cracow in the first stage of labor. The course of pregnancy without complications. During the pregnancy the levels of electrolytes were monitored – within normal limits (WNL). From 6th WOG the patient was treated with dexamethasone and the treatment was continued until 33 WOG. The patient delivered without any complications and was discharged with newborn on the 6th day after delivery in good general condition. A female newborn, delivered in longitudinal-occipital presentation, naturally in a good condition, weight 3360 g, length 53 cm, Apgar Scale 10, physical examination, female urinary and reproductive organs WNL. During hospitalization the levels of glucose and electrolytes were controlled. On the 4th day of life, the newborn was subjected to phototherapy due to hyperbilirubinemia 293 umol/l.
Conclusions: Women with NCAH might struggle with infertility and are at higher risk of preterm delivery. Because of complications in newborns, woman should be treated with steroids at a very early stage of pregnancy to prevent intrauterine virilization of a female fetus who might inherited the disease. Precise complex examinations of infants ought to be carried out right after birth.
Key words: 21-hydroxylase deficiency, nonclassic congenital adrenal hyperplasia, NCAH, pregnancy.

Fetus with cardiomegaly – case report

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Introduction: Cardiomegaly is an increase in the silhouette of the heart in comparison to the chest size. Fetal cardiomegaly is a rare complication. The most common causes are: heart failure, Ebstain anomaly and tricuspid valve atresia.
Case report: 33-year-old patient GIII PII was admitted at 32+3 week of gestation (WOG) to Department of Obstetrics and Perinatology University Hospital in Cracow due to diagnosed fetal cardiomegaly. An echocardiography showed an enlarged heart shape along with secondary mitral and tricuspid regurgitation. After additional tests, no causes of cardiomegaly were found – heart disease, pulmonary hypertension and intrauterine infection were excluded. Symptomatic treatment with digoxin was included. After reaching the therapeutic level of digoxin in the fetus, the patient was discharged home with a recommendation to continue therapy. She remained in outpatient care. In 37 WOG, due to fetal breech presentation, the patient was qualified for caesarean section. The female was born in a good general condition and received 9/9/9/9 points on Apgar scale. In the physical examination, a systolic murmur (4/6 on Levine scale) over the heart was found. In addition, the study found significantly increased NT-proBNP and slightly increased CKMB and troponins. In echocardiography, prenatal diagnosis was confirmed. In the 12th day of life, the child in a stable condition was moved to the Cardiology Clinic of the Children's University Hospital in Cracow for further diagnosis and treatment.
Conclusions: Fetal cardiomegaly is a serious complication of pregnancy. It is not always possible to find a cause prenatally. Symptomatic treatment enables giving birth to the child in good condition and introducing further treatment.
Key words: cardiomegaly, tricuspid regurgitation, mitral regurgitation, pregnancy.

Successfully delivery and treatment of Hodgkin lymphoma diagnosed in patient at 4 week of pregnancy with achievement of complete remission – a case report

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Introduction: The malignant neoplasm, like i.a. Hodgkin's Lymphoma (HL), can occur during pregnancy and patient's management becomes then a serious therapeutic challenge. Nevertheless, it may be associated with a good prognosis for both the patient and the fetus. I report a case of postnatal treatment of HL diagnosed during pregnancy.
Case report: Diagnosis: A 30-year-old woman in the 4th week of gestation (WG) was referred to the Hematology Department because of the three-week history of cervical lymph nodes enlargement and the left supraclavicular nodal con-

glomerate. The biopsy revealed Nodular Sclerosis classical Hodgkin lymphoma. Based on the available diagnostic methods the Ann Arbor staging was assessed as IIB. Observation and delivery: At the subsequent every 4-week follow-up visits the patient was in a good general condition. The chemotherapy was postponed as long as possible because of fetal protection. In 10th WG a periodic cough appeared. Due to its exacerbation mediastinal MRI was performed showing significantly enlarged tracheal lymph nodes. The symptoms did not progress so the observation was continued. In 38th WG urgent delivery by CC was performed because of intrauterine fetal asphyxia. The female newborn with infection signs was admitted at neonatal ICU. Treatment: Postnatal PET/CT examination showed a metabolically active lymphoproliferative process involving multiple lymph nodes on both diaphragm sides infiltrating the lung tissue and spleen – Ann Arbor stage IVB. The patient was qualified for treatment with 2 cycles of escBEACOPP scheme continued by 4 cycles of ABVD regimen. CR was reached. At the last follow-up visit (2 years after diagnosis) the patient was in good general condition, without symptoms. The relapse of HL was not revealed.
Conclusions: The benefits and risks to the mother and the child resulting from HL-therapy in pregnancy should be considered. Because of the fetal well-being the commencement of chemotherapy should be possibly delayed, at least until the beginning of the second trimester. Appropriate patient support and vigilant observation of the clinical status are necessary. The disease stage and presence of unfavorable prognostic factors should be properly assessed.
Key words: Hodgkin lymphoma, pregnancy, postnatal treatment.

Young woman with ovarian cancer: excellent survival, Latvian experience in ovarian cancer treatment

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Introduction: Ovarian cancer is gynecologic malignancy with bad prognosis because it is usually diagnosed at advanced stages. Primary cytoreductive surgery with no residual macroscopic disease is a worldwide accepted standard resulting in a better survival when compared with neoadjuvant chemotherapy and interval debulking surgery. Although Latvia has the highest incidence between European countries, there is still no accredited Ovarian cancer surgery center at the moment. This is very important to implement high quality surgery for all ovarian cancer patients to have at least 50, but preferably 70-80% primary complete cytoreductive procedures.
Case report: A 22 year old woman presented with pressure and pain in her lower abdomen for the last 6 months. In a transvaginal ultrasound a 5.3 cm large cystic mass in the right ovary with irregular septation was found. CA-125 was 629.3 U/ml and HE4 – 141 pmol/l, ROMA index was 54.8%. Abdominal CT showed ovarian malignancy, wide peritoneal dissemination, retroperitoneal lymphadenopathy, ascites. During the primary surgery total hysterectomy, salpingo oophorectomy, omentectomy, systemic para-aortic and bilateral iliac lymph node resection, spleen resection, appendectomy, peritoneal resection from both sides of diaphragm was performed. Final pathology revealed primary high grade serous ovarian adenocarcinoma. During the next month patient had retroperitoneal lymphocysts, febrile temperature, small bowel obstruction. There was a repeated surgical intervention after 10 and once again after 30 days from the primary surgery because of small bowel obstruction. After 2 years there was surgery with the intention to remove ureteral obstruction from right side caused by local recurrence. Overall patient has reached a survival period – 6 years, had 6 operations, periodically 17 chemotherapy courses with the last one 3 years ago. HE4 was more sensitive oncomarker in detecting disease relapse than CA-125. Now the patient has no symptoms suggesting relapse of disease, but she has depression signs and emotional difficulties in establishing relationships.
Conclusions: Radical surgery gives better 5 year survival rates, but also gives a variety of complications which should be monitored and solved. HE4 was a more sensitive biomarker in relapse of the disease. Although surviving ovarian cancer is a great success, it is challenging for maintaining mental health and quality of life for the patients.
Key words: ovarian cancer, young woman, radical surgery.

Rare case of solid vaginal metastasis five years after primary ovarian neuroendocrine tumor diagnosis

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Introduction: Neuroendocrine tumor is rare form of malignancy, especially in genital tract. Primary ovarian neuroendocrine tumours account for 0.1% of all ovarian cancers (Talerman, 1997). One third of ovarian NETs present with metastatic disease (Modlin *et al.*, 2003). Most common sites of metastasis in case of ovarian carcinoid are regional lymph nodes, liver, lungs and bones. There is no information in literature about primary ovarian neuroendocrine tumor metastasis in vagina. The rarity of this type of tumours limits evidence based research and guideline development about treatment so every knowledge about this topic is relevant.
Case report: A 46 year old woman presented with pain above the urinary bladder, especially increasing while urinating. Patient was diagnosed with bilateral primary ovarian neuroendocrine tumor 5 years ago. At that time surgery included total hysterectomy with bilateral salpingo oophorectomy, excision of pathological mass from left parametrial tissues, omentectomy and excision of enlarged paraaortic lymph nodes. Patient received chemotherapy with carboplatin/paclitaxel combination and octreotide for the last five years. After 5 years patient presented with pelvic discomfort and CT scan showed 6 cm pelvic mass. At the secondary cytoreductive surgery tumor from distal part of vaginat was excised through lower median laparotomy. Adjuvant chemotherapy was prescribed. At the final pathology metastasis of primary ovarian neuroendocrine tumour was revealed.

Conclusions: Primary ovarian neuroendocrine tumor metastasis in vagina is extremely rare. Women with ovarian NET overall have better prognosis than women with epithelial ovarian cancer. Combination of standard epithelial ovarian cancer therapy and octreotide use could be a good treatment approach in case of atypical ovarian carcinoid.
Key words: ovarian neuroendocrine tumor, vaginal metastasis, atypical carcinoid.

Acute pulmonary embolism by amniotic fluid – a rare complication of perinatal period which should not be forgotten. Case report

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Introduction: Amniotic fluid embolism (AFE) is a type of pulmonary embolism that occurs when amniotic fluid enters the maternal circulation during delivery or postpartum. The main symptoms are dyspnoea, cardiovascular collapse, disseminated intravascular coagulation, and even sudden cardiac death. The pathophysiological mechanism is not clearly elucidated. The AFE can be confirmed by excluding other diagnoses, especially pulmonary thromboembolism.
Case report: A case of 28-year old woman was admitted to obstetric ward during first stage of labour. She was at 37+5 weeks of gestation in the first and uncomplicated pregnancy. Due to a rapid deterioration of maternal condition with acute respiratory distress symptoms, an emergency caesarean delivery was performed. A foetus was born in critical condition having a low Apgar score. Moreover, the labour was complicated by uterine sub-atony. Disseminated intravascular coagulation with elevated D-dimer (6300 µg/l), low fibrinogen (< 50 mg/dl) and thrombocytopenia (67 × 10^9/l) was also occurred. The next day after the delivery, the patient was referred to the cardiac invasive care unit with acute pulmonary embolism suspected. An echocardiography revealed signs of right heart chambers overload due to acute pulmonary hypertension (RVSP 37 mmHg). However, CT angiography did not revealed thrombi in any pulmonary artery. In addition, abdominal CT showed haematoma in peritoneal cavity and pathological fluid within vaginal walls. The rapid administration of intravenous (IV) fluids and proper oxygenation were provided. She also received the IV bolus of unfractionated heparin and blood components transfusion. The patient was discharged a few days later after stabilization of medical condition and referred back to obstetric ward.
Conclusions: The AFE is largely unpredictable, unpreventable and typically catastrophic complication of pregnancy. It is important to recognize the clinical characteristics of AFE summarily. An immediate multidisciplinary response, especially the rapid correction of maternal hemodynamic instability and oxygenation, is essential to optimize patient outcome and minimize morbidity and mortality.
Key words: amniotic fluid embolism, DIC.

Selective intrauterine growth restriction in monochorionic-diamniotic twin pregnancy. Case report

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Introduction: Multiple gestations are associated with high risk of pregnancy complications and stillbirth. Selective intrauterine growth restriction (sIUGR) is one of them. In the majority of cases it is due to uneven placental share, which may be accompanied by vessel anastomoses, various in number and size. As a result one twin is growing significantly slower than the other. In utero demise of either of the twins may have tragic consequences for the other.
Case report: A report of a case of 34-year old woman in monochorionic-diamniotic twin pregnancy complicated by sIUGR is presented. The patient was referred to the hospital at 16 weeks of gestation due to the significant disproportion of intrauterine growth of fetuses. Initial ultrasound examination revealed sIUGR and oligohydramnios of the second fetus, not meeting the Quintero criteria of twin-to-twin transfusion syndrome. Next imaging tests also showed cardiomyopathy, pericardial effusion, abnormal blood flow and anhydramnios of the smaller fetus. There were no abnormalities in the properly growing co-twin. Moreover, there was a high risk of preeclampsia confirmed at 27th week of gestation in biochemical tests. At 28th week of gestation caesarean section was performed due to a very high risk of intrauterine demise of the second fetus. The first female fetus with 220 g of body weight was born in a critical condition and died 30 minutes after the delivery. The second female fetus was delivered in good general condition, weighing 1100 g. During her stay at neonatal intensive care unit the newborn required mechanical ventilation, antibiotics, blood transfusion. She was diagnosed with bronchopulmonary dysplasia and 3rd degree intraventicular haemorrhage. The baby was discharged after 74 days of hospitalization in good general condition, weighing 3090 g.
Conclusions: Multiple gestation carries an increased risk of adverse perinatal outcomes. Therefore, proper perinatal assessment based on ultrasonography is essential, especially in monochorionic pregnancies. In cases complicated by sIUGR the decision to deliver is especially difficult and requires wide clinical experience in order to increase the chances of survival for any of the two twins and to decrease the risk of complications resulting from prematurity.
Key words: sIUGR, monochorionic-diamniotic pregnancy.

A multidisciplinary approach to the fetus with tuberous sclerosis complex

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Introduction: Tuberous sclerosis complex is a genetically determined illness with various clinical presentations. Although it is an autosomal dominant disorder, as far as 2/3 of all cases are de novo mutations. Prenatal diagnosis is possible from imagining at the second trimester. Most common abnormalities detected in prenatal ultrasound are rhabdomyoma-type cardiac tumours. In this case report, we present a prenatally diagnosed fetus with a tuberous sclerosis complex.
Case report: A 29 year old patient was admitted to The Gynecological and Obstetric Hospital of the Medical University of Poznań with a pregnancy at 26 weeks of gestation as a follow-up visit. Pelvicalyceal system dilatation and multiple cardiac tumours were previously detected in the ultrasound. In the following examination, megacystis and the keyhole sign were found, suggesting posterior urethral valve. Furthermore, single supraventricular extrasystolias were discerned. During the 34th week of gestation, dextral hydronephrosis and two rhabdomyoma-type hyperechogenic cardiac tumours were diagnosed in the left and right ventricles. Due to the presence of the detected lesions, a suspicion of tuberous sclerosis was raised and further magnetic resonance imaging was ordered. Subependymal nodules in the lateral ventricles and right bilateral renal were found. The patient underwent labour in the referenced hospital at the 39th week of gestation. A 3520 g male newborn was born, scoring 10 and 10 on the Apgar score. Appropriate specialist care was ensured.
Conclusions: Incidence of tuberous sclerosis is estimated at 1/6000 to 1/10000 live births. Although renal abnormalities are common in tuberous sclerosis, they are rarely diagnosed prenatally. However, rhabdomyomas are the first indicators of the presence of the disease and can be detected from the 15th week of gestation. Newborn patients diagnosed with tuberous sclerosis need multispecialist care from the first day of their life. Using ultrasound and magnetic resonance imaging, early detection of lesions is possible and allows for adequate perinatal and antenatal care and surveillance testing.
Key words: tuberous sclerosis complex, posterior urethral valve, hydronephrosis, rhabdomyoma.

Challenges in pregnancy complicated by pre-eclampsia with accompanying fetal growth restriction

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Introduction: Pre-eclampsia is deemed one of the most serious complications of pregnancy. Despite the incessant progress of perinatal medicine and thorough understanding of pathomechanisms behind pre-eclampsia, this condition comprises 3-5% of complications of pregnancy and constitutes one of the main causes for pregnancy-related mortality in developed countries. This paper examines the case of pregnancy complicated by maternal pre-eclampsia and Fetal Growth Restriction (FGR), as well as fetal tetralogy of Fallot.
Case report: A 25 years old patient was admitted in 29+4 weeks of gestation due to pre-eclampsia. Throughout the course of hospitalization, the patient has been diagnosed with gestational diabetes, FGR (fetal biometry: 784 g in 30+1 weeks of gestation; < 1% percentile) and fetal tetralogy of Fallot. The diagnosis of the fetus has prompted the decision of conducting amniocentesis. The microarray analysis proved chromosome 22q11.2 deletion indicating DiGeorge Syndrome. The C-section has been conducted in 30+4 weeks of gestation due to late decelerations in CTG. The female neonate was born – body mass: 900 g; Apgar scores: 6 (1. min), 8 (3. min), 8 (5. min).
Conclusions: Due to pre-eclampsia, hypotensive treatment with methyldopa was initiated. Both gestational diabetes and pre-eclampsia constitute significant risk factor of FGR. Nevertheless, this case proves that it is crucial to take genetic causes (such as DiGeorge syndrome) into consideration, even if other risk factors of FGR are present. It is also important to consider preterm C-section if the risk of fetal harm outweighs possible complications related to preterm birth.
Key words: pre-eclampsia, FGR, gestational diabetes, tetralogy of Fallot, preterm labor.

Management of pregnancy of patient with Turner syndrome

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Introduction: Turner syndrome is a chromosomal aberration with an incidence of 1/2500 live-born females and a cause of up to 10% of miscarriages. Most common clinical symptoms of this condition are short height, infertility associated with gonadal dysgenesis, failure to progress through puberty and other symptoms from numerous systems. Even though women with mosaicism in karyotype are believed to have more viable oocytes, spontaneous pregnancy is an extreme rarity among affected patients. Regardless of the method of fertilization pregnancies of women with Turner syndrome are associated with a significantly increased risk of maternal and foetal morbidity.
Case report: In May 2018, 29 years-old patient was admitted to the Gynecological Endocrinology Clinic at three weeks of gestation. The patient was diagnosed with Turner syndrome two years earlier, as previously there were no clinical features indicating this abnormality except short height and secondary amenorrhea. In vitro fertilization with oocyte donation was chosen as a method of childbearing because of patients premature ovarian insufficiency caused by 46,XX/45,X mosaicism. Despite high likelihood of success using this method, pregnancy of patient with Turner syndrome was high risk and needed

comprehensive health control. As there is 1-2% mortality in Turner syndrome pregnant women, follow-up visits were continued every month during pregnancy. Control ultrasound and cardiological examination indicated low risk of fetal defects (FHR 163/min, NT 1.4 mm, NB+) and also low risk of aortic dissection of the patient. As patients' blood type is BRh–, anty-Rh immunoglobulin was administered in 28 hbd. In 39 hbd caesarean section was performed and a healthy son was born. The patient and the newborn were discharged from the hospital with detailed indications for control visits and tests.
Conclusions: Assisted reproductive technologies are effective methods available to enable women with Turner syndrome to get pregnant. The number of patients using these solutions is growing, so it is crucial to remember that comprehensive health control is necessary due to significantly increased both maternal and foetal mortality risk.
Key words: high risk pregnancy, Turner syndrome, in vitro fertilization with oocyte donation.

Successful pregnancy in a rare variation of Herlyn-Werner-Wunderlich triad (OHVIRA syndrome)

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Introduction: The Herlyn-Werner-Wunderlich syndrome (HWWS), also known as OHVIRA (obstructed hemivagina/hemicervix and ipsilateral renal anomaly) is a congenital malformation, described as a triad of symptoms: didelphys uterus, low genital obstruction and unilateral renal anomaly. Pregnancies in women with this syndrome are categorized as high-risk due to the size and shape of the uteri and cervices as well as the reduced kidney function. Expectant mothers are often managed with cervical sutures and C-sections to prevent fetal distress during labour.
Case report: The pregnant woman was admitted in the 38 + 1 weeks of GII PII to the Department of Obstetrics and Perinatology UH in Cracow in order to prepare for the termination of biologically mature pregnancy due to an orthopedic indications. The patient was previously diagnosed for HWWS syndrome – hemivagina, hemicervix and agenesis of the left kidney. Medical history: condition after obstructive surgery of the vaginal septum, diabetes, asthma, condition after cesarean section seven years earlier, indication: condition after the operation of uterine septum; laparotomy and laparoscopy twelve years ealier. On admission the ultrasound examination revealed one fetus, alive, in the cephalic longitudinal position. Cardiotocogram showed foetal heart rate (FHR) 145/min. No delivery state was found. The vaginal part of the cervix was shortened, the cervical os was closed. No pathological discharge from the birth canal. Amniotic sack preserved. The patient feels the movements of the fetus. On the fourth day of hospitalization, a cesarean section was performed under spinal anesthesia. The procedure was performed without any complications. The patient was discharged on the third day after surgery, in a good general condition without any complaints. In the pre-discharge examination: postoperative wound was healing properly, endometrium and vaginal part during the period of normal involution. Parametrium and paracolpium impalpable. Physiological serous-bloody faeces.
Conclusions: Early diagnosis and treatment of the HWWS are necessary to preserve sexual and reproductive abilities. OHVIRA, though it is unusual and complex condition, allows successful pregnancies.
Key words: Herlyn-Werner-Wunderlich triad, OHVIRA syndrome, succesful pregnancy, cesarean section.

Orthopaedics, Sports Medicine and Case Report

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List of papers:

Case reports

Clinical and radiological long term evaluation of unstable thoracolumbar and lumbar type A fractures treated by percutaneous surgery after implant removal

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Introduction: Implant removal represents almost one third of all elective surgeries in orthopedics. There is no consensus regarding the time and need to remove the implants after vertebral fractures consolidation.
Aim of the study: To assess the clinical and radiological effects of implant removal in patients with vertebral type A fracture who underwent a percutaneous intervention.
Material and methods: We evaluated 31 patients (mean age of 38.2 ± 7.5 years) with thoracolumbar vertebral fracture (T11-L5) who underwent implant removal surgery after 24 months of fracture first surgery by a percutaneous approach. Inclusion criteria focused on patients' preferences. The radiological parameters included fracture angle, initial sagittal index, compression percentage, degree displacement, deformation angle. The clinical variables included Visual Analog Scale and Oswestry Disability index.
Results: There was no significant correction loss after removal surgery (before surgery and after 24 months): Fracture angle (16.8 ± 0.5 vs. 17.1 ± 0.5; $p > 0.05$), initial sagittal index (12.5 ± 0.5 vs. 12.7 ± 0.5; $p > 0.05$), kyphotic deformity (17.5 ± 0.6 vs. 17.8 ± 0.7; $p > 0.05$), compression percentage (35.6 ± 0.8 vs. 36.0 ± 0.7; $p > 0.05$), degree displacement (4.4 ± 0.4 vs. 4.5 ± 0.3; $p > 0.05$) and deformation angle (23.0 ± 0.7 vs. 23.1 ± 0.7; $p > 0.05$). Patients who presented symptoms before the surgery showed better Visual Analog Scale (1.2 ± 0.6 pre vs. 0.6 ± 0.3 post, $p < 0.05$) and Oswestry Disability Index (20.1 ± 6.8 pre vs. 15.7 ± 0.5, $p < 0.05$). No complications were reported.
Conclusions: Routine implant removal in patients undergoing a percutaneous approach to vertebral type A fracture is a safe technique and is associated with good clinical results without loss of radiological correction.
Key words: implant removal, vertebral fracture, percutaneous fixation, clinical, radiological, thoracolumbar unestable fractures.

Orthopedic treatment and early weight-bearing for bimalleolar ankle fractures in elderly patients: quality of life and complications

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Introduction: Non-operative treatment of Weber's type B ankle fractures is essential in elderly patients. However, there is controversy in the post-reduction management of the fracture between the use of early weight-bearing or traditional treatment and non-weight-bearing for 6-8 weeks. There is limited evidence available regarding which rehabilitation regimen should be included.
Aim of the study: This study aimed to compare the quality of life and the number of complications between the two types of intervention (weight-bearing and non-weight-bearing).
Material and methods: Prospective cohort study. The quality of life was analyzed through the SF-12 and the Barthel Index at 6 weeks, one year and two years. The mean age was 83 ± 3 years in the weight-bearing group and 82 ± 3 in the non-weight-bearing group. In addition, the associated complications and costs were analyzed.
Results: A total of 70 patients were assigned in two groups: a control group of 37 patients (nonweight-bearing) and an experimental group of 33 patients (weight-bearing). A significant difference was observed in favor of early weight-bearing in SF-12 both, in the short and long terms (52.9 ± 5.3 vs. 64.9 ± 4.6; $p < 0.001$ and 69.8 ± 4.1 vs. 81.0 ± 3.6; $p < 0.001$). Significant differences were also observed in favor of early loading with respect to the Barthel Index (54.3 ± 4.9 vs. 64.2 ± 3.9; $p < 0.001$ and 70.6 ± 4.2 vs. 80.4 ± 3.0; $p < 0.001$). There were no significant differences in the complication rate between the two groups.
Conclusions: Early weight-bearing improves the quality of life and functionality in elderly patients with Weber type B fracture without increasing complications.
Key words: ankle fracture, bimalleolar fracture, weight-bearing, elderly patients, quality of life, complications.

Efficacy of pamidronic acid in treatment of secondary osteoporosis in children. A retrospective, single-center, open-label study

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Introduction: Children suffering from chronic illnesses are at elevated risk for bone strength reduction and subsequent fractures, which in secondary osteoporosis is provoked either by the impact of the underlying condition on bone structure development or caused by osteotoxic effect of medications

such as glucocorticoids. While early stages of osteoporosis can be spontaneously recovered by eliminating risk factors in pediatric patients, bisphosphonates should be considered in more substantial cases.
Aim of the study: To examine the efficacy of bisphosphonate therapy in treatment and prevention of bone fractures in secondary osteoporosis in children.
Material and methods: 48 children, 21 girls and 27 boys, from 1 up to 17 years of age, all diagnosed with secondary osteoporosis have been examined retrospectively (2012-2019). 11 patients are still continuing pamidronic acid remedy, 1 patient has been withdrawn nad 36 patients have completed the therapy. All patients were administered intravenously with weight-based dosages of pamidronic acid every 2.5-3 months. Authors examined number of fraction events before, during and after treatment along with initial and final bone density measured in densitometry, which resembled efficacy of the treatment.
Results: 46 patients presented different types of fractures in the first place, but only 3 of them ruptured a bone through the duration of a drug administration period. None of patients have been reported to fracture a bone afterwards. Authors have noticed a significant decrease in mean value of *Z*-Score from ≈ –3.6 ± 0.52 to –1.7 ± 0.9.
Conclusions: Bisphosphonians have recently gained recognition as one of the most effective first line treatment of osteoporosis in adults. However, there is still no clear evidence considering efficacy and safety of bisphosphonians in treatment of secondary osteoporosis among children. Although presented trial supports the idea of proliferating the use of pamidronic acid I.V. in order to prevent from further fractioning, further trials are warrant.
Key words: children, secondary osteporosis, bisphosphonate, pamidronate.

Diagnosis algorithm for carpal tunnel syndrome

Anna Bessarabova, Anna Lisenkova

Tutors: Professor Andrei Fominykh, Immanuel Kant Baltic Federal University; Trauma Orthopaedist, MD, Kaliningrad Regional Clinical Hospital, Russia;
Nikolay Kotov, ultrasound specialist, Head of the Diagnostic Department of the Clinical and Diagnostic Center, Immanuel Kant Baltic Federal University, Russia

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Introduction: Carpal canal syndrome (CCM) is a problem in all ages and of many professions. It is often inadequately diagnosed and treated, and it consequences in disability.
Aim of the study: Current clinical guidelines for suspected CCM suggest anamnesis, clinical examination, instrumental methods (electroneuromyography (ENMG), ultrasound, CT scan, magnetic resonance imaging (MRI). However in realty either ENMG or ultrasound are used. The purpose of the work is to propose an effective diagnostic algorithm for CCM.
Material and methods: On the basis of the Immanuel Kant Baltic Federal University Clinical and Diagnostic Center, GBUZ "Regional Clinical Hospital of the Kaliningrad Region" in the Department of Traumatology and Orthopedics 48 patients were examined within 2016-2020. The CCM diagnosis was confirmed with 32 patients, 8 with cubital canal syndrome, 2 with round pronator, 2 with osteoarthritis of wrist joints, 1 with cervical radiculopathy, 3 with median nerve traumas. Ultrasound scan and ENMG are the main research methods. Two devices were used Toshiba Aplio 500 Linear, sensor frequency 12-18 MHz, and Acuson S2000 with 18 L6 HD sensor. We also used Nicolet Wiking Quest device. The age of the patients ranged 20 to 80, including 32 women and 16 men.
Results: Each passed both ultrasound and ENMG. The results showed blood flow disturbance to be the key symptom to focus on when assessing the state of the median nerve in CCM. An open nerve decompression was performed applying a microsurgical technique in combination with neurolysis or endoneurolysis. Final ultrasound and ENMG were compared preoperative ones to evaluate the effectiveness of treatment and rehabilitation after surgical results.
Conclusions: Based on the findings, a diagnostic standard of 2 stages is proposed for patients with suspected CCM – anamnesis with a Boston examination and clinical examination (neurological examination, specific diagnostic tests) and comprehensive diagnosis of ultrasound and ENMG. The proposed diagnostic algorithm allows accurate definition of surgical intervention indicators at early stages of the disease, acceleration of CCM patients rehabilitation and improvement of quality of life.
Key words: surgical decompression, ultrasound, electroneuromyography.

Characteristics of adult patients undergoing primary total hip or knee arthroplasty in Poland

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Introduction: Alloplasty procedures are one of the most frequently performed orthopedic surgeries in Poland. They have a significant impact on the quality of patients life. However, data on patients undergoing surgery and their needs for pre-hospital perioperative care in Poland are still insufficient.
Aim of the study: The aim of the study was to characterize the population of patients undergoing total hip or knee arthroplasty in Poland, which is intended as a reference for further research.
Material and methods: The study was conducted using the national database of the National Health Fund, which contained the data reported from polish hospitals performing total hip (HPRO) and knee (KPRO) arthroplasties in 2017-2018. Pearson's *t*-test, and Fisher's exact test were used for statistical analysis with *p*-value significance < 0.05.

Results: In our study, we included 78388 patients, of which 49394 (63.0%) were women and 28994 (37.0%) were men. The vast majority (66.6%) underwent a hip replacement with an average age of 68.43 years (SD 11.9). For patients undergoing knee surgery, the average age was 68.50 years (SD 8.2). The majority (79.9%) were admitted as planned patients and 20% of patients as the urgent. The main reason for hospitalization was joint degeneration (total – 84.2%, HPRO – 76.5%, and KPRO – 99.5%), then trauma for 15.1% patients ($p < 0.001$). As many as 81.9% of patients took drugs from 4 or fewer groups, which was the accepted limit above which the multimorbidity was diagnosed: exactly 84.1% ($n = 43889$) for the HPRO and 77.8% ($n = 20338$) for the KPRO ($p < 0.001$). Only 0.5% of patients had flu vaccination before the procedure while 54.9% had indications. Similarly, 5.1% had HBV vaccination before surgery. Only 5.2% was rehabilitated before surgery.
Conclusions: In the Polish population, unfortunately, despite the indications, the vast majority of patients are poorly prepared for surgery by minimal flu vaccination levels and low physical activity in the form of systematic rehabilitation. Due to the increasing age of patients' morbidity, consideration should be given to implementing guidelines to prepare patients for orthopedic procedures for the prevention of after surgery complications.
Key words: arthroplasty, knee, hip, adult, orthopedics, Polish population.

Case reports

Primary septic hip joint arthritis-never ending story

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Introduction: Pathogenesis of acute septic arthritis is multifactorial, depending on hosts immune reaction and infection agent's trait. Anamnesis of septic arthritis is high risk for periprosthetic infection after hip arthroplasty.
Case report: Female, 56 years old, primary diagnosis: left femoral head avascular necrosis (AVN), secondary osteoarthritis (OA). Comorbidities: Cancer colli uteri, status post hysterectomy, radiotherapy (2013). Lymphostasis in lower extremities. Recurrent urinary tract infection (UTI). Recurrent erysipelas on both thighs, external genitalia area. Anamnesis: progressive pain, movement restriction in the left hip joint for over a year. Laboratory values were normal. Magnetic resonance imaging (MRI) 19.12.2018 – left hip OA, bursitis. 19.02.19. Skeletal scintigraphy – left femoral head AVN, OA. 03.03.19. Sudden increase of pain, fever 38°C. 05.03.19.Admission in hospital, C-reactive protein (CRP) 134.8 mg/l. Hip joint aspirate – cytology 87% neutrophil leukocytes. Microbiology result – *Corynebacterium* spp. 06.03.2019. Emergency surgery – left hip joint arthrotomy, femoral head resection, temporary endoprosthesis implantation, cement with Gentamycin and Vancomycin. 07.03.19. Postoperative period is good, i/v antibiotic therapy – Sol. Cefazolini 1 g × 4 per day. Laboratory findings – CRP 277.8 mg/l decreases to 92.6 mg/l. Patient is discharged with oral antibiotic therapy, Tab. Ciprofloxacini 500 mg 2× for 4 weeks. CRP drops till normal range. 3 months later – erysipelas in perineum area, UTI (*E. coli*), antibiotic therapy by primary physician. 16.12.19. Complaints of pain, periodically febrile temperature. CRP 13.4 mg/l. 22.01.20. Revision surgery with temporary cemented endoprosthesis. Microbiology – Haemolytic Streptococci. Antibiotic therapy – Tab. Amoxiclav 500 mg/125 mg 3× for 2 months.
Conclusions: Patient had multiple risk factors for septic arthritis, resulting in immunocompromised state, various antibiotics for other diseases, making it harder to diagnose periprosthetic infection. Multispeciality team – orthopaedic surgeon, infectious disease doctor, primary care physician, physiotherapist should be involved.
Key words: septic arthritis.

A case of instable patellofemoral joint with cartilage damage

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Introduction: Patellofemoral instability is relatively common and has multifactorial aetiology-patella hypermobility, generalised mobility, muscle weaknesses, trochlea dysplasia, patella alta, trochlear groove-tibial tubercle (TT-TG) distance, Q angle etc. In order to treat joint instability physician should evaluate radiological factors like patella height, patella tilt, TT-TG and trochlear morphology, while clinically examine patella height, quadriceps function, hamstring tightness, trochlear depth in flexion.
Case report: Female, 30 years old, right patellofemoral joint instability, medial patellofemoral ligament rupture (MPFL), chondral lesion of patella (Grade 4). Anamnesis. Patient sustained trauma on her right patellofemoral joint-patella dislocation. At first the patient was managed nonoperatively with functional rehabilitation. After conservative treatment patient still complained about recurrent patella dislocation, anterior knee pain and instability of the joint. Magnetic resonance imaging revealed trochlea dysplasia type C, shallow trochlear groove, TT-TG distance > 20 mm, patella cartilage damage 2.5 × 3 cm, synovitis. Free chondral particles. Patient underwent surgery. Right knee joint MPFL reconstruction using gracilis tendon and Milagro anchor screw, tibial tuberosity antero-medialisation osteotomy to reduce pressure in the joint and on the cartilage defect, patella cartilage reconstruction with ChondroFiller. Patient underwent upper thigh muscle strengthening rehabilitation. After 6 months patient had metal construction evacuation from tibia and right knee diagnostic arthroscopy. Post-operative was without complications. One year later patient regained full range of motion and stable patellofemoral joint.
Conclusions: Patellofemoral instability can be treated nonoperatively in the beginning, but studies have shown that most of the patient have re-dislocation and it will be managed operatively. Treatment is complicated because patients have multiple factors that contribute to it. Therefore, physicians must do multiple surgical procedures on the joint to reach satisfactory outcome.
Key words: patellofemoral instability.

Case study: non-ordinary hip replacement surgery

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Introduction: Female patient age 69 appeared at emergency department two-weeks after falling. Radiological and CT scan results indicated right distal radius fracture and left hip prosthesis loosening. A soft tissue mass was detected extending through the pelvis into the lower abdomen. Patient interview revealed hip replacement had occurred in 2008 and deterioration of cognitive function noted over the previous year.
Case report: Right distal radius fracture required screws and plate to maintain position. A biopsy of left hip joint was completed. Histological exam produced no malignancy findings. Hip joint revision surgery undertaken few days later after negative biopsy results. Surgery revealed complete loss of abductor muscle and extensive soft tissue damage. Thorough debridement of the site was completed. Substantial bone loss required prosthesis removal. Cause of soft tissue and bone loss was consistent with metal-on-metal prosthesis. Pelvis defect matched Paprosky 3B with pelvis discontinuity. Reconstruction carried out with TM Shell, dual mobility cup and uncemented femoral stem. Patient cobalt and chrome serum levels found within normal reference range. Two weeks post-surgery patient discharged from hospital. One-month later patient returned to hospital with repetitive hip luxation. Repetitive luxation required additional revision surgeries resulting in infection, prosthesis removal and soft tissue reconstruction with muscle flap were performed.
Conclusions: Numerous prior research results show that metal-on-metal prosthesis result in bone and soft tissue damaged and affect cognitive functions. Long term risk of complications caused by metal-on-metal prosthesis hip replacement surgeries is considerably higher than with other type of endoprosthesis. Our case shows that damage can be extensive resulting in long treatment and loss of quality life. Patients' cognitive function did not improve after removal of endoprosthesis and requires continued monitoring.
Key words: hip-replacement, hip-revision, complications, metal-on-metal, orthopaedics.

Giant traumatic neuroma clinical case

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Introduction: Neuromas are rare benign nerve tumors, most often of traumatic origin or sometimes it occurs after surgical interference. We present the case of a 41-year-old female patient having a giant neuroma of the median nerve on her right hand.
Case report: Patient M., 41, apply to the hospital with complaints on numb feeling in 1st, 2nd, 3rd and half of 4th fingers on her right hand and gigantism of the 4th finger. Anamnesis states that six months before she was operated in one of hospitals on the carpal tunnel syndrome. On examination a normotrophic scar in the distal third of the right forearm closer to the ulnar side, hypotrophy of tenor, hyposthesia in the innervation zone of the median nerve were detected. Tinnel symptom was positive. The fourth finger was severely swelled and movement was restricted. A preliminary diagnosis was carpal tunnel syndrome, gigantism of fourth finger. During the operation, median nerve hyperplasia is detected at the level of the distal third, while the diameter is not exceeded by 6 times compared to healthy limbs. In addition a torsion of nerves formed at the level of nerve transition into the common finger branches shaped as a bulb 1.5 cm in diameter. Endoneurolysis was performed, the fascicle was transected (there were 16 nerve pieces), a club-shaped

formation was transected up to healthy tissues. Perineural suture of each bundle was done separately using a proline thread 9/0. The fourth finger was formed into a residual limb of the proximal phalanx at the request of the patient. Sensation returned in 6 months. The patient was pleased with the result of the operation.
Conclusions: We believe that median nerve hyperplasia is a satellite of the gigantism of one or more fingers. Monitoring is underway.
Key words: neuroma, wrist, median nerve.

Thoracic outlet syndrome in an excessively trained young olympic athlete – case report

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Introduction: Thoracic outlet syndrome is a condition where a neurovascular bundle is compressed in the passageway from lower neck to the armpit. It can vary both in types of compressed structures, and also can bring different results, depending on the level of compression. Due to the fact, that there is not a single specific standardized confirmatory test, and the onset may be sudden, the diagnosis is often difficult.
Case report: This case report describes a history of a 19-year old patient, a Polish youth national team member in cross-country skiing, with highly above average physical performance. During the winter season due to over excessive physical exercises, left subclavian venous thrombosis occurred to him unallowing his further trainings. After undergoing thrombectomy he came back to the trainings. However after several months, he presented with burning sensations of unknown reason which has not been correctly diagnosed until his visit to Switzerland where he was diagnosed with TOS. The suggested open thorax surgery operation met with higher risks of his future outcomes and long expected rehabilitation. Therefore he decided to quit his olympic career.
Conclusions: There are many factors that may contribute to the development of rare medical conditions such as the one presented in this particular case report, which can possibly prevent athletes from their future outcomes. Therefore it is essential not to undergo over excessive trainings causing uncontrolled muscle growth, not being taken care of professionals. Every athlete, whether olympic or not, should be accurately checked before deciding to extend the workout scheldue in order to prevent the possible negative influence which training may bring to his or her health.
Key words: thoracic outlet syndrome, subclavian vein, thrombosis, compression, excessive physical exercises, diagnosis.

Educational Session – Doctors Africa

Coordinators:
Anna Tabor

List of papers:

Albinism in Africa – medical and social issues

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Albinism is a genetically determined condition characterized by deficit in the biosynthesis of melanin, a pigment that provides the colour of skin, eyes and hair and protects cells from harmful UVB radiation damage. The prevalence rate of albinism is reported to be 1 in 20,000 in Europe, while in sub-Saharan Africa, it is much higher – estimated at 1 in 2000-5000. Almost 90% of people with the disease die before the age of 40 there. Lack of melanin results in high risk of sun damages, such as actinic keratosis, squamous and basal cell carcinoma or vision problems – photophobia, amblyopia and nystagmus. Because the cure for albinism does not exist, there is a need for constant care and protection of the eyesight and skin.

The life-long management includes sun avoidance, everyday use of sunscreens and protective clothing. Regular skin checks are very important as well, to diagnose precancerous, curable lesions. Studies show that sun protection in African albinos is highly inadequate. Less than half of them use sunscreen and only 12% have SPF15 cream sponsored by a government. Lack of dermatologists and oculists often preclude from regular check-ups.

Despite many medical problems, African albinos have to deal with stigmatisation and discrimination caused by superstitions and beliefs in the magical powers of their body parts. They are thought to bring health, fortune and luck. Witch doctors purchase albinotic body parts for thousands of dollars to sell it as potions. In some African countries such as Tanzania or Malawi many violent assaults, grave robberies, mutilation, or even murders of people with albinism have been reported. Governments and organizations do their best to prevent attacks on albinos.

Although many organizations have been set up to fight against albino hunters, persecution of people with albinism is still a serious problem among Sub-Saharan African communities. There is a significant need to improve doctors' accessibility as well as to dispel the myths and raise awareness about the etiology, management and medical consequences of this life-threatening disease.

Key words: albinism, Africa, Doctors Africa.

Political situation in Tanzania and Uganda

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The political situation in Uganda and Tanzania has changed dramatically over the past decade. Using data from "Human Rights Watch" we may observe how multi-party politics has enhanced dissatisfaction of a young, underemployed population.

Whereas once predominantly under a single party hegemony, Tanzania today is defined by a plurality of political parties. Principal issues confronting the country's new government include: strengthening political opposition, destabilization of the union with Zanzibar and unique geopolitical position between East and southern Africa. Tanzania's president Dr. John Pombe Magufuli has already made his mark as an economic leader committed to battling waste in the public sector and punishing poor performance in delivering public services. Since his election, Tanzania has witnessed a marked decline in respect for free expression, association and assembly. Attacks on rights by authorities are increasingly accompanied by the implementation of restrictive laws and the harassment and arrest of opposition members, journalists and critics. Health services are mostly supplied by national government financing, with other tax-based funds and additional earnings. Prevention and health promotion concerning malaria, HIV/AIDS are the biggest health service needs.

Uganda has remodeled itself from a country with a troubled history to one of relative prosperity and stability. President Yoweri Museveni's growing authoritarianism and the country's weak institutions are increasing Uganda's challenges. Conflict risks at the regional level are growing due to uncertain political succession, youth growth, economic stagnation and an influx of refugees from South Sudan. While the country has won praise for its vigorous campaign against HIV/AIDS it has also drawn international attention for its hardening position against the LGBT community.

This study shows Tanzania and Uganda need help from well-developed countries not only in a medical way but also from a political perspective mostly considering its neglecting of human rights.

Key words: Tanzania, Uganda, political situation, human rights, low-income countries, Doctors Africa.

Climate crisis

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Climate crisis is one of the most urging issues of our time. This term itself is used to illustrate climate change (which, according to UNFCCC, is a change of climate which is attributed directly or indirectly to human activity (...) and which is in addition to natural climate variability) and its consequences.

Scientists from all over the world agree that our planet is warming up. Nine of the 10 warmest years on record have occurred since 2005. Approximately 1.0°C of global warming above pre-industrial levels derives from human activities. If it continues to rise at the current scale, it's likely to reach 1.5°C between 2030 and 2052. This phenomenon is going to affect life on earth in various different ways, so it's crucial to consider possible scenarios. Raised temperatures are anticipated to affect the water cycle, from intensified and/or more frequent precipitations in some regions to more severe and extreme droughts in others. Sea level rise will increase flooding, saltwater intrusion, and devastation of infrastructure. Climate change's impact on wildlife and plant life will irreversibly alter biodiversity causing a transformation of ecosystems from one type to another. Global warming will also impose great influence on human health, primarily negative. WHO's calculations show that it is expected to cause around 250.000 additional deaths per year between 2030 and 2050. Most of them (95.000) will occur due to childhood undernutrition. Another 60.000 will assumably be caused by malaria,

which nowadays kills approximately 400.000 people per year. Poverty and disadvantage are anticipated to increase in some populations as global warming continues. Many regions will experience decreased food availability and freshwater supply.
Although people already experience climate crisis's impact, there is still a wide variety of adaptation options that can reduce the hazards of warming up. Unfortunately, it is unlikely to stop global warming per se, but it is possible to fight its consequences and slow this process enough to keep the planet inhabitable.
Key words: global warming, climate change, climate crisis, Doctors Africa.

HIV and pregnancy

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There are approximately 18.8 million HIV-positive women around the world. Every year 1.4 million of these women become pregnant, 90% of whom live in sub-Saharan Africa. Although increasing widespread antiretroviral therapy in pregnancy in low- and middle-income countries resulted in a 47% reduction of new HIV infections in the pediatric population, annually 100 000 children die from AIDS-related causes.
The main aim of the research was to gather information on the subject of transmission, screening, prevention, and treatment methods of HIV during pregnancy and breastfeeding and to point out the differences between abovementioned in high-, middle- and low-income countries. Data was collected by researching online databases including Pubmed, World Health Organization reports, Unaids, and others.
Family planning, antiretroviral therapy, undetectable viral load, and formula feeding are the factors that lead to reduction of mother-to-child transmission (MTCT) from 45% (among women without any treatment during pregnancy and breastfeeding) to 0.2% (among women who received ART before conception and fed their children with formula). The difficulties are more multifaceted than limited access to ART. The important challenges are also the lack of health and sex education, late antenatal care, shortage of screening, cultural and religious factors, low treatment adherence-which might be associated with adverse treatment effects like mitochondrial toxicity, dermatologic hypersensitivity reactions from a mild morbilliform rash to Stevens-Johnson syndrome, and lipodystrophy syndrome. So the succeeding HIV treatment target should include the continuation of 'Treat All' policy, early prenatal care, improvement of education, and psychological support. In high-income countries, there is an estimated number of 1-2% MTCT, in low-income countries it is 18-42%, so there is room for further improvement in both of these groups.
Key words: HIV, AIDS, pregnancy, prophylaxis, treatment, mother-to-child transmission, MTCT, antiretroviral therapy, ART, low-income countries, high-income countries, Doctors Africa.

Polycystic ovaries and associated clinical and biochemical features

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Polycystic ovary syndrome (PCOS) is the most common endocrinopathy of women in reproductive age. PCOS apply to 5-15% of mentioned women and is characterized by menstrual disturbances, hyperandrogenism, and infertility.
The diagnosis of PCOS is based on hyperandrogenism and ovulation disturbances but also in the exclusion of other factors of hyperandrogenism as the part of the adrenal or pituitary gland. The clinical picture of ultrasounds in the diagnosis of the disease is also important. In addition, biochemical tests can be used to determine the levels of androstenedione, DHEAS, 17-OH-progesterone, gonadotropins FSH and LH, estrogens, prolactin, insulin and SHBG. The etiology of PCOS is not entirely clear. Three pathophysiological models of the syndrome are:

- gonadotropic – LH production disorders, FSH biological function;
- ovarian – disorders of androgen production and metabolism in the ovary;
- insulin-dependent – disorders of insulin secretion and activity.

The most common clinical symptoms are menstrual cycle disturbances, hyperandrogenemia, and hyperandrogenism, polycystic ovarian morphology, overweight or obesity, insulin resistance, pre-diabetes, infertility and even type 2 diabetes or endometrial cancer may occur. PCOS treatment includes a change in the patient's lifestyle, pharmacotherapy using: hormonal drugs, metmorphine, anti-androgen drugs (for women that not planning pregnancy). Treatment of infertility and in the case of ineffective pharmacotherapy is done laparoscopically.
According to the study about polycystic ovaries syndrome in Tanzania, PCOS are common among women with infertility, however are not necessarily associated with PCOS. Doctors should investigate their clients for PCOS and offer appropriate treatment.
PCOS mostly applies to women in reproductive age but more often among teenagers. It is important to prevent and quickly diagnose patients to reduce the unpleasant consequences of the disease in the future.
Key words: polycystic ovary syndrome, ovarian hyperandrogenism, diabetes type 2, metmorphine, menstrual disturbances, vitamin D supplementation, infertility, Tanzania, Doctors Africa.

Typhoid fever

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Typhoid fever is a generalized infection caused by an enteric bacterium – *Salmonella typhi*. It can be transmitted by the fecal-oral route, as well as direct contact with an exudation. The risk of exposure increases in population lacking adequate sanitary and safe drinking water. The estimated number of cases oscillates between 11 to 21 million people

worldwide each year, with deaths around 160 000. Regions with higher rates are low and medium-income countries (LMICs), such as in South Asia, Africa and South America.
The incubation period is typically 14 days. The clinical course can be divided into four stages, each lasting around 7 days. In the first phase, a prolonged high fever up to 40°C, headache, general fatigue and constipation predominates. In the second phase, additionally occurs a nonproductive cough and bradycardia with hypotension. Gastrointestinal symptoms include abdominal pain, hepatosplenomegaly and diarrhea. A rose-colored maculopapular rash on the trunk is frequently present. During the third week, mental confusion and oliguria arise as infection fully exacerbates. Complications occur in 10-15% of hospitalized patients, and life-threatening ones can be an internal hemorrhage or intestinal perforation. A slow convalescence begins in the fourth phase. Fatality in the adequately treated patients is 1-4%, however, it can rise to 20% if not hospitalized.
The confirmation of the diagnosis can be obtained by hemoculture. Nowadays, fluoroquinolones are used in treatment. In regions with reduced susceptibility to those, III generation cephalosporines or azithromycin is preferred. Additionally to that, symptomatic treatment is crucial.
As of it today, typhoid fever is one of the most common and dangerous Salmonella infections, prevention is crucial. It includes health education, water sanitation, proper hygiene and vaccinations. Currently there are 3 types of vaccines: conjugated (TCV), unconjugated polysaccharide (Vi) and live attenuated (Ty21a). Travelers should also implement safety precautions on drinking water, food consumption and hygienic procedures to reduce the risk of infection.
Key words: typhoid fever, *Salmonella*, travel medicine, Doctors Africa.

Infertility treatment

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Infertility, defined as a failure to achieve pregnancy within 12 months of unprotected sexual intercourse in women younger than 35 years or within 6 months in women older than 35 years. According to estimates, the problem affects up to 10-16% of people of childbearing age. Poland is struggling with it about a million couples. In Africa infertility ranges from 3% to 23%.
Diagnosis of infertility include a review of the medical history, physical examination, and additional tests. The major causes of female infertility are anovulation, tubal defect, endometriosis, and unexplained infertility. Medications used for ovulation induction include agents that increase FSH through alteration of negative feedback (Clomiphene citrate), gonadotropins, and pulsatile GnRH. Laparoscopy with tubal lavage often with a hysteroscopy is recommended to treated tubal disease. Conservative surgery can be used to treat endometriosis. Male infertility could be divided into primary hypogonadism, secondary hypogonadism, disordered sperm transport and unknown. Secondary hypogonadism is treatment with gonadotropins of pulsatile gonadotropin-releasing hormone (GnRH). Patients with primary testicular failure and disorders of sperm transport could be treated of in vitro fertilization (IVF), which together with intracytoplasmic sperm injection (ICSI) is classified as assisted reproductive technologies (ARTs). The major underlying cause for the high levels of infertility in Africa appears to be sexually transmissible diseases (STDs) manifested as obstructive azoospermia in man and tubal occlusion, pelvic adhesions or pregnancy complications in the woman. Infertility therapy should be a focus on treating and preventing infection.
There are many different reasons why a couple might have a problem with conception. Infertility can be treated with medicine, surgery, laparoscopy, hysteroscopy. Africa has a pattern of infertility, including sexually transmitted diseases (STDs) come to the fore.
Key words: Doctors Africa, infertility treatment, sexually transmissible diseases (STDs).

Religious diversity in Africa

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Religious traditions in Africa are very differentiated. Nowadays, populations and individuals are mostly adherents of Christianity, Islam, and traditional religions.
Local beliefs have a huge impact on practicing Islam and Christianity in Africa. African traditional religions were first on the continent and can be traced back to the very beginning of the emergence of African peoples. It is difficult to estimate the number of followers, but in countries such as Burkina Faso, Zimbabwe or Togo they are 50% of the population. History of Christianity in Africa began in the first century and the origins of Islam were in the seventh century. Christianity is now one of the most widely practiced religions in Africa, especially in the south. One-third of the population of Africa are Muslims. It is the dominant religion in North Africa, due to the cultural connection of this area with the Arab zone. In the central Africa influences of these two religions mix. For example, 84 percent of the population of Uganda is Christian while about 14 percent of the population adhered to Islam. In the neighboring country – Tanzania 61% of people are Christian and 35% define themselves as Muslims, but Islam is the most prominent religion on the semi-autonomous Zanzibar where was brought through Arab traders from the southern part of the Arabic peninsula.
To summarize, Africa is divided into two main zones: the population of the north is Islamic and the population of the south is Christian. In Christian and Islamic communities religious beliefs are sometimes characterized by syncretism with the beliefs and practices of traditional religions.
Key words: religion, Africa, traditions, beliefs, Islam, Christianity, history, Uganda, Tanzania, Doctors Africa.

Tuberculosis

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Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* complex – *M. tuberculosis*,

M. bovis and *M. africanum*. Pulmonary TB is the most contagious type. In 2018, there were an estimated about 10 million new TB cases worldwide. 66% of new cases of TB are diagnosed in eight countries, including Africa. TB is the top infectious killer worldwide. People infected with HIV account for 9% of people with tuberculosis.

The symptoms of tuberculosis include: coughing (up blood), chest pain, fever, loss of appetite, weight loss, night sweats. Most patients have low symptoms and in many cases the disease is diagnosed too late.

Several tests are used to diagnose tuberculosis, depending on the type of TB suspected. The most important diagnostic methods include: X-ray, mantoux tuberculin skin test, IGRA test.

The usual treatment is: 2 antibiotics (isoniazid and rifampicin) for 6 months, 2 additional antibiotics (pyrazinamide and ethambutol) for the first 2 months of the 6-month treatment period.

In Poland, TB vaccination (BCG) is compulsory and is carried out on the first day after birth.

The global case-fatality rates are reported to be between 7% and 35%, and risk factors for death may include non-infective comorbidities, human immunodeficiency virus (HIV) infection and multidrug-resistant TB (MDRTB). Globally in 2018, 484 000 people developed TB that was resistant to rifampicin and of these, 78% had (MDR-TB).

The TB mortality rate (i.e. TB deaths among HIV-negative people per 100 000 population per year) is falling at about 3% per year, and the overall reduction in the period 2000-2017 was 42%.

WHO recommends preventive treatment for people living with HIV and all contacts living in households with TB.

TB is one of the major public health threats. Tuberculosis can have a different clinical course and is the most dangerous among immunocompromised patients such as those infected with HIV. The main problem in drug treatment is MDR-TB.

Key words: tuberculosis, symptoms, tests, treatment, vaccination, mortality, MDR-TB, HIV, Doctors Africa.