

# 6<sup>TH</sup> LUBLIN INTERNATIONAL MEDICAL CONGRESS FOR STUDENTS AND YOUNG DOCTORS

LUBLIN, 28<sup>TH</sup> - 30<sup>TH</sup> NOVEMBER 2019



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STUDENTS' SCIENTIFIC SOCIETY  
OF THE MEDICAL UNIVERSITY OF LUBLIN



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LUBLIN 2019

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# ABSTRACTS

# OPENING LECTURE

## **NUTRITION - WHY IT IS SO IMPORTANT FOR JUNIOR DOCTORS?**

Adam Alzubedi<sup>1</sup>, Paweł Polski<sup>1</sup>, Monika Kusz<sup>2</sup>, Przemysław Matras<sup>1</sup>, Sławomir Rudzki<sup>1</sup>

1 Department of General and Transplant Surgery and Nutritional Treatment, Medical University of Lublin, Poland

2 Department of Paediatric Nephrology, Medical University of Lublin, Poland

“Let food be your medicine and medicine be your food.” - said by Hippocrates around 400 BC is now more topical than ever. According to WHO in 2019 malnutrition as a global problem is the main cause of death and disease in the world. Collectively unhealthy diets are larger determinants of ill health than either high blood pressure or tobacco. It is expected of a junior doctor to be confident giving basic advice and care for the most common and fatal diseases. Malnutrition is prevalent and impacts on many physiological and biochemical processes in each body system and thus can lead to diet-related non-communicable diseases for which the first line of intervention would be lifestyle advice. All around the world junior physicians feel inadequately trained to counsel patients on physical activity and diet mostly because this knowledge is lacking in medical training. Nutrition science is often omitted or belittled in curricula, dietary interventions are considered to be outside of the evidence-based medicine, and the domain of dieticians rather than doctors. Medical students are routinely presented with evidence for pharmaceutical decision-making, but rarely empirical data about the impacts of nutrition or exercise. This undervaluation of nutritional knowledge continues when it comes to professional expectations. Understanding exactly what it means by “improving diet and lifestyle” could enable doctors to focus on how they counsel patients, personalized to comorbidities and individual needs giving the opportunity to prevent diseases on a large scale.



# **Basic Sciences and Experimental Medicine**

## **CORRECTION OF MORPHOLOGICAL CHANGES THAT OCCUR IN THE RATS SPLEEN ON THE BACKGROUND OF AN ACUTE STRESS REACTION WITH MEXIDOL CORRECTION**

Vladyslav Kyslyi, Oleksandra Torubara, Ilona Zakaznykova

**Scientific supervisor:** Pyroh-Zakaznikova A.V. PhD, Sovhyrya S.M. PhD

Department of Clinical Anatomy and Operative Surgery, Ukrainian Medical Stomatological Academy,  
Department of Pathological Anatomy with Section Course

**Introduction:** The adverse effects of stress reactions on the spleen in the medical community are well known. As the urgent task for medical science is now to search for new stress protectors, it is considered appropriate to study the antistress effect of Mexidol on the example of the spleen.

**Methods:** The morphological research was performed on 15 white male rats, 8-10 months old, with a body weight of 240-260 grams. First control group is consisted of 5 intact animals, the second control group is consisted of 5 animals that were exposed to acute immobilization stress, the third group included 5 rats whose stress model was formed after the previous administration of Mexidol. Acute immobilization stress was reproduced by fixing the rats in a supine position for 6 hours. In order to correct the stress reaction of rats of the experimental groups 25 mg of Mexidol was administered intraperitoneally 20 minutes before the fixation period. After slaughtering the animals and opening the abdominal cavity, a macroscopic examination of the spleen was performed and material was collected for microscopic examination. Histological preparations were stained with hematoxylin and eosin using standard techniques.

**Results:** The performed research shows that at the microscopic level in rats of the second group there were slight perivascular edema of the central arteries in the white pulp of the spleen, single hemorrhages, reduction of the diameter of the germinal centers of the lymph nodes. On the background of Mexidol correction similar morphological changes were not observed. The histological structure of the rat spleen of the experimental group was similar to that of intact animals of the first control group.

**Conclusions:** The results of morphological research on the example of the spleen indicate the feasibility of using Mexidol as a stress protector in acute stress reactions.

**Keywords:** spleen, Mexidol, stress.

## **ANTAGONISTIC INTERACTION OF CISPLATIN AND SIRTUIN INHIBITOR COMBINED TREATMENT IN BREAST CANCER IN VITRO MODEL.**

Anna Wawruszak, Marta Halasa, Andrzej Stepulak

**Scientific supervisor:** Andrzej Stepulak

Department of Biochemistry and Molecular Biology, Medical University of Lublin, Poland

**Introduction:** Sirtuin inhibitors (SIRTi) are a new class of active agents which affect the activity of histone deacetylases resulting in changed of acetylation in many proteins. SIRTi can induce apoptosis, cell growth arrest, inhibit proliferation and angiogenesis in many types of cancer cells. The aim of this study was to investigate the combined effect of cambinol (SIRTi) and cisplatin (CDDP) in breast cancer in vitro model.

**Methods:** The cytotoxic and anti-proliferative activity of cambinol used alone, or in combination with CDDP in MCF7, T47D, MDA-MB-231 and MDA-MB-468 human breast cancer cell lines were determined by means of MTT and BrdU tests, respectively. The type of pharmacologic interactions between SIRTi and CDDP was assessed using isobolographic analysis. Induction of apoptosis and cell cycle progression were assessed using a flow cytometer by active caspase-3 and propidium iodide.

**Results:** Cambinol used in monotherapy inhibited the proliferation of cancer cells, induced apoptosis and inhibition of the cell cycle in all types of breast cancer cell lines. Unfortunately, combination of cisplatin with cambinol at a fixed-ratio of 1:1 exerted antagonistic interaction.

**Conclusions:** Cambinol may be considered as a potential anti-cancer drug in monotherapy. However, it should not be combined with cisplatin in the treatment of breast cancer.

**Keywords:** breast cancer, sirtuin inhibitor, cambinol, cisplatin.

## **ADAPTIVE CHANGES OF TISSUES AROUND POLYMER IMPLANTED IN PYLORIC AND INTERNAL ANAL SPHINCTERS IN RATS**

Inna Koshkosh, Anastasiya Zernova

**Scientific supervisor:** Sozykin Aleksander

Department of Histology, Cytology and Embryology, Rostov State Medical University, Russia

**Introduction:** Polytetrafluoroethylene which has been successfully used to create artificial vessel prostheses, is one of the most optimal polymer options that can be used to isolate electronic correction devices from aggressive environments and immunocompetent cells of the body. The aim of our work was to study the adaptive capabilities of the connective and smooth muscle tissues of the stomach and internal anal sphincters. In the experiment adult rats had polytetrafluoroethylene experimentally induced in them. To accomplish this, the indicated polymer (1 cubic millimeter in volume) was surgically implanted in the muscle layers of the pyloric part of the stomach as well as the internal anal sphincter of 20 white Vistar rats. The material for the study was a fragment of the sphincters, 1 mm thick collected from 10 rats after a period of 6 months, and also from 10 rats, 1 year after the experiment.

**Methods:** Used methods: light microscope, cross-sectional electron microscope, immunohistochemistry and stereomorphometry.

**Results:** The study showed that the polytetrafluoroethylene implant, in 6 months after the surgical installation, was isolated from the surrounding smooth muscle tissue of the pyloric and internal anal sphincters by a continuous non-vascular connective tissue capsule, the average thickness of which was 2 mkm. In smooth myocytes located closest to the capsule, up to 19% of them have an increased nuclear cytoplasmic ratio. In their cytoplasm, the relative volumes of the elements of the granular endoplasmic reticulum, lamellar complex, and mitochondria are increased. Mechanical contacts (tight and desmosomal), as well as slit connections between leiomyocytes, are preserved. In the cells of the fibroblastic differon around the capsule, there was a high level of immunohistochemical expression of the nuclear antigen Ki-67 during both periods of the experiment. Reaction to the apoptotic marker P-53 was negative.

**Conclusions:** From the results obtained, the following conclusions can be drawn: the smooth muscle tissue around polytetrafluoroethylene implanted in the pyloric part of the stomach and internal anal sphincter preserves the integrity of the cluster organization, with the reorganization of myocyte groups into a “contractile-synthetic” phenotype.

**Keywords:** implant, muscle tissue, regeneration, pyloric part of the stomach.

## CHANGES OF VASCULAR TUNIC OF THE EYEBALL CAUSED BY OPIOID (ELECTRON MICROSCOPIC EXAMINATION)

Yana Kovtun

**Scientific supervisor:** Pidvalna U. Ye., PhD, Assistant Prof.

Department of Normal Anatomy, Danylo Halytsky Lviv National Medical University, Ukraine

**Introduction:** The need for the study of the effect of opioids on the physical condition is explained by the wide use of narcotic analgesics in medical practice both in cases when they are officially prescribed and used in a non-sanctioned way. Opioid analgesics are used in medical practice to reduce moderate and severe pain, but often the use of these drugs is getting out of control.

**Methods:** The experiment was carried out on 15 mature white male rats aged 3.0 months and body weight 160–180 g.. The experimental group consisted of 10 animals to which Nalbuphine hydrochloride was injected intramuscularly every day during 6 weeks (12.5 mg/kg). The control group consisted of 5 white rats to which saline solution was injected. The material for the study was represented by ultramicroscopic sections of the vascular tunic of the eyeball. The experiments were conducted in compliance with the provisions of the “Guide for the care and use of laboratory animals, 8th edition, 2011.” Euthanasia was performed by way of overdosing intraperitoneal anesthesia using Thiopental sodium.

**Results:** There are observed crucial changes in the capillaries’ structure after 6 weeks of injecting the narcotic analgesic. Cytoplasmic compaction is accompanied by organelle reduction. The number of autolysosomes is increased. Membrane-encased organelles are vacuolised. Pinocytotic vesicles merge with their membranes. Intercellular contacts between endothelial cells are disorganized. The nuclear membrane of the epitheliocytes is characterised by bundling and indistinction. Basement membrane loosed its distinct contour. Layers of disorganized connective tissue are increased between myocyte bundles. Changes in the epithelium of the ciliary processes are characterised by the disappearance of basal folding of the cytoplasm and enlightenment of the cytoplasmic matrix. There is also found increasing of number of fibroblasts in the connective tissues of the ciliary body.

**Conclusions:** After 6 weeks of experiment, areas of disorganization and destruction of epithelium of ciliary processes and iris are observed. Enlargement of connective tissue with the dominance of collagen fibers, visualization of smooth muscle elements is visualized which are signs of sclerosis. Injection of Nalbuphine during 6 weeks leads to destructive changes in the ultrastructure of the vascular tunic of the eyeball.

**Keywords:** nalbuphine, experimental study, rats, ultramicroscopy.

## CHANGES IN CELL MEMBRANES OF LEUKOCYTES IN RATS EXPOSED TO A COMMON FOOD ADDITIVE E407A

Anton Tkachenko, Anatolii Onishchenko, Oksana Nakonechna, Yevgen Posokhov

**Scientific supervisor:** -

Department of Biochemistry

The National Technical University “Kharkiv Polytechnic Institute”, Department of Organic Chemistry, Biochemistry and Microbiology, Kharkiv National Medical University, Ukraine

**Introduction:** Several recent papers have suggested to revisit the safety of the Food and Drug Administration-approved food additive carrageenan (E407 and E407a) used in the food industry as a thickener. Both refined food-grade (E407a) and semi-refined carrageenans (E407a or processed Eucheuma seaweed (PES)) have been reported to have adverse effects, in particular, they may induce intestinal inflammation. Thus, the aim of our study was to evaluate the state of phospholipid bilayer of white blood cells (WBCs) in rats orally exposed to PES using an environment-sensitive fluorescent probe 2-(2'-OH-phenyl)-5-phenyl-1,3-oxazole (probe O1O).

**Methods:** The experiment was performed on 16 adult female WAG rats randomly divided into equal groups. Group 1 included the animals daily orally exposed to E407a (1% solution in drinking water) during two weeks. The rats from group 2 obtained drinking water. Blood was collected. Leukocyte suspensions were prepared according to the lyse/wash procedure (Becton Dickinson Technical Support Protocol, 2002). The fluorescent probe was added to leukocyte suspensions obtained from the rats of both groups. The fluorescence spectra were recorded on a fluorescence spectrometer “Lumina” (Thermo Fisher Scientific) at room temperature.

**Results:** A statistically significant decrease in the spectra of the fluorescent probe was detected in rats exposed to PES compared with the control group indicating the reduction of microviscosity and enhancement of fluidity in the phospholipid membranes of WBCs in the region, where the probe locates, i.e. in the area of glycerol backbones of phospholipids, carbonyl groups of phospholipids and hydrocarbon chains of phospholipids (near the carbonyl groups of phospholipids). Such changes in the lipid order of leukocytes are attributed to the activation of leukocyte apoptosis, supported by an increase in the percentage of active caspase-3-positive peripheral leukocytes (assessed by flow cytometry) in rats exposed to PES during two weeks (unpublished data).

**Conclusions:** Oral consumption of the common food additive E407a during two weeks is accompanied by the changes in the lipid order of WBCs.

**Keywords:** carrageenan, food additive, fluorescent probe, cell membrane, leukocytes.

## **ORAL EXPOSURE TO CAFFEINATED ENERGY DRINKS AFFECTS VASCULAR ENDOTHELIUM IN THE HEART OF RATS**

Maryna Tkachenko<sup>1</sup>, Anatolii Onishchenko<sup>2</sup>, Tatyana Gorbach<sup>2</sup>, Anton Tkachenko<sup>2</sup>, Galina Gubina-Vakulyck<sup>3</sup>

**Scientific supervisor:** Prof. Oksana Nakonechna, DrSc, PhD, MD

<sup>1</sup>Department of Department of Internal Medicine No. 2, Clinical Immunology and Allergology named after academician L.T. Malaya, Kharkiv National Medical University, Ukraine <sup>2</sup>Department of Biochemistry, Kharkiv National Medical University, Ukraine <sup>3</sup>Department of Pathological Anatomy, Kharkiv National Medical University, Ukraine

**Introduction:** The popularity of caffeinated energy drinks (CEDs) has been increasing for last years. However, numerous studies have raised concerns about their safety. In particular, there is some evidence that CEDs have a negative impact on the heart. The study was designed to assess the state of endothelial lining in cardiac vessels of rats orally consumed a CED during 2 weeks.

**Methods:** Sixteen adult female WAG rats were randomly divided into two groups. Group A consisted of the animals daily orally exposed to a CED at a dose of 12 ml/kg of body weight during 2 weeks (n=8). Group B was composed of intact animals obtaining drinking water instead of the energy beverage (n=8). Hearts were collected from the rats of both groups. Half of cardiac muscle was used to prepare homogenates, while the second half was placed in a formalin solution to prepare paraffin-embedded sections. The content of endothelin-1 (ET-1) was determined in heart homogenates using ELISA. Expression of a stress-induced heat shock protein 90-alpha (HSP90-alpha) was assessed immunohistochemically. Mann-Whitney U test was selected to compare numerical values of two independent groups.

**Results:** The content of endothelium-derived ET-1, which is a potent vasoconstrictor, was statistically significantly 2.1-fold higher in rats exposed to a CED in heart homogenates than in the control group. Furthermore, the consumption of energy beverage was accompanied by overexpression of HSP90-alpha, a chaperone responsible for re-folding of misfolded proteins, in vascular endothelial cells in the heart of rats administered the CED compared with controls. Such findings may indicate the damage to vascular endothelial cells in response to energy drinks.

**Conclusions:** Thus, long-term consumption of CEDs by rats is associated with damage to endothelial lining in the cardiac vessels, evidenced by overproduction of ET-1 and upregulation of HSP90-alpha.

**Keywords:** caffeinated energy drinks, caffeine, endothelial dysfunction, HSP90-alpha, endothelin-1.

## THE PREVALENCE OF SURFACE PROTEIN GENES FROM ALPHA-LIKE PROTEIN (ALP) FAMILY IN *S. AGALACTIAE* CLINICAL STRAINS

Sylwia Dziemitko, Agata Świdorska, Anna Gutowska

**Scientific supervisor:** Dr n. med. Anna Gutowska

Department of Microbiological Diagnostics and Infectious Immunology, Medical University of Białystok, Poland

**Introduction:** *Streptococcus agalactiae* (GBS; Group B Streptococcus), a gram-positive coccus, is the leading cause of neonatal infections, such as sepsis, meningitis, and pneumonia. Treatment of these infections is difficult due to increasing antibiotic resistance and virulence of these bacteria. Alpha-like proteins (Alp) are important virulence factors that play role in invasion in cervical epithelial cells, mediates adherence, transmembrane passage, and translocation of GBS. The aim of this study was to evaluate the presence of Alp family genes and the resistance to antibiotics in *S. agalactiae* clinical isolates.

**Methods:** Eighteen *S. Agalactiae* isolated from vagino-anorectal samples from patients hospitalized in University Hospital in Białystok, since 10.2018 - 07.2019, were analyzed. Each isolate was identified by automated VITEK2 system and by inoculation onto Granada medium (GM). Three Alp genes (alp1, alp 2/3, alp4) were investigated by PCR amplification followed by gel electrophoresis. Susceptibility to antibiotics (penicillin G, erythromycin, clindamycin, levofloxacin, teicoplanin, vancomycin, minocycline, tetracycline, chloramphenicol, linezolid, rifampicin, and trimethoprim-sulfamethoxazole) and the occurrence of MLSB phenotypes (D-zone test) were determined using the disc diffusion method and interpreted according to the newest EUCAST guidelines.

**Results:** A half (50%) of tested GBS strains had Alp genes; alp1 and alp2/3 was found in 2 (11,1%) isolates, while alp4 gene was detected in 5 (27,8%) strains. All GBS (100%) were susceptible to trimethoprim-sufamethoxazole, chloramphenicol, and linezolid. High levels of resistance were observed for tetracycline and minocycline (88,9%). Moreover, 55,6% of tested isolates were resistant to penicillin G and vancomycin. D-zone test showed that 44,4% of tested isolates were susceptible to both clindamycin and erythromycin. Constitutive clindamycin resistance was detected in 38,9% of tested strains. Interestingly, three isolates (16,7%) were identified as rare L-phenotype.

**Conclusions:** We found that tested *S. agalactiae* strains differ in the presence of genes encoding GBS surface proteins from Alp family, which may affect their virulence. Moreover, this study showed high level of resistance to antibiotics and an alarming prevalence of MLSb phenotypes. However, further studies should be performed to extend these observations.

**Keywords:** GBS, alpha-like proteins, antibiotic resistance, virulence.



## **SIMILARITY AND DIFFERENCE IN TUMOR-INFILTRATING LYMPHOCYTES IN ORIGINAL TUMOR TISSUES AND THOSE OF IN VITRO EXPANDED POPULATIONS IN GLIOBLASTOMA**

Levan Tsaguria, Mariam Kalebashvili, Besik Tsintsadze, Nika Targaladze

**Scientific supervisor:** Alexandre Tavartkiladze - Assoc. Prof. MD, PhD

Oncology Department, Tbilisi State Medical University, Georgia

**Introduction:** Though adoptive tumor-infiltrating lymphocyte (TIL) therapy has been explored in clinical trials for many years, there is little information for the clonotype composition between TILs in original tumor tissues and TILs that were in vitro expanded and infused to cancer patients

**Methods:** To investigate the similarity/difference in TILs in original tumor tissues and those of in vitro expanded populations in glioblastomas as well as their correlation with somatic mutations in cancer cells, we performed whole exome analysis, expression profile analysis of immune-related genes, and T cell receptor (TCR) analysis of original TILs and in vitro expanded TILs in 8 surgically-resected fresh tumors with glioblastoma.

**Results:** We found an unusually high number of non-synonymous somatic mutations (4290, 1779 and 901 mutations) in three glioblastoma tumors, in which we identified mutations in mismatch repair genes, IDH and MGMT, or a DNA polymerase gene, POLE. Interestingly, dominant TCR clonotypes of expanded CD8<sup>+</sup> TILs derived from these three tumors revealed high similarity to those in original tumors while for remaining tumors with the lower mutational load, we found that T cell clonotypes between TILs in original tumor tissues and those expanded in vitro were almost entirely different.

**Conclusions:** Our findings might provide clinically useful information for identification of tumor-antigen-specific T cell clones that may lead to further improvement of adoptive TIL therapy for glioblastoma patients.

**Keywords:** T-cell receptor, mismatch repair, non-synonymous mutation, glioblastoma, tumor-infiltrating lymphocytes.

## **THE EFFECT OF TURMERIC EXTRACT ON THE ACTIVITY OF SELECTED MATRIX METALLOPROTEINASES (MMPS) IN CELL CULTURE MODELS OF ASTROCYTOMA AND ALZHEIMER'S DISEASE**

Angelika Mastalerczyk, Krzysztof Jędraszek, Mikołaj Skrzypczak

**Scientific supervisor:** Dr n. med. Anna Boguszewska-Czubara

Department of Medical Chemistry, Medical University of Lublin, Poland

**Introduction:** Curcuma longa, known as Turmeric has been used in natural and cosmetic medicine of the Far East for many centuries. For several years, its pro-healthy properties have attracted the attention of scientists. More and more clinical trials are being made aimed at the introduction of curcumin for treatment, in particular cancer and neurodegenerative diseases. Extracellular matrix metalloproteases (MMPs) are enzymes that degrade the extracellular matrix and basement membranes. Their increased concentration may suggest the occurrence of some pathological process.

**Methods:** The aim of this study was to examine the influence of active ingredient Curcuma longa: curcumin and turmeric extract on MMP-2 and MMP-9 activity in cell culture models: astrocytoma (1321N1) and Alzheimer's disease cellular model (SH-SY5Y + Okadaic Acid). Cytotoxicity was tested by the MTT test and the activity of MMPs was determined by gelatin zymography.

**Results:** The study showed that curcumin and turmeric extract caused a decreased secretion of examined MMPs (2 & 9) in cell lines: SH-SY5Y and 1321N1 and counteracted the toxic action of okadaic acid. The active compound of Curcuma longa increased cell viability in 1321N1 and SHSY5Y cell culture models.

**Conclusions:** Curcumin increased cell viability in astrocytoma cells culture and cellular model of Alzheimer's Disease. The active substance of turmeric extract decreased secretion of MMP-2 and MMP-9. MMP-9 counteracted the toxic effect of Okadaic Acid, therefore it may be involved in the etiology of Alzheimer's Disease. Further studies in this direction should be performed to prove this hypothesis.

**Keywords:** curcumin, matrix metalloproteinases, Alzheimer's Disease, astrocytoma, gelatin zymography.

## **THE ROLE OF CD16-NEGATIVE AND CD16-POSITIVE MONOCYTES IN THE MICROENVIRONMENT OF LEUKEMIC LYMPHOCYTES IN PATIENTS WITH CHRONIC LYMPHOCYTIC LEUKEMIA (CLL) - REVIEW**

Bartosz Twarowski, Wioleta Kowalska, Waldemar Tomczak, Agnieszka Bojarska-Junak, Jacek Roliński

**Scientific supervisor:** Wioleta Kowalska

Students Scientific Club at Chair and Department of Clinical Immunology, Medical University of Lublin, Poland;

Chair and Department of Clinical Immunology, Medical University of Lublin, Poland; Chair and Department of Haematology and Bone Marrow Transplantation, Medical University of Lublin, Poland

**Introduction:** Microenvironment for cancerous B lymphocytes in patients with CLL, including T lymphocytes, NKT cells and monocytes. Functional abilities of these cells are conditioned by the coexistence of specific dependencies occurring through BCR receptor, TLR receptor, or adhesion molecules. As a result of these interactions, cytokine and chemokine sequences are released that affect leukemia lymphocytes *in vivo*.

**Methods:** A review of the literatures defining original and reviewed scientific articles from the period 2017-2019, using the PubMed, Scopus and Google Scholar search engines.

**Results:** Currently published items specify that the role of CD16-negative (classical monocytes: CD14<sup>++</sup> CD16<sup>-</sup>) and CD16-positive monocytes, which include intermediate monocytes (CD14<sup>++</sup> CD16<sup>+</sup>) and non-classical monocytes (CD14<sup>+</sup>CD16<sup>++</sup>) is varied. Some authors believe that the subpopulation of monocytes showing high expression of the CD16 molecule with lower CD14 expression is defined as a group of cells having anti-tumor properties. In contrast to intermediate monocytes, which, due to the release of anti-inflammatory cytokines (mainly IL-10), inhibit the T-cell response, thus allowing the survival of leukemia lymphocytes in CLL.

**Conclusions:** To sum up, based on the studied articles, it can be stated that, despite numerous attempts to learn about the effects of classic, intermediate and non-classic monocytes on the microenvironment of leukemic lymphocytes, the unambiguous role of these cells in patients with CLL has still not been clarified. Undoubtedly, knowledge about these monocyte subpopulations in hematological patients should be systematically broadened.

**Keywords:** monocytes, microenvironment, CLL.

## THE EFFECT OF PHYSICAL ACTIVITY AND FOLK DANCE ON BALANCE

Dovile Meidute

**Scientific supervisor:** Dr. Aiste Paškoniene

Vilnius University, Lithuania

**Introduction:** Balance is one of the most important skills to have for dancing and other sports. The purpose of this study is to compare the potential influence of folk dancing and physical activity on static balance.

**Methods:** 2019 January – March a prospective study was conducted at Vilnius University Hospital Santaros Klinikos otorhynolaryngology center. The study included 17 national dance dancers and 14 healthy non-dancers who formed a control group. 7 participants were excluded for lower limb trauma, neurological disease, and uncorrected vision. The balance of the subjects was investigated using computerized posturography with the Tetrax system. Balance was assessed by comparing FI (falling risk) and SI (stability index).

**Results:** There were 8 women (66.67%, N = 12) and 4 men (33.33%, N = 12) in the dancer and control group. The average age of the dancers was  $21.5 \pm 1.97$  years and that of the control group was  $25.76 \pm 3.04$  years. BMI of dancers was  $20.28 \pm 1.44$ , control group -  $21.85 \pm 3.66$ . The dancers are physically active for  $4.48 \pm 1.6$  hours per week, control group  $0.71 \pm 0.88$  hours per week. Posturometry showed no statistically significant FI ( $p > 0.05$ ) between dancers and control group, meaning:  $15.83 \pm 7.11$  vs.  $26.17 \pm 17.34$ . No statistically significant differences in SI were found ( $p > 0.05$ ). Higher BMI was associated with a higher risk of falls ( $p = 0.037$ ) in the dancer group and ( $p = 0.006$ ) in the control group). The correlation between weekly physical activity and the risk of falls was found in dancers - the higher the physical activity, the lower the risk of falls. ( $p = 0.031$ ).

**Conclusions:** There is no statistically significant difference between the balance of folk dancers and non-athletes. Higher BMI is associated with higher risk of falls; increasing physical activity reduces the risk of falls.

**Keywords:** physical activity, posturography, balance.

## HEPARIN-BINDING COPOLYMER, A SAFE REVERSAL AGENT FOR LOW-MOLECULAR-WEIGHT HEPARINS

Justyna Świętoń, Bartłomiej Kałaska, Joanna Mikłosz, Dariusz Pawlak, Andrzej Mogielnicki

**Scientific supervisor:** Andrzej Mogielnicki

Department of Pharmacodynamics, Medical University of Białystok, Poland

**Introduction:** Low-molecular-weight heparins (LMWHs) are a group of drugs that prevent blood clotting. Despite being commonly used, they have only one antidote: protamine sulfate. Administration of protamine sulfate may cause life-threatening allergic reactions, leading to hypertension, pulmonary vasoconstriction, and bradycardia. Moreover, the efficacy of protamine sulfate for LMWHs neutralization is about 60%. Heparin-binding copolymer (HBC) is a diblock copolymer that reverses the anticoagulant effects of enoxaparin, fondaparinux, and unfractionated heparin. The aim of the present study was to evaluate the efficacy and safety of HBC as a reversal agent for all clinically relevant LMWHs.

**Methods:** In the in vitro efficacy study, HBC was added to one of LMWHs (enoxaparin, nadroparin, dalteparin, and tinzaparin) in rat and human citrated plasma. Then, the activity of the anti-factor Xa was measured for 4 concentrations of HBC. In the in vivo efficacy study, Wistar rats were injected with supratherapeutic doses of LMWHs or HBC was additionally infused in dose corresponding mass ratio. Then, bleeding time and anti-factor Xa were measured. In the safety study in rats, HBC was administered into the tail vein at the doses of 5, 10, 20, and 40 mg/kg. Animals were monitored for any signs of toxicity up to 4 days after HBC administration. The gross necropsy was conducted on day 4. Procedures involving the animals were approved by the Local Ethical Committee.

**Results:** HBC completely reversed anti-factor Xa activity of enoxaparin, nadroparin, dalteparin, and tinzaparin in both rat and human plasma at the mass ratio of 2.5:1. At the ratio of 1.25:1, HBC reversed anti-factor Xa activity in over 80% of dalteparin and tinzaparin. HBC also completely stopped bleeding and reversed anti-factor Xa activity after injection of enoxaparin, nadroparin, dalteparin, or tinzaparin ( $p < 0.001$  for all). HBC was well-tolerated up to 20 mg/kg in rats.

**Conclusions:** HBC might be an efficient and nontoxic substitute for protamine sulfate in LMWHs-treated patients with bleeding complications. Acknowledgment The work was funded by National Science Centre grant number 2016/21/B/ST5/00837 and Medical University of Białystok project number SUB/2/DN/19/003/2211. We would like to thank Professor Shin-Ichi Yusa and Professor Krzysztof Szczubiałka for synthesis and providing HBC for the study.

**Keywords:** HBC, heparin-binding copolymer, anticoagulation, LMWHs, protamine sulfate.

## **ANTIPLATELET EFFECT OF PROTAMINE IS ATTENUATED BY HEPARIN IN RATS AND MICE**

Aleksandra Jakimczuk, Joanna Mikłosz, Bartłomiej Kałaska, Dariusz Pawlak, Andrzej Mogielnicki

**Scientific supervisor:** Andrzej Mogielnicki

Department of Pharmacodynamics, Medical University of Białystok, Poland

**Introduction:** Protamine sulfate is widely used to neutralize the anticoagulant activity of unfractionated heparin (UFH). Unfortunately, some patients undergoing surgery exposed to protamine and UFH may develop thrombocytopenia, a decrease or increase of platelet activity, and the risk of bleeding or thrombosis. The interactions between protamine, UFH, and platelets are not still clear. We aimed to investigate the effect of protamine alone or complexed with UFH on the platelet number and their activity in rodents.

**Methods:** Procedures involving the animals and their care were approved by the Local Ethical Committee. The male BALB/c mice or Wistar rats were divided into 4 groups treated intravenously with a vehicle, UFH, protamine, and UFH followed by protamine. The blood samples were collected from the hearts of mice and the tail arteries of rats for measurement of the platelet count (ABC Vet, Horiba, Germany) and collagen-induced platelet aggregation (Chrono-log Corp., USA) 3, 15, 30 and 60 minutes after administration of drugs. The studies were funded by NCN grant number 2016/23/N/NZ7/00442.

**Results:** Protamine administrated alone reduced the number of platelets at 15th minute in mice by 26.5 %, while in group treated with UFH and protamine this effect was minimal. The number of platelets returned to normal range at 60th minute. In rats we did not observe any changes in the platelets count. Protamine alone significantly decreased area under the curve of platelets aggregation at 15th and 60th minute in mice by 55.9 %, and 25.2 %, respectively, and only at 60th minute in rats by 54.2 %. UFH attenuated the inhibitory effect of protamine on platelets.

**Conclusions:** Protamine directly inhibits the activity of platelets without inducing significant thrombocytopenia, while UFH attenuates this effect. The antiplatelet effect of protamine may carry a risk of bleeding in overdosed patients.

**Keywords:** heparin, protamine, thrombocytopenia, platelets, thrombosis, platelet aggregation.

## **CHANGES OF MORPHOLOGICAL AND ORGANOMETRIC PARAMETERS OF THE SPLEEN UNDER CONDITIONS OF INDUCED ONCOGENESIS IN THE DYNAMIC OF EXPERIMENT**

Iryna Shepet, Anna Komar, Yurii Soroka

**Scientific supervisor:** N. Lisnychuk, PhD

Central Research Laboratory, I. Horbachevsky Ternopil National Medical University, Ukraine

**Introduction:** New diagnostic methods of colorectal cancer are needed because early stage of the oncological process is asymptomatic.

**Methods:** Research was conducted on 168 mature outbred white male rats, kept in standard vivarium conditions. Animals were divided into 2 groups: control (84 animals) and a group with modeled oncogenesis (84 animals). Neoplastic injury was modeled by daily subcutaneous injection of 1,1-dimethylhydrazine dihydrochloride (DMH) (7.2 mg/kg) once a week for 30 weeks.

**Results:** After 30 weeks of experiment, microscopic changes of the spleen occurred.

Degenerative changes of the red pulp: zones of destruction, hemosiderin granules accumulation in macrophages. In white pulp – reduction of volume, width of the marginal zone, because of degeneration of lymphoid tissue. The disappearance of germinal centers in lymphoid nodes, disorganization of periarterial lymphoid zones on the periphery.

Submicroscopic research of spleen pulp has shown lymphocytes with signs of apoptosis.

Plasmacytes with expanded perinuclear spaces, filled with heterochromatin. Damaged mitochondrion with enlightened matrix and damaged crystae, large osmophilic fragments of phagocytosed cells in macrophages are also present. During the 30 weeks of observation rats bodyweight of the control group considerably increased, while in the experimental group – significantly decreased. Weight ratio was increasing proportionally with the body weight in control group, while in experimental one it was decreasing. Weight of injured rats spleen was decreasing, especially from 4th month. On the 30th week of the investigation, the spleen weight decreased by 23.8 % less than the initial mass. Reduction of spleen's length was noted in the 7th month. The width of the organ started to decrease from the 5th month of observation. A decrease in the thickness of the spleen was indicated in the 4th month of experiment and continued to reduce on 5th, 6th and 7th month ( $p < 0.001$  for all values).

**Conclusions:** This investigation proves that the DMH-induced colorectal cancer in rats causes significant morphological, organometric changes of the spleen. The severity of changes increased proportionally to the duration of the oncogenic factor application. Since observed changes can be detected during routine ultrasound examinations, cancer can be diagnosed in the early stage.

**Keywords:** spleen, induced oncogenesis, colorectal cancer, diagnostic.

## ASSOCIATION STUDY BETWEEN BGLAP GENE RS1800247 SINGLE NUCLEOTIDE POLYMORPHISM AND TYPE 2 DIABETES MELLITUS DEVELOPMENT IN UKRAINIAN POPULATION

Yaroslav Chumachenko, Yelizaveta Harbuzova

**Scientific supervisor:** Prof. Alexander Ataman, MD

Department of Physiology and Pathophysiology with Medical Biology Course, Medical Institute of Sumy State University, Ukraine

**Introduction:** Recent studies have shown that skeleton carries systemic energy metabolism regulation through the production of osteocalcin (OCN). Decarboxylated form of OCN is considered an insulin secretagogue and insulin sensitizer as it stimulates beta-cells proliferation and insulin expression as well as promotes adiponectin secretion, fatty acids and glucose utilization by muscles. Thus the thymine to cytosine transition occurred in the -198 position of BGLAP promoter region (rs1800247) could be associated with chronic hyperglycemia and insulin resistance occurrence.

**Methods:** The present study enrolled 153 patients (mean age [ $\pm$ SD] 64.67 $\pm$ 8.2 year) with diagnosed type 2 diabetes mellitus (T2D) and 311 control subjects (mean age 65.65 $\pm$ 12.58 year) without any carbohydrate metabolism disorders. Whole venous blood was used for DNA extraction. The main method of the research was polymerase chain reaction-restriction fragments length polymorphism analysis (PCR-RFLP) with further horizontal electrophoresis in agarose gel. All statistical calculations were done in SPSS 22.0 (Chicago, IL, USA).

**Results:** It was found that BGLAP rs1800247 genotypes distribution was TT – 66%, TC – 26.2%, CC – 7.8% in T2D group and TT – 59.2%, TC – 35.7%, CC – 5.1% in control group. However, there were no statistically significant differences in genotypes frequency ( $P = 0.087$ ). Then the logistic regression was used to study the association between BGLAP rs1800247-polymorphic variant and T2D development in dominant, recessive, over-dominant and additive models. It was found the significant protective effect of CT genotype in crude over-dominant model ( $P_c = 0.04$ ;  $OR_c = 0.638$ , 95% CI = 0.415-0.979) as well as after the adjustment for age, sex, BMI, smokers and arterial hypertension presence ( $P_a = 0.03$ ;  $OR_a = 0.608$ , 95% CI = 0.389-0.952). However, the association was lost after the Bonferroni correction for multiple comparisons ( $P_{ab} = 0.12$ ).

**Conclusions:** It was established the lack of association between BGLAP rs1800247 single nucleotide polymorphism and T2D development in Ukrainian population. Further studies are necessary to confirm these results. This study was a part of the scientific project “Molecular-genetic and morphological features of lower limb tissues regeneration under conditions of chronic hyperglycemia” [0117U003926].

**Keywords:** gene polymorphism, diabetes, BGLAP.



## **THIOSUGAR DERIVATIVES WITH THIADIAZOLE AND THIAZOLINE CORE FOR POTENTIAL USE IN CANCER THERAPY**

Adrianna Cieślak, Grzegorz Galita, Joanna Sarnik, Anna Czubatka-Bieńkowska, Zbigniew J. Witczak

**Scientific supervisor:** Tomasz Popławski

Department of Clinical Chemistry and Biochemistry, Medical University of Lodz, Poland; Department of Molecular Genetics, Faculty of Biology and Environmental Protection, University of Lodz, Poland; Wilkes University, Department of Pharmaceutical Sciences, Nesbitt School of Pharmacy, Wilkes-Barre, PA, USA

**Introduction:** In recent years, it has been noted that recurrence of ovarian cancer after initial platinum based chemotherapy is becoming more common, especially in advanced stages (FIGO III-IV). Novel selective anticancer agents, with minimal side effects, are required in the modern approach to cancer treatment. Application of carbohydrates naturally occurring in the cell is a promising new form of cancer pharmacotherapy. Particularly noteworthy are thiosugars and their derivatives called functional carb-pharmacophores (FCP), so far finding use in therapy of diabetes and some bacterial and viral infections. Thiosugars - conventional saccharides altered by the presence of a sulphur atom, provide stability in plasma and resistance to enzymes such as glycosidases, phosphorylases or glycosyltransferases.

**Methods:** The aim of the study was to compare biological properties between two newly synthesized thiadiazole and thiazoline derivatives named FCP24A and FCP27A. These drugs were tested on human ovarian cancer cell line (A2780). Cytotoxicity and cell viability were tested with In Vitro Toxicology Assay Resazurin based (Sigma-Aldrich) to estimate the change in cell metabolism. Inhibitory concentration curves were obtained for the tested drugs. Genotoxicity was evaluated with alkaline versions of comet assay.

**Results:** Cytotoxic activity was determined and half maximal inhibitory concentration (IC<sub>50</sub>) values were: 56.21 and 47.72  $\mu$ M for FCP24A and FCP27A, respectively. FCP24A showed high level of anticancer activity, with induction of DNA lesions observed in alkaline version of comet assay (24.52% DNA damage in tail after 90min incubation).

**Conclusions:** The thiosugar motif appears to be a promising lead for future antineoplastic therapy.

**Keywords:** functional carb-pharmacophores (FCPs), thiosugars, ovarian cancer cells.

## **THE EFFECTS OF DIFFERENT DECELLULARIZATION PROTOCOLS ON THE IMMUNE MODULATORY PROPERTIES OF HUMAN ACELLULAR DERMAL MATRICES**

Cezary Pawlukianiec, Jordan Holl, Dawid Groth, Kamil Grubczak, Izabela Popławska

**Scientific supervisor:** Andrzej Eljaszewicz MD, Prof. Marcin Moniuszko

Department of Regenerative Medicine and Immune Regulation, Medical University of Białystok, Poland

**Introduction:** Diabetes mellitus is a global pandemic, affecting over 425 million people worldwide. Diabetic foot ulcer (DFU) is a common severe complication of diabetes, which often leads to lower limb amputation. Human acellular dermal matrices (hADMs) are a promising treatment for chronic non-healing wounds such as DFUs. However, appropriate decellularization methods are required to obtain hADMs with optimal therapeutic properties. Therefore, in this study, we aimed to investigate the effect of different decellularization protocols on hADM immune modulatory properties.

**Methods:** First, hADMs were prepared from the skin, obtained from bariatric patients undergoing abdominoplasty, by using three distinct decellularization protocols (hADM1, hADM2, hADM3). The decellularization effectiveness was analyzed by using histochemical and immunohistochemical stainings. Next, hADMs were co-incubated for 7 or 14 days with density gradient centrifugation-derived CFSE-stained peripheral blood mononuclear cells (PBMCs) to evaluate the immunogenicity. T cell proliferation was measured by flow cytometry. For the analysis of immune modulatory properties, different hADMs were co-incubated with PBMCs for 24, 48, or 72 hours and T cell activation and cytokine production were analyzed by flow cytometry.

**Results:** We found that all three used protocols were efficient in the decellularization processes. More importantly, hADM1 showed no immunogenic effect, while hADM2 and hADM3 induced T cell proliferation, suggesting their higher immunogenicity. Somewhat surprisingly, no significant differences were observed in T cell activation and cytokine production after three-day culture.

**Conclusions:** Taking together, we developed a protocol for effective decellularization of human skin from bariatric donors that has potential use in the preparation of allogenic hADM-based dressings. However, further studies are necessary to analyze their effectiveness in wound healing *in vivo*.

**Keywords:** human acellular dermal matrix, diabetic foot ulcers, immunogenicity, impaired wound healing.

## **INHIBITION OF THE UPR SIGNALING PATHWAY MAY PROVIDE A NEW TREATMENT APPROACH FOR COLORECTAL CANCER**

Natalia Siwecka, Adam Wawrzynekiewicz

**Scientific supervisor:** Wioletta Rozpędek PhD, Dariusz Pytel PhD, Professor J. Alan Diehl PhD, Prof.

Ireneusz Majsterek PhD

Department of Clinical Chemistry and Biochemistry, Medical University of Lodz, Poland

**Introduction:** Hypoxia alters cancer cell metabolism and directly induces the Endoplasmic Reticulum (ER) stress and activation of the Unfolded Protein Response (UPR) signaling pathway. The major branch of UPR, PERK/eIF2-alpha, becomes activated in order to maintain cellular proteostasis and redox balance within cancer cell and evade apoptosis simultaneously. However, upon chronic hypoxia, antioxidant defense fails and the apoptosis is triggered via PERK-dependent CCAAT-enhancer-binding protein homologous protein (CHOP). This effect is highly desirable and can be considered a new target for anti-cancer therapy. Thus, the present study aimed to evaluate the effectiveness of the selected, small-molecule PERK inhibitor.

**Methods:** To assess the effectiveness of the PERK inhibitor, the human colon adenocarcinoma HT-29 cells were exposed to the inhibitor at the concentration range of 6-50µM for 1h, and subsequently treated with an ER stress inducer, thapsigargin (Th) at 500nM for 2h. Cells treated with Th only served as a positive control, whereas untreated cells as a negative control. The measurement of p-eIF2-alpha level was determined by the Western blot technique. The cytotoxic effect of the investigated inhibitor was identified by the Pierce LDH Cytotoxicity Assay Kit. The experiment was conducted both on HT-29 and the normal human colon epithelial CCD841CoN cell lines at inhibitor concentrations rising from 0,75micromol to 100micromol, incubated for 16, 24 and 48h. Cells treated with the media containing 1microliter DMSO constituted a positive control.

**Results:** The Western blot analysis demonstrated significant inhibition of eIF2-alpha phosphorylation at inhibitor concentrations of 25micromol and 50micromol. Substantial cytotoxic activity of the inhibitor against HT-29 cells was achieved at concentrations of 50µM and higher in dose- and time-dependent manner. The viability of CCD841CoN cells was not significantly impaired, regardless of all concentrations and incubation times used.

**Conclusions:** Nowadays, treatment of colorectal cancer (CRC) is still insufficient, since many CRC cases demonstrate high recurrence rates and chemoresistant phenotype. Therefore, it becomes essential to design new, effective drug, with maximized therapeutic effect and minimized side effects. Thus, we may conclude that small-molecule PERK inhibitors seem to be a powerful weapon in development of targeted therapy against CRC.

**Keywords:** UPR, PERK, ER stress, oxidative stress, apoptosis, PERK inhibitors, colorectal cancer treatment.

**BAFF-BAFF-R SIGNALING REGULATES NLRP3 INFLAMMASOME ACTIVATION IN LPS STIMULATED MONOCYTES**

Agata Niechoda, Marlena Tynecka, Aleksandra Starosz, Kamil Grubczak

**Scientific supervisor:** Dr. Andrzej Eljaszewicz, Prof. Marcin Moniuszko

Department of Regenerative Medicine and Immune Regulation, Medical University of Bialystok, Poland

**Introduction:** B-cell activation factor (BAFF) and a proliferation-inducing ligand (APRIL), were shown recently to play crucial role in B cell development and function and to promote survival and proliferation of malignant B and acute myeloid leukemia blasts. Both BAFF and APRIL may act through direct interaction with cell membrane receptors, namely TACI (Transmembrane activator and CAML interactor) and BCMA (B-cell maturation antigen), while BAFF-R (B-cell activating factor receptor) is specific to BAFF only. Interestingly, normal myeloid cells were shown to express BAFF and APRIL receptors. However, to date, the effect of both ligands on the function of the above-mentioned cells is not fully elucidated. Therefore, in this study, we aimed to understand the role of BAFF and APRIL signaling in monocyte/macrophage inflammatory response.

**Methods:** First, peripheral blood monocytes were isolated by the means of anti-CD14 magnetic beads separation (positive selection). Freshly isolated cells were stimulated with LPS (Lipopolisaharyde) for 6 and 12 h in the presence or absence of human recombinant BAFF or APRIL. Next, we used flow cytometry and ELISA to analyze cytokine production and release. In addition, western blot was used to analyze IL-1beta cleavage. Furthermore, we used functional assay with blocking antibodies to analyze the effects of different BAFF related pathways activation. Finally, we performed detailed BAFF-BAFF-R pathway analysis by qPCR.

**Results:** We found that BAFF but not APRIL regulate IL-1beta production and release in LPS stimulated monocytes. Next, by using WB, we observed that BAFF significantly decreased IL-1beta cleavage, suggesting a role in NLRP3 inflammasome regulation. Interestingly, by using functional assay with blocking antibodies, we found that BAFF-R but not TACI and BCMA signaling decrease NLRP3 inflammasome activation and IL- 1beta processing in LPS stimulated monocytes. Finally, after qPCR and BAFF-BAFF-R pathway analysis, we found potential molecular mechanisms of observed phenomenon.

**Conclusions:** In conclusion, we showed for the first time evidence that BAFF-BAFFR signaling play a role in the regulation of innate immune responses in human monocytes/macrophages.

**Keywords:** monocytes, BAFF, BAFF-R, inflammasome, NLRP3, IL-1-beta.

## ARE THE PROPORTIONS OF TREG/TH17 CELLS ALTERED IN THE COURSE OF RECURRENT FURUNCULOSIS?

Martyna Podgajna, Michał Mielnik, Mateusz Mielnik

**Scientific supervisor:** Ewelina Grywalska, MD, PhD, Assoc. Prof.

Chair and Department of Clinical Immunology, Medical University of Lublin, Poland

**Introduction:** Regulatory T cells (Tregs) constitute only approximately 10% of a population of CD4<sup>+</sup> cells in the peripheral blood, but they play an important role in many physiologic and pathologic processes such as autoimmune reactions, infections, and carcinogenesis. Tregs and Th17 functioning may be impaired in patients with recurrent furunculosis (RF). The aim of the study was to analyze possible changes in CD4<sup>+</sup> lymphocyte T subsets, especially Treg and Th17 in patients with recurrent furunculosis, and to assess the relations between increased susceptibility to infections and Treg/Th17 status in this group in comparison to healthy controls.

**Methods:** Peripheral blood samples from 30 patients with RF and 20 healthy age- and sex-matched subjects underwent the examination. The percentage and number of Th17 cells, Tregs and other basic lymphocyte subsets were analyzed.

**Results:** Tregs and CD3<sup>+</sup>CD4<sup>+</sup> counts were significantly lower in patients with RF ( $p < 0.0001$  and  $p = 0.0003$ ), while Th17 and CD19<sup>+</sup>CD25<sup>+</sup> cell counts were significantly higher ( $p = 0.0450$  and  $p = 0.0119$ ) in comparison with controls. Strong positive correlations occurred between the following subsets of cells: Th17 and Th CD3<sup>+</sup>CD4<sup>+</sup> ( $r = 0.55$ ); CD3<sup>+</sup>CD4<sup>+</sup>T17 and CD3<sup>+</sup>CD4<sup>+</sup> lymphocytes ( $r = 0.66$ ); CD3<sup>+</sup>CD4<sup>+</sup> lymphocytes and CD3<sup>+</sup>CD25<sup>+</sup> lymphocytes ( $r = 0.69$ ), and between lymphocytes B and CD19<sup>+</sup>CD25<sup>+</sup> lymphocytes ( $r = 0.81$ ).

**Conclusions:** Proportions of subpopulations of lymphocytes in patients with RF distinguish from those in healthy subjects. We assume that a decrease in the percentage and number of Tregs along with a decrease in the number of Th CD3<sup>+</sup>CD4<sup>+</sup> and increase in the percentage and number of Th17 may be one of the factors participating in the pathogenesis of RF.

**Keywords:** recurrent furunculosis, Treg, Th17, dermatology.

## SERUM HIF-1 ALPHA PROTEIN LEVEL AS A DIAGNOSTIC MARKER OF OSA

Magdalena Rogut, Bartosz Szmyd

**Scientific supervisor:** Agata Gabryelska MD PhD, Piotr Białasiewicz MD PhD

Department of Sleep Medicine and Metabolic Disorders, Medical University of Lodz, Poland

**Introduction:** Prevalence of obstructive sleep apnoea syndrome (OSA) has greatly increased in recent years. Multiple screening tools, such as questionnaires, have been devised to assess the risks of OSA. Biochemical markers that have been proposed so far are not highly predictive of this syndrome. One of the typical complications of OSA is intermittent hypoxaemia. Hypoxia-inducible factor 1 (HIF-1) is a key regulator of cellular oxygen metabolism, which makes it a likely candidate for a diagnostic marker in OSA diagnostics. Therefore, the aim of our study was to assess value of serum HIF-1-alpha protein concentration as a predictor of OSA.

**Methods:** The study group included 84 patients with presumptive OSA diagnosis, who underwent standard nocturnal polysomnography (PSG) examination. Patients diagnosed with chronic respiratory conditions were excluded. Peripheral blood samples were collected in the evening before and in the morning following PSG examination, and centrifuged. Serum was collected and HIF-1 protein concentration was assessed by ELISA.

**Results:** Severity of OSA was based on apnoea-hypopnea index (AHI). Twenty-four (28.6%) individuals were categorised as  $AHI < 5$  and therefore declared a healthy control. There were 17 (20.2%), 19 (22.6%), and 24 (28.6%) individuals who met diagnostic criteria for mild ( $5 \leq AHI < 15$ ), moderate ( $15 \leq AHI < 30$ ), and severe OSA ( $AHI \geq 30$ ), respectively. Median HIF-1-alpha concentration in the morning was 1252.6pg/mL (interquartile range (IQR): 762.3-1795.4). Cut-off point of 1055.6pg/mL was chosen as having the best diagnostic value in OSA diagnosis ( $AHI \geq 5$ ). The calculated area under the curve (AUC) was 0.841 (95%CI: 0.753-0.929;  $p < 0.001$ ). For this cut-off point, the sensitivity, specificity, positive and negative predictive values were 80%, 83%, 92%, and 63%, respectively. Similar results were achieved regarding serum HIF-1-alpha protein concentration in the evening with a median of 1178.8pg/mL (IQR:851.1-1876.9;  $p = 0.601$ ), which suggests circadian stability.

**Conclusions:** The obtained diagnostic values for HIF-1-alpha protein level indicate its usefulness, as compared to currently proposed biomarkers and scales. High levels of HIF-1-alpha serum protein are compatible with OSA diagnosis, while low level can exclude severe OSA with high probability.

**Keywords:** OSA, obstructive sleep apnoea, HIF, HIF-1, biomarker.

## EFFECTS OF BTK INHIBITORS ON MACROPHAGE FUNCTION

Adam Michalski, Izabela Morawska, Michał Zarobkiewicz

**Scientific supervisor:** Dr hab. n. med. Agnieszka Bojarska-Junak

Department and Faculty of Clinical Immunology, Medical University of Lublin, Poland

**Introduction:** A Bruton tyrosine kinase (BTK) inhibitor, Ibrutinib, is a drug used in treating chronic lymphocytic leukemia, mantle cell lymphoma and Waldenström macroglobulinemia. Ibrutinib is responsible for blocking signals that stimulate malignant B cells to grow and divide. Beside its effects on B-cells, ibrutinib affects other cells, such as the macrophages - cells involved in innate immunity whose task is to find, phagocyte and destroy pathogens. In addition, macrophages are an important source of proinflammatory cytokines and are responsible for recruitment of other immune cells. The correct functioning of macrophages is necessary for effective protection against severe infections. A better understating of how BTK inhibitors affect immune system as a whole is crucial in making the therapy safer.

**Methods:** Method used was an analysis of 11 articles focused on this subject.

**Results:** Recent studies show that, on a top of an inherent susceptibility to infections caused by primary diseases, ibrutinib might increase that risk even further. Ibrutinib affects macrophages abilities to release cytokines such as TNF-alpha, IL-8 or IL-10. It has been found that ibrutinib downregulates M1 pro-inflammatory profile and may be responsible for increased frequency of infections. Phagocytosis is also affected, study focused on response to Mycobacterium tuberculosis (Mtb) shows that M1 subpopulation polarized in the presence of ibrutinib demonstrated a small, but considerable increase in the uptake of that pathogen, while its intracellular growth remained unaffected. On the other hand, the intracellular growth of Mtb in the M1 macrophages already infected before the treatment with ibrutinib was significantly increased and their ability to kill the pathogen was impaired.

**Conclusions:** BTK inhibitors affect not only B lymphocytes, but also other immune cells, such as the macrophages. This effect must be taken into consideration during therapy with this type of drug due to increased risk of opportunistic diseases, an example of those being systemic mycoses and tuberculosis, especially in countries with higher risk of Mtb infections.

**Keywords:** bruton tyrosine kinase, ibrutinib, leukemia, lymphoma, macrophage.

## **ANALGESIC TREATMENT IN PATIENTS HOSPITALIZED FOR ORTHOPEDIC REASONS**

Agata Węgrzyniak, Piotr Piech, Wojciech Wokurka, Małgorzata Neścior-Piech, Gabriela Kuroska

**Scientific supervisor:** Gabriela Kuroska, MD

Human Anatomy Department, Medical University of Lublin, Poland

**Introduction:** An important issue of orthopedics and traumatology is the pain management. The choice of therapy ought to be based on proper assessment of pain, monitoring and appropriate selection of analgesics. The introduction of multimodal analgesia was enabled due to the knowledge of pathomechanism of pain development. It was made possible through the combination of different drug classes and interaction at many levels of the formation and processing of the pain stimulus. Adequate pain control is an important step leading to therapeutic success and indirectly into the time and costs of hospitalization and patient satisfaction. Despite introduction of new generations of analgesics and diffusion of knowledge about the mechanisms of pain development, the results are still unsatisfactory.

**Methods:** The review was conducted on published systematic studies and current outlines of perioperative pain management among orthopedic patients. Searches were performed on platform PubMed, MEDLINE, EMBASE using standardized keywords. Two reviewers independently selected articles whose eligibility was assessed based on the abstracts. Full text data analysis was performed on all chosen publications.

**Results:** Based on the selected subjects it was created a summarization of actual guidelines. The decision concerning the method of analgesia in a group of orthopedic patients is complex and depends on varied factors such as: type and extent of injuries sustained, cardiovascular and respiratory fitness, the presence of comorbidities, the state of the coagulation system, known drug allergies, current nutritional status and others. The combination of drugs from different groups gives the chance to minimize the dose with unchanged analgesic strength. It is especially recommended for extensive operations and procedures with a high risk of chronic pain. During the period following operation, should be applied the treatment which enables various diagnostic procedures.

**Conclusions:** Many different pain regimens available for orthopedic patients have clinical effectiveness. According to the latest literature, the multimodal approach has the advantage over single opioid therapy. It is the reason for using many different groups of drugs influencing at different levels of pain conduction.

**Keywords:** trauma, management of pain, orthopedic surgery.



## **GOLD NANOPARTICLES WITH HIGH ACTIVITY AGAINST ESCHERICHIA COLI STRAINS CAUSING URINARY TRACT INFECTIONS**

Łukasz Suprewicz , Ewelina Piktel, Sylwia Chmielewska, Joanna Depciuch, Magdalena Parlinska-Wojtan

**Scientific supervisor:** Prof. dr hab. Robert Bucki

Department of Medical Microbiology and Nanobiomedical Engineering, Medical University of Białystok, Poland

**Introduction:** Urinary tract infections (UTIs) are one of the most common infections worldwide. They high rate reoccurrence and ever-growing antibiotic resistance of *Escherichia coli* strains recognized as their main cause, demand novel strategies to be described. Gold nanoparticles were proposed as effective therapeutic agents against broad spectrum of pathogens, both bacteria and fungi. Importantly, killing capabilities of metal nanostructures might be modulated and further augmented by the changes in their size and shape. We hypothesized that gold nanoparticles might be an innovative approach to develop the material that might be use especially in developing urinary catheter for UTIs prevention.

**Methods:** Antibacterial effect of nonspherical gold nanoparticles against 10 clinical strains of *E.coli*, isolated from the patients diagnosed with UTI was investigated using killing assay and minimal inhibitory concentration (MIC) assessment. Prevention of biofilm formation and ability to eradicate a pre-formed biofilm were determined using resazurin-based fluorimetric method. Proliferation capability of treated bacteria, permeabilization of their outer and inner membrane, and reactive oxygen species generation upon nanoparticles treatment were evaluated using fluorimetric assays. Biocompatibility of tested nanoparticles against T24 epithelial urinary bladder cells and red blood cells was determined using MTT assay, resazurin-based proliferation assay and hemolysis assay respectively. Release of interleukin-6 (IL-6) from bacterial-infected T24 cells was measured using ELISA kit.

**Results:** Nonspherical gold nanoparticles are characterized by high bactericidal activity against both planktonic and biofilm form of *E.coli*, regardless of the mechanism of drug resistance, which is determined by the generation of reactive oxygen species in treated bacteria and increase in permeability of inner and outer bacterial membrane. Tested nanoparticles both prevent formation of biofilms by clinical isolates of *E.coli* and disrupt pre-formed biofilms, reducing the likelihood of reinfection. Importantly, in bactericidal doses, tested gold nanoparticles are characterized by satisfactory biocompatibility against both urinary bladder cells and red blood cells, indicating possibility to employ them in systemic therapy. Decrease of IL-6 release from bacteria-infected epithelial cells suggest their immunomodulatory properties.

**Conclusions:** Nonspherical gold nanoparticles expressed significant bactericidal efficiency against bacteria causing UTIs comparing to commonly used antibiotics such as ciprofloxacin and gentamycin.

**Keywords:** urinary tract infection, Gold nanoparticles, Bacterial drug resistance.

# Case Report

## **RARE CASE OF SEVERAL TUMORS OF THE BREAST, URINARY BLADDER, THYROID GLAND, UTERUS, GALLBLADDER AND SUBCUTANEOUS FAT**

Andrew Wireko, Toufik Abdul-Rahman, Mykola Lyndin, Vladyslav Sikora, Nataliia Hyriavenko

**Scientific supervisor:** MD, prof. Anatolii Romaniuk

Department of Pathology, Medical institute, Sumy State University, Ukraine.

**Background:** The presence of several tumors in one patient is rare case. In this case, the development of two or more tumors in one patient called multiple primary tumor. These tumors can occur simultaneously or with certain time intervals.

**Case Report:** We present a case of combined tumors with localization in the breast, urinary bladder, thyroid, uterus, gallbladder and subcutaneous fat in old woman. The development of all malignant tumors in all cases was accompanied by the presence of benign precancerous processes. We made histological examination of tumor tissue, immunohistochemical investigation of estrogen, progesterone, HER2/neu, Ki-67, p53, bcl-2 and bax receptors in neoplasms tissue, microsatellite instability and mutations in MLH1, MSH2 and MSH6 genes. Histological examination revealed the presence of follicular thyroid cancer, moderately varied uterine adenocarcinoma with metastases in the left fallopian tube, high-grade papillary urothelial carcinoma and infiltrative ductal carcinoma a low degree of differentiation with metastases in lymph nodes. Steroid sensitive tissue of the uterus and mammary gland did not express ER and PR in both cases. The tissue had overexpression of Ki-67, p53, bax and bcl-2 receptors in all cases. Having established the presence of microsatellite instability we have found no mutations in genes.

**Conclusions:** These studies show that neoplastic tissue in all cases had high rates of cells proliferative activity and their antiapoptotic stability, the availability of the expression of prognostically unfavorable receptors and the absence of prognostically favorable markers. This indicates the existence of common mechanisms of malignant tumors development and their genetic predisposition that can be clearly seen in many generations.

**Keywords:** combined primary cancer, uterine adenocarcinoma, follicular thyroid cancer, papillary urothelial carcinoma, infiltrative ductal carcinoma.

**BONE CEMENT IMPLANTATION SYNDROME – CASE REPORT**

Bartosz Stangiewicz

**Scientific supervisor:** Dr n. med. Rafał Kowalczyk

Student's Science Club "Ankona", 1st Clinic of Anaesthesiology and Intensive Care, Medical University of Warsaw, Poland

**Background:** Bone Cement Implantation Syndrome (BCIS) is a life threatening complication which occurs during surgeries including bone cementing, hip or knee arthroplasty. BCIS symptoms are: Hypoxia, Hypotension, Unexpected loss of consciousness, Cardiac arrhythmias, Cardiac arrest, Increased pulmonary resistance BCIS etiology and pathophysiology is not clearly explained. There are a few theories trying to explain the mechanism of BCIS. They are: monomer- mediated model, embolic model, histamine release and hypersensitivity model as well as complement activation and multimodal model. None of them are surely confirmed.

**Case Report:** An 88 year old female posted for rearthroplasty of the left hip joint after periprosthetic fracture of femur. Patient has a history of hypertension, heart arrhythmias, ischemic heart disease and diabetes mellitus. Graded as third category according to ASA physical status classification system. General anesthesia was induced with a following USG controlled block of the iliac fascia. During anesthesia the general condition of the patient was unreservedly stable. One minute after the application of cement general condition got worse. Hypotension occurred, with decreasing value from 120/70mmHg to 80/45mmHg, additionally saturation dropped from 100% to 86% and heart rate raised from 58 bpm to 92 bpm. Aortic blood analysis showed acidosis (pH 7,23), pressure of oxygen and carbon dioxide were maintained within the normal range (pO<sub>2</sub> 74 mmHg pCO<sub>2</sub> 42mmHg). Infusion of norepinephrine 0,5mcg/50ml was given. Patient was then ventilated with 100% oxygen. Crystalloids were administered as well. General condition of the patient began to improve. Post operative arterial blood gas analysis and chest X-ray remained normal.

**Conclusions:** Bone Cement Implantation Syndrome is a severe complication of surgeries that involve bone cement use. Carefull monitoring of patient's condition and preparation of specific procedures to manage possible complications may positively affect prevention and treatment of BCIS episodes in orthopedic surgery.

**Keywords:** bone cement, complications, hypoxia, hypotension, hip arthroplasty.

## UPS AND DOWNS IN A COURSE OF CANCA VASCULITIS- CASE REPORT

Michał Smyka, Rafał Oleszczuk, Jakub Mendocha, Emil Pencuła

**Scientific supervisor:** Dr n. med. Agnieszka M. Grzebalska

Student Research Group at the Nephrology Department, Medical University of Lublin, Poland

**Background:** Wegener's granulomatosis (WG) is a systemic disease, characterized by the presence of ANCA and damage to small and medium in size blood vessels. In the past mortality because of WG was high. Since corticosteroids (Csd) and cyclophosphamide (Cyc) in WG treatment are used the survival time is markedly prolonged. In the course of WG remissions and relapses are observed. Although achievement of the remission is now more frequent than in the past, relapses are still a problem. It is suggested that age, heart involvement and cANCA presence are most important. The aim of this study is to present the ups and downs observed in a course of WG in a 72 year old lady.

**Case Report:** In April 2014 a 67 year old woman was sent to our hospital with temperature, edema, elevated creatinine, proteinuria and erythrocyturia. cANCA positive vasculitis was diagnosed. Renal function decreased to the end-stage renal disease (ESRD) quickly, despite immunosuppressive treatment (methylprednisolon and Cyc i.v.) was turned on immediately. Because of the renal insufficiency hemodialysis (HD) were performed. After some weeks the patient was transferred to peritoneal dialysis (PD). Immunosuppressive treatment was continued. In November 2014 renal function improved. Creatinine level decreased to 2.2mg%, so PD was ceased. As maintaining treatment she was given prednisolone and mycophenolate mofetil (MMF). No activity of WG was observed. Renal function was stable – creatinine level 1.6mg%. In November 2018 we found the sudden worsening of renal function, hypertension and overhydration. We considered the relapse of the disease and started once again with immunosuppressant to achieve remission. Also dialyses were begun: first HD then PD. In April 2019 we found no more ANCA in blood analysis, also the patient's condition was improved however, not kidney function. She still requires dialyses. The last chapter of this story is not ended yet. In September we found once more clinical symptoms of the another one relapse.

**Conclusions:** As we described above the medical history of our patient is a never-ending story, which consists of consecutive ups and downs.

**Keywords:** Wegener's granulomatosis, treatment, remission, relapse.

## FEVER OF (UN)KNOWN ORIGIN

Anna Ziółkowska, Magdalena Peikert

**Scientific supervisor:** Mikołaj Radziszewski, MD

Department of Internal Medicine and Endocrinology, Medical University of Warsaw, Poland

**Background:** Effective communication is integral to the general practice consultation. Unfortunately, lack of cooperation and miscommunication with patients are still common impediments in achieving therapeutic goals. This is particularly evident in case of sensitive subjects such as sexually transmitted diseases (STDs). Fever of unknown origin (FUO) is defined as fever at or above 38.3°C for 3 weeks or more that remains undiagnosed after 3 days of in-hospital testing or during two or more outpatient visits. It may be caused by neoplastic, infectious, inflammatory and miscellaneous disorders. Evaluation should be based on history and physical examination, with particular consideration of risk factors and probably causes depending on individual circumstances.

**Case Report:** A 43-year-old man was referred to hospital due to mild prolonged fever, despite paracetamol and naproxen, hematochezia and persistent malaise for over a month. He denied hematemesis, melena or abdominal pain. The patient was active smoker for 4 years with a history of colitis chronica superficialis, suspicion of borreliosis, positive antinuclear antibodies (ANA) and incident of colorectal carcinoma in immediate family. On physical examination vital signs were normal with body temperature at 38.5°C and cervical, left axillary and inguinal lymphadenopathy. Differential diagnosis included vasculitis, non-Hodgkin lymphoma, Lyme disease and viral infection. Laboratory studies indicated normocytic anemia and increased levels of C-reactive protein (12.8 mg/l), rheumatoid factor (32 IU/ml) and Erythrocyte Sedimentation Rate (94 mm/h). Accessory investigations ruled out herpesviruses and human immunodeficiency virus infections. Moreover, neck and abdomen ultrasound revealed enlarged inguinal lymph nodes with normal sonographic feature. Simultaneously, a decision to reinterview the patient was made. Obtaining confirmation of multiple risky behaviour, past test results and spreading the diagnostic process made it possible to establish former secondary syphilis and current Chlamydia trachomatis infection. Additionally, foodborne Yersinia coinfection was discovered. Therefore, treatment with doxycycline was administered, which affected both bacteria so the remission of current symptoms was observed.

**Conclusions:** FUO remains one of the most difficult diagnostic challenges and in almost 25% of cases the cause cannot be determined. For this reason, the patient-doctor interview skills are crucial and require continuous improvement.

**Keywords:** fever of unknown origin. medical interview. sexually transmitted diseases.

## **NEUROLOGICAL COMPLICATIONS OF LVAD – ACUTE ISCHEMIC STROKE TREATED WITH MECHANICAL THROMBECTOMY**

Joanna Sawicka, Aneta Stabryła

**Scientific supervisor:** Dr. Marcin Wiącek

Students Scientific Association of Neurology, College of Medical Sciences, University of Rzeszów, Poland

**Background:** A left ventricular assist device (LVAD) is a apparatus that is used for patients who have achieved an end-stage cardiac insufficiency . The device assists the inefficient heart chamber to pump blood. LVAD are used as a "bridge" for recovery, heart transplantation, or as a target treatment. We present a case of acute ischemic stroke (AIS) as a complication of LVAD, treated with mechanical thrombectomy.

**Case Report:** A 40-year-old patient with dilated cardiomyopathy (diagnosed 2015), implanted left ventricular assist device (LVAD HeartWare) (since August 2018) was admitted to the Neurology Clinic (23/09/2019) two hours after occurrence of aphasia and upper right limb paresis. Head CT angiography of cerebral vessels revealed obstruction in the terminal segment of the left internal carotid artery (ICA). Due to chronic warfarin therapy with international normalized ratio (INR) value of 2,55, the patient was disqualified from thrombolytic therapy, in favor of mechanical thrombectomy. The procedure went without complications, with successful recanalization of ICA. On the first day of hospitalization, the patient's neurological condition has improved significantly.

**Conclusions:** The use of LVAD carries a risk of complications. Blood flowing over a non-biologic surface, may cause a thrombus formation resulting in peripheral vessel embolization, most commonly AIS. Therefore, there is a need for anticoagulation. Each patient with LVAD should be carefully monitored and should be treated individually in this regard.

**Keywords:** LVAD, stroke, mechanical thrombectomy.

## REVERSIBLE CEREBRAL VASOSPASM SYNDROME IN MIGRAINE

Aneta Stabryła, Joanna Sawicka

**Scientific supervisor:** Dr. Marcin Wiącek

Neurological Students Scientific Association, College of Medical Sciences, University of Rzeszów, Poland

**Background:** Reversible cerebral vasoconstriction syndrome is a disease characterized by a weeks-long course of thunderclap headaches, sometimes focal neurologic signs, and occasionally seizures. Symptoms are thought to arise from transient abnormalities in the blood vessels of the brain. Due to the symptoms resemblance of a variety of life-threatening conditions, differential diagnosis is necessary.

**Case Report:** On July 4, 2019, a 32-year-old man with sarcoidosis was admitted to the ICU after an episode of sudden cardiac arrest due to ventricular fibrillation. The patient was sedated and intubated. As a result of the treatment, improvement has been achieved and sedation was stopped. On July 24, 2019, during hospitalization at the cardiology clinic, an several-hour lasting episode of aphasia-type speech disorders and weakness of the right upper limb was observed. CT and angio-CT of the head were performed (suspected stroke of the left hemisphere of the brain), revealing hypodense changes and extensive vasoconstriction. The examination was followed by a headache (due to aphasia no medical history could be taken). Considering neurological deficits and angio-CT results, isolated primary angiitis of central nervous system (PACNS) was suspected and steroids and immunosuppression treatment was introduced. It appeared that symptoms reported by patient have been occurring for many years every several months, rising doubts about primary diagnosis Nevertheless, treatment was decided to be maintained. Head MRI have not revealed any significant abnormalities. After several weeks digital subtraction angiography (DSA) was performed, with normal cerebral vasculature. It was then concluded that the stenosis was transient and most likely it was a result of reversible cerebral vasoconstriction syndrome (RCVS) in the course of migraine with aura.

**Conclusions:** In presented patient with recurrent infrequent episodes of migraine with aura, during one of the episodes some imaging features of cerebral vasoconstriction were noted. He was misdiagnosed and treated as PACNS. The resolution of vessel narrowing after several weeks suggested a diagnosis of RCSV in a course of migraine and allowed for discontinuation of unnecessary immunosuppression.

**Keywords:** reversible vasospasm syndrome, migraine, sarcoidosis.



## **IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION (IPAH) - A SEVERE DYSFUNCTION DEMANDING DOUBLE LUNG TRANSPLANTATION WITH EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) - CASE REPORT.**

Damian Maruszak, Małgorzata Kowacka, Marcelina Łazaj, Maria Królikowska

**Scientific supervisor:** Maciej Urlik MD, Tomasz Stącel MD PhD, Remigiusz Antończyk MD

Department of Cardiac, Vascular and Endovascular Surgery and Transplantology in Silesian Center for Heart Diseases in Zabrze, Medical University of Silesia in Katowice, Poland

**Background:** IPAH (idiopathic pulmonary arterial hypertension) is considered as a rare disease with prevalence rate about 6 per million adult population. The disorder is characterised by obstruction of small pulmonary arteries which leads to progressing right ventricular failure. Untreated IPAH leads ultimately to death. IPAH can be treated by lungs transplantation. The procedure seems to be effective and extends patients' life.

**Case Report:** 39-year-old woman with diagnosed IPAH has been admitted to the Transplantology Department in Silesian Center for Heart Diseases in Zabrze. The patient was in WHO class IV and demonstrated severe dysfunction of right heart, moderate secondary tricuspid valve regurgitation and 8 mm pericardial effusion. Additionally, the woman was afflicted by secondary thrombocytopenia amounting to 46000/mm<sup>3</sup>. The patient was qualified to double lung transplantation, which was successfully completed, after 152 days on national waitlist. Due to the features of significant right ventricle pressure overload it was decided to use veno-arterial Extracorporeal Membrane Oxygenation support during the surgery and for 4 days after the transplantation. The postoperative control chest X ray has revealed a hematoma in the right pleural cavity which required reoperation. The patient was discharged from hospital on day 51st after the surgery in a good general condition. 2,5 months after the transplantation the patient was able to complete the six-minute walk test (6MWT) achieving the distance of 517,7 m.

**Conclusions:** IPAH is a disorder leading to life-threatening dysfunction of circulatory system. In an advanced stage of disability, lung transplantation supported by short use of ECMO is an ultimate and appropriate treatment for such patients.

**Keywords:** transplantation, double lung transplantation, ECMO, IPAH, pulmonary hypertension.

## DISASTROUS COURSE OF DIABETES MELLITUS AFTER ACUTE PANCREATITIS

Magdalena Suchodolska

**Scientific supervisor:** Dr hab. n. med. Andrzej Prystupa

The Department of Internal Medicine, Medical University of Lublin, Poland

**Background:** Diabetes mellitus is one of complications after acute pancreatitis occurred in 15% of patients. This disease is known as post-pancreatitis diabetes mellitus (PPDM) and it has highly unstable carbohydrate metabolism. The most probable mechanism of PPDM is progressive damage of pancreatic alpha and beta cells during the acute pancreatitis. As a result secretion of insulin and glucagon is impaired, which cause an unpredictable course of diabetes and long-lasting hypoglycaemia.

**Case Report:** 57-year-old patient was hospitalized at The Department of Internal Medicine due to infection of diabetic foot ulcers. During the hospitalization the insulin pump was used to reduce a high level of hyperglycaemia (490 mg/dl) and an antibiotic was administered. The diabetic foot ulcers, which were on both feet, were cleared by a surgeon. The patient has suffered from diabetes mellitus since 1994. Four years earlier he has an acute pancreatitis, complicated by cardiopulmonary arrest. Since then he has dealt with many diabetic complications. Bilateral diabetic foot syndrome was a first complication and it appeared 7 years after diagnosis. In the course of diabetes the patient has suffered from diabetic foot syndrome for many times, the current ulcers has been lasting for 4 months. Earlier, in 2016 the patient got through sepsis after infection of diabetic foot ulcers. In 2011 he has a stroke complicated with complete, bilateral loss of sight. At present apart from aforesaid complications the patient suffers from: ischemic heart disease; diabetic nephropathy – chronic renal disease stage IV; diabetic retinopathy; bilateral maculopathy; advanced, bilateral sensorimotor polyneuropathy; autonomic neuropathy of cardiovascular system and digestive tract.

**Conclusions:** This patient despite correct treatment and early implementation of insulin therapy still suffers from unstable diabetes. In addition to pharmacological treatment the patient adheres to prescribed diet and undertakes a physical effort adjusted to his possibilities. This case shows how dramatic are results of post-pancreatitis diabetes mellitus, in which so many complications are presented despite a correct therapy.

**Keywords:** diabetes mellitus, post-pancreatitis diabetes mellitus, complications of diabetes mellitus, diabetic foot syndrome.

## **PAROXYSMAL EPIGASTRIC PAIN CAUSED BY GALLBLADDER-DUODENAL FISTULA DETECTED WITH ULTRASOUND**

Tan Zhi Ying, Aakanksha Karthik

**Scientific supervisor:** Dominika Jaguś MD, Ewa Białek MD PhD

Department of Imaging Diagnostics, Mazovian Brodnowski Hospital, Medical University of Warsaw, Poland

**Background:** Cholecystoduodenal fistula is uncommonly found between the gallbladder and duodenum, hence enabling it to be classified as a bilio-enteric fistula. These types of fistulas follow the onset of chronic cholecystitis leading to the adherence of the gallbladder to the duodenum and wall penetration by gallstones. Ultrasound (US) was the primary modality in the diagnosis of this fistula which underlines the unique way in which this condition was uncovered.

**Case Report:** The patient is a 54-year-old female, who was admitted to the hospital following epigastric pain. She appeared with a negative Murphy's sign and no cholestasis nor acute inflammation was indicated in the laboratory tests. An emergency US was carried out showing attachment between the bowel loops and the gallbladder along with air bubbles between the two and the presence of gallstones.

**Conclusions:** The result of the US image raised a suspicion of vesico-duodenal fistula in the patient which was subsequently confirmed with computer tomography (CT). This depicts the significance of ultrasonography in this case as it was the primary diagnostic tool of this patient's condition.

**Keywords:** cholecystoduodenal fistula, gallstones, cholecystitis, ultrasound.

## ACUTE PERICARDITIS UNSPECIFIED DIAGNOSTIC AND TREATMENT – CASE REPORT

Olga Wysokińska, Krystian Cholewa

**Scientific supervisor:** Dr n. med. Marek Prasał

Cardiology Department and Clinic, Medical University of Lublin, Poland

**Background:** Of all the diseases which affect pericardium, acute pericarditis is the most frequent one. It concerns even 5% of the patients admitted to the emergency department with chest pain not connected to myocardial ischemia. Although there is plenty of known possible causes of pericarditis, approximately 80% of cases are qualified as idiopathic.

**Case Report:** The case concerns a 73-year-old man, who was transferred to the cardiology clinic from the other center due to further diagnostic of pericardial effusion and heart palpitations symptom. The patient reported fatigue, weakness, dyspnea and severe palpitations, nonetheless his state was stable. His blood pressure was 127/71 and temperature was 38° C. ECG showed atrial fibrillation with a rapid ventricular response about 160/min – the electrical cardioversion was accomplished with success and the return of accurate sinus rhythm was observed. 1,5 cm of fluid in pericardial sac was detected in echocardiography. In repeated ECG subtle features of pericarditis – ST elevation and PR depression (I, II, aVF, V2-V6). There was a decreased level of C-reactive protein (CRP=164,067mg/l). Laboratory tests and examinations recommended by rheumatological and pulmonological consultants were also carried out – cancer markers and anti-cardiolipin antibodies were not increased. The following inflammatory factors have been excluded: CMV, HCV, HIV, EBV, HSV, echovirus, enterovirus, Coxsackie virus and Mycobacterium tuberculosis. The treatment included pharmacotherapy with colchicine and ibuprofen. According to the substantial, persistent rise of inflammatory parameters vancomycin treatment was recommended, although the blood culture and procalcitonin were negative. Echocardiography that was repeated after 3 weeks of treatment showed a decrease of the pericardial effusion to 1,25 cm. Likewise, a systematic decrease of CRP and resolution of the fever was observed. The patient has been discharged in good general condition with a recommendation for further treatment – colchicine for the next 3 months and ibuprofen for the next 2 weeks, as well as a control echocardiography in one month.

**Conclusions:** Diagnostic of acute pericarditis is elaborate and not always ends with the identification of the direct cause of the disease. Nonetheless, colchicine and NSAID pharmacotherapy is effective in acute nonspecified pericarditis treatment as well as in preventing recurrences.

**Keywords:** pericarditis treatment, acute pericarditis nonspecified.

## FROM SIGNS OF RADIAL NERVE PALSY TO DIAGNOSIS OF LUNG CANCER

Magdalena Peikert, Anna Ziólkowska

**Scientific supervisor:** Mikołaj Radziszewski, MD

Students' Scientific Group 'Endocrinus', Department of Internal Medicine and Endocrinology, Medical University of Warsaw, Poland

**Background:** Lung cancer is a malignant neoplasm of the highest mortality both in men and women in Poland. The majority of patients presents with a disease in advanced stage since prodromal signs and symptoms are often nonspecific and emerge lately. The most frequent manifestations include cough (50-75%), haemoptysis (20-50%), dyspnoea (25-45%) and chest pain (20-40%). However, there are countless possible ways lung cancer can reveal itself.

**Case Report:** A 67-year-old man with a history of 30 pack-years of smoking and no chronic diseases was referred to hospital due to pain in left elbow joint (8 NRS) and signs of radial nerve palsy. He denied any trauma, deep and superficial sensation in the limb remained unchanged. Lungs were clear to auscultation. After orthopaedic consultation the patient was diagnosed with tennis elbow and received platelet rich plasma injections. Additionally, he was consulted by neurologist. Elbow joint X-Ray was taken, revealing fracture of neck of left radius. Diagnosis of pathological fracture was established with suspicion of either primary or secondary neoplastic lesion, hence CT scan was indicated. Further investigations involved abdominal ultrasound which showed 2 focal lesions in the liver and chest X-Ray (no infiltrations detected). CT scan of the neck, chest and abdomen was also carried out. Among significant findings there were: thickened bronchial wall with narrowing of the lumen, metastases in the liver, mediastinal lymphadenopathy, infiltrations in vertebrae and left radius. In the performed fiberoptic bronchoscopy right lung tumour was visualised and material was taken for histopathological examination. Patient had been receiving compound analgesic treatment before histopathology results arrived. Immediately conducted PET/CT scan confirmed diffuse progressing neoplastic process with primary site of onset in the right lung and multiple metastases to the liver, mediastinal lymph nodes and skeletal system. Histopathological findings allowed the diagnosis of planoepithelial lung cancer. Eventually, the patient was referred to the oncology centre.

**Conclusions:** Any symptom or sign arising suspicion of cancer, especially intense pain, should initiate an insightful diagnostic process until the disease is ruled out or diagnosed. Even apparently unrelated symptom may be a manifestation of cancer and must not be ignored.

**Keywords:** lung cancer, metastases, radial nerve palsy.

## **PROGRESSIVE SUPRANUCLEAR PALSY – DIAGNOSTIC AND CLINICAL PROBLEMS**

Piotr Jarosz, Izabela Kobiałka, Maciej Kamieniak, Natalia Wolanin, Kamil Kośmider

**Scientific supervisor:** Véronique Petit, MD

Department of Neurology, Medical University of Lublin, Poland

**Background:** Progressive Supranuclear Palsy (PSP) is a rare neurodegenerative disease occurring with a frequency of 6 per 100,000 people and belongs to the group of atypical parkinsonisms. It usually begins in the sixth decade of life. Due to the etiology, PSP is classified as taupathy, the essence of which are degeneration in the form of neuronal atrophy, gliosis and neurofibrillary changes in various subcortical and ophthalmic motor nuclei. It is characterized by the occurrence of dystonic rigidity of the neck and axial muscles, frequent falls, supranuclear vertical gaze palsy and pseudo-bulbar palsy.

**Case Report:** This study presents the case of a 65-year-old patient admitted to a Department of Neurology in order to broaden the diagnosis of progressive extrapyramidal syndrome. The patient reports a worsening of gait and contact recently. Neurological examination revealed paralysis when looking up and down, nystagmus when looking from side to side, exaggerated startle reflex, dysarthric speech and features of Parkinson's syndrome (axial stiffness, gait on stiff limbs). MRI showed cortical subcortical atrophy in the fronto-parieto-temporal region, reduced midbrain volume, with normal bridge volume as well as thinning of the lid plate and concave lateral strokes of the midbrain, which together with the clinical picture corresponded to PSP. A neuropsychological assessment (MMSE, five-word test, clock test, verbal fluency test) was carried out and showed impairment of working memory and indicated a slight dementia syndrome.

**Conclusions:** The patient was diagnosed with progressive supranuclear palsy on the basis of the examination and the results of tests. Careful diagnosis is needed to differentiate PSP from very similar dementia diseases such as Parkinson's disease or Multiple System Atrophy with prevailing Parkinson's symptoms (MSA-P). No effective treatment for PSP is currently known. At the initial stage, drugs used to treat Parkinson's disease may be helpful, for example levodopa, but they become less and less effective over time, therefore eventually symptomatic treatment is introduced.

**Keywords:** progressive supranuclear palsy, atypical parkinsonism, taupathy.

## **RESPIRATORY FAILURE AS A CLINICAL CHALLENGE IN AMYOTROPHIC LATERAL SCLEROSIS – CASE REPORT**

Piotr Jarosz, Maciej Kamieniak, Izabela Kobiałka, Natalia Wolanin, Kamil Kośmider

**Scientific supervisor:** Véronique Petit, MD

Department of Neurology, Medical University of Lublin, Poland

**Background:** Amyotrophic lateral sclerosis (ALS) is the most common progressive motor neuron disease and an example of neurodegenerative disease as well. When ALS affects the anterior horns of the spinal cord, it causes atrophy of voluntary muscles, while involvement of the lateral cords in the spinal cord reveals as spasmodic syndrome with pyramidal symptoms. Although the disease may initially affect one part of the motor tract, eventually both upper and lower motor neurons are always affected. The first ALS symptoms usually appear between 50 and 70 years of age. The incidence of the disease is estimated to be around 7 in 100,000 and it is more common in men.

**Case Report:** This study presents a 73-year-old patient who was admitted to the Department of Neurology because of the deterioration of his respiratory efficiency in the course of the disease. The diagnosis of ALS was made a year earlier. Neurological examination revealed anartria, logical contact, weakened palatine and pharyngeal reflexes, paralysis of the tongue with its atrophy, four-limb paresis, atrophy of the muscles of both hands and neck as well as muscles of the left lower limb, and symmetrical strong stretch reflexes. As a result, the patient was qualified for care by a long-term home care team for mechanically ventilated patients and received his own home respirator.

**Conclusions:** Diagnosis of ALS is based mainly on the clinical picture and requires differentiation with other potential causes of damage to the upper or lower motor neuron. The prognosis is unfavorable, only 5% of patients survive ten years, and only 25% five years. Although the symptoms can be very diverse, respiratory muscle atrophy and subsequent respiratory failure is one of the main causes of patient death and requires special attention during the treatment of ALS patients. Special programs facilitating ambulatory care of such patients may contribute to increasing both the quality and perhaps the life expectancy of patients suffering from ALS.

**Keywords:** amyotrophic lateral sclerosis, motor neuron, neurodegeneration.

## **COMPLICATIONS OF PERMANENT CARDIAC PACEMAKER IMPLANTATION ON THE EXAMPLE OF A PATIENT WITH A SECOND DEGREE PAROXYSMAL ATRIOVENTRICULAR BLOCK**

Piotr Jarosz, Maciej Kamieniak, Natalia Wolanin, Kamil Kośmider, Izabela Kobiałka

**Scientific supervisor:** Michał Trojnar, MD, PhD

Department of Cardiology, Medical University of Lublin, Poland

**Background:** Electro stimulation of the heart is based on stimulating the heart rhythm with electrical impulses generated by a device implanted subcutaneously, through leads implanted into the heart chambers - the right atrium and/or the right ventricle. The main indications for implantation of a pacemaker are congenital and acquired disorders of the conductive system of the heart. Due to the specificity of such treatment, numerous complications may occur. The incidence of complications is 1-6%.

**Case Report:** The presented case concerns a 34-year-old woman who was diagnosed with a second degree paroxysmal atrioventricular block in March 2015. It was decided to implant a dual-chamber, rate-modulated (DDDR) pacemaker. The patient became pregnant in mid-2018. In March 2019, pregnancy was terminated by Caesarean section. After few days an infective endocarditis was diagnosed. The decision was made to remove the pacemaker until the infection is cured. After a month, the pacemaker was implanted again. Then, in June 2019, displacement of the ventricular electrode and perforation of the right ventricular wall were discovered – the dislocated lead was replaced. At the beginning of October 2019, the patient returned to the hospital again, reporting severe chest pain. During the echocardiographic examination of the heart, a small puncture of the right ventricular wall was detected - a team of specialists decided to remove the pacemaker completely. The symptoms subsided and the patient was discharged from hospital.

**Conclusions:** The described case is an example of complications of two different mechanisms, a biological – an infective endocarditis and mechanical – the damage done to the ventricular wall by the lead. There is a time coincidence between Caesarean section and endocarditis; however it is unclear, if there is an actual cause and effect relationship. Complications after the implantation of the pacemaker are becoming rarer due to the technological progress in this field and the improvement of the procedure itself.

**Keywords:** cardiac device-related infective endocarditis, CDRIE, ventricular wall perforation.



**DIFFERENT TYPES OF MENTAL DISORDERS PRESENT IN ONE FAMILY**

Kalina Kolasińska, Julia Suwalska

**Scientific supervisor:** Dorota Łojko, MD, PhD

Department of Adult Psychiatry, Poznan University of Medical Sciences, Poland

**Background:** Symptoms of depression differ among patients; several subtypes of depression, including melancholic, atypical, seasonal, psychotic and anxiety-depressive have been described in the literature. There is no specific gene responsible for depression, however genetic susceptibility to depressive disorders has been confirmed. In offspring of depressive patients, the risk of depression is 15-30%, which is twice as much as in the general population. The aim of the present study was to describe various psychiatric disorders occurring in women in one family.

**Case Report:** Female patient K.M., aged 67 – diagnosed with psychotic depression in March 2019. First depressive symptoms occurred in June 2018 after treatment of Lyme disease and operation for cataract, both of which caused psychological stress for the patient. The patient noticed decreased mood and worse functioning. She was prescribed antidepressants by a psychiatrist and after five weeks her state improved. Since December she developed subsequent depressive episode. In March 2019 she was admitted to psychiatric hospital due to severe mood decrease, refusal to eat and drink resulting from delusions that her intestines were constricted. Her sister, A.K., aged 48 was diagnosed with melancholic depression 18 years ago. She manifested symptoms of low mood, worse in the morning, weight loss, insomnia, social withdrawal and self-harm. She was hospitalized three times, twice of which after suicide attempts. B.S., K.M.'s older daughter was at first diagnosed with mixed anxiety-depressive disorder. The diagnosis was later changed to recurrent depressive disorder, due to a recurrent nature of disorder, with dominant anxiety symptoms - mild in intensity with no need of hospitalization. K.L. is K.M. patient's younger daughter. She was hospitalized because of anorexia (BMI 15). At present, patient suffers from recurrent episodes of mood disorders, with severe lack of appetite and weight loss during every episode.

**Conclusions:** Stress-vulnerability model assumes interaction between stress and patient's susceptibility in mental disease development. In the family described in the study, several different mental diseases were present. Given the fact that many environmental factors can modify clinical picture of illness, presence of mental disorder in several family members suggests strong genetic load.

**Keywords:** depression, mental disorders, family, genetics.

## **PARANEOPLASTIC AUTOIMMUNE ENCEPHALITIS AS A DIAGNOSTIC AND A THERAPEUTIC CHALLENGE.**

Katarzyna Bednarz, Joanna Bielewicz, Sara Dankiewicz, Sebastian Bróz, Monika Kitowska

**Scientific supervisor:** Joanna Bielewicz

Department of Neurology, Medical University of Lublin, Poland

**Background:** Autoimmune encephalitis is a rare disease typically diagnosed within young females with paraneoplastic teratomas. The multiple of various symptoms can be distinguished into three specific groups, appearing in an order: 1. Flu-like symptoms, 2. Psychosis, 3. Autonomic nervous system disorders and dyskinesia. The cause of such a diverse symptoms are antibodies produced as the response for a neoplastic lesion, blocking the receptors of the limbic system, brain stem, cerebellum, spinal cord, and others.

**Case Report:** The presentation deals with 20-year old female with autoimmune encephalitis associated with ovarian immature teratoma. The diagnosis was formed approximately after a month since the first symptoms appeared. Before, the patient was treated ambulatory for an upper respiratory tract inflammation by the GP, then in endocrinology ward for a massive hyponatremia due to psychogenic polydipsia. Consequently, the disease was diagnosed late and its course was rapid and severe, including residency in the ICU and respiratorotherapy. After creating the right diagnosis, the patient went through immunotherapy, plasmapheresis, ovarian surgery and adjuvant chemotherapy. At present, she goes through rehabilitation and is still regularly controlled by psychologists and neurologists, slowly recovering.

**Conclusions:** Most frequently, autoimmune encephalitis has a rapid course and is still often misdiagnosed due to evident psychotic states, cognitive deterioration, endocrine and autonomic disorders, plus many non specific symptoms, that leads the patients and their families to general practitioners, psychiatrists, endocrinologists in the first place. All of the symptoms are the consequence of the functional receptor disorders, thus are mostly reversible. That is why proper diagnosis and prompt treatment, involving tumour removal and immunotherapy, may bring positive therapeutic effects and even lead to full recovery.

**Keywords:** autoimmune encephalitis, ovarian teratoma, paraneoplastic syndrome, immunotherapy.

**ANTISYNTHETASE SYNDROME: A CASE REPORT**

Kotryna Liberyte, Enrika Logvinovaite

**Scientific supervisor:** Prof. Dr. Irena Butrimiene

Centre of Rheumatology Vilnius University Hospital Santaros Klinikos, Vilnius University, Lithuania

**Background:** Antisynthetase syndrome (AS) is a rare chronic autoimmune condition. Symptoms usually include interstitial lung disease, myositis, polyarthritis, Raynaud's phenomenon. The etiology is linked to the production of autoantibodies which attack certain enzymes. We present a case of AS which was diagnosed in a patient who at first was diagnosed and treated for pneumonia.

**Case Report:** 66-year-old woman was suffering from chronic dry cough, with slight sputum; shortness of breath after minor exercise; painful joints of hands, knees, elbow and left shoulder; dull pain on the both sides of the chest and cracked skin on hands. After two months from the onset of these symptoms a chest roentgenogram was performed. Pneumonia was diagnosed and it was treated with five different antibiotics with no success. The patient was admitted to the department of pulmonology, computer tomography was performed and signs of pneumonia were found. Bronchoscopy and bronchoalveolar lavage showed the signs of chronic bronchitis. Analysis of bronchoalveolar lavage did not show any significant pathological changes. After performing cryobiopsy of the lungs nonspecific interstitial pneumonia was diagnosed. One week after hospitalization dyspnea worsened, right-sided pneumothorax occurred and thoracic drain was inserted. Because of the pain and swelling of joints patient was consulted by a rheumatologist. Roentgenogram of hands showed periarticular osteoporosis of wrists and fingers. Rheumatoid factor was negative, however in ENA: Ro-52 and Anti-Jo-1 were found. Considering arthritis, muscle stiffness and weakness the patient was transferred to the department of rheumatology. Muscle biopsy was performed and it showed diffuse myositis. Creatin kinase, myoglobin, AST, CRP were increasing considerably; blood in the urine was observed. The patient's condition improved after pulse-therapy using Methylprednisolon (total dose 3000mg/v). Patient continues taking 60-40 mg/day prednisolone and Methotrexate 10 mg/weekly is added.

**Conclusions:** In this case along with other clinical symptoms the positive anti-Jo-1 was the main laboratory marker for diagnosis of AS. Our patient had interstitial lung disease, polymyositis, arthritis and "mechanical hands" - 4 diagnostic criteria of AS syndrome which was successfully treated with methylprednisolone pulse therapy and high prednisolone doses, following methotrexate therapy.

**Keywords:** antisynthetase syndrome, interstitial lung disease, anti-Jo-1.

## DIAGNOSTIC RIDDLE AT PEDIATRIC ICU

Julia Giełdon, Karolina Mikołaj

**Scientific supervisor:** Dr. Magdalena Mierzewska-Schmidt

Department of Anesthesiology, Intensive Care and Postoperative Care, Medical University of Warsaw, Poland

**Background:** Thiamine is an essential vitamin for cellular metabolism. Thiamine pyrophosphate is cofactor in the Krebs Cycle and many other metabolic pathways, it also plays fundamental role in synthesis of neurotransmitters. Thiamine deficiency is known as Beriberi and it is rarely considered a problem among children in developed countries. Main causes of B1 deficiency are alcoholism, HIV, diseases/operation of digestive tract, dialyses.

**Case Report:** 11- year-old conscious boy in severe condition was admitted to the Intensive Care Unit with dyspnea, tachypnea, low blood pressure. He was transferred from the Department of Gastroenterology with hyperglycemia, high lactic acid concentrations and severe metabolic acidosis. Bed-side ultrasound examination revealed cardiac tamponade, bilateral pleural and peritoneal effusions, and residual food content in esophagus and stomach. Pericardiocentesis was performed and catecholamines were administered . Despite intensive treatment the patient's condition did not improve- cardiogenic shock persisted. He was put on A-V ECMO and HDF due to complete anuria secondary to hypotension- this treatment was also ineffective: hypotension and metabolic acidosis did not resolve. After re-assessment thiamine administration was proposed and it resulted in fast rise in blood pressure and possibility to reduce catecholamines. Fulminant form of Beriberi was diagnosed. The patient was soon successfully weaned from ECMO, but eventually died because of brain death.

**Conclusions:** Thiamine deficiency despite being relatively rare condition should always be considered as the cause of hyperglycemia with lactic acidosis, neurological symptoms, catecholamine resistant shock. As thiamine level is not measured routinely if patient is in the risk group the administration of thiamine is low risk, low-cost and can be life-saving.

**Keywords:** intensive care medicine, pediatric, catecholamine resistant shock, distributive shock, lactic acidosis, cardiac tamponade, thiamine, Beriberi.

## **DIFFICULT AIRWAY MANAGEMENT - VIDEOLARYNGOSCOPY AS A POSSIBLY EFFECTIVE METHOD OF INTUBATION IN PATIENTS WITH EPIGLOTTIS NEOPLASM**

Paweł Ratuski

**Scientific supervisor:** Hubert Kwapisz

First Department of Anaesthesiology and Intensive Care, Medical University of Warsaw, Poland

**Background:** Recognition of a patient with possibly difficult intubation before the surgery is crucial, to provide maximum safety. In advance preparation allows the anesthesiologist to choose the best method of intubation. It also helps to avoid unexpected „can't intubate, can't ventilate” (CICV) situation. There are a couple of scales like Mallampati's score, Cormack-Lehane's scale, Intubation Difficulty Scale (IDS), and more, that can be valuable in decision making process. Furthermore, there are many ways of intubation patient such as direct laryngoscopy, videolaryngoscopy, usage of bougie guideway or, fiberoptic and awake methods. The anaesthesiologist decide which one is the best for patient accordingly to own experience.

**Case Report:** 55 year old women was scheduled for shoulder joint arthroscopy. She presented history of difficult breathing for 3 years, and snoring for 3 months. As a result, she was referred to the laryngologist to exclude eventual pathological obstacles. The doctor who was examining the patient did not notice anything suspicious. In the operating room before induction, a resident of anaesthesia performed analgo-sedation with 1mg of midazolam and an USG-controlled interscalene brachial plexus block with 15ml solution of 2% xylocaine, epinephrine and bupivacaine under USG guidance. Subsequently, intravenous 200mg of propofol, and 100ug of fentanyl, were administered. In direct laryngoscopy the doctor spotted a neoplastic mass on the epiglottis which was occluding the vocal cords. Thereafter the patient developed a laryngospasm, which was treated with 100mg of corhydrone. Since it was not possible to intubate the patient and usage of a with valve bag mask was difficult, anaesthesiologist decided to use AirTraq videolaryngoscope which was successful at first attempt. After the surgery patient went home with no further complications.

**Conclusions:** Videolaryngoscopy might occur useful in patient with neoplastic proliferation on the epiglottis and could be life-saving in a CICV situation.

**Keywords:** intubation, difficult airways, CICV, videolaryngoscopy.

## **RECURRENT CEREBRAL STROKES OCCURED AT THE PATIENT WITH A POST-INFARCTION ANEURYSM AND TWO THROMBUS OF LEFT VENTRICLE OF HEART - CASE REPORT**

Martyna Stefaniak, Piotr Dzikowski, Gabriela Ręka, Wojciech Wokurka, Anna Przysucha

**Scientific supervisor:** Marek Prasał MD PhD,

Bartosz Kijewski MD

Chair and Department of Cardiology, Medical University of Lublin, Poland

**Background:** Presence of thrombus in left ventricle of heart is associated with high risk of systemic embolism, which may cause cerebral strokes and intestinal or limb ischemia. Thrombus can disappear independently, require antithrombotic therapy or in some cases surgical operation. The aim of work is presenting a patient's medical history, causes of thrombus formation in left ventricle and procedures in case of thrombus in heart.

**Case Report:** This work present a case of 61 years old male with a post-infarction aneurysm of left ventricle of heart and two thrombus of left ventricle, who suffered four cerebral strokes in embolic mechanism, thrombus of popliteal artery and is being treated for hypertension, type 2 diabetes and lipid disorders. Patient was admitted to cardiology clinic in august of 2019 in order to qualify him for surgical treatment. Coronary angiography revealed closure of left descending coronary artery in proximal section, while in echocardiography ejection fraction of left ventricle was found out on level of 30-35%. Neurological examination showed deep binocular amblyopia, central damage of facial nerve on the left side and hemiparesis of left side of body. Due to high risk of aneurismectomy patient was classified to conservative treatment. His previous antithrombotic therapy has been changed from NOAC to VKA. After receiving therapeutic values of INR patient was sign out to outpatient care.

**Conclusions:** Thrombus of left ventricle often accompany with dilated cardiomyopathy, aneurysm of left ventricle and myocardial infarction. Factors related with creation of thrombus are apex akinesia, developing aneurysm, bad heart contractility especially with reduced heart ejection fraction. Thrombus may back down by itself without antithrombotic therapy, however use of it is associated with higher frequency of clot dissolution and lower risk of systemic embolism.

**Keywords:** post-infarction aneurysm, thrombus of left ventricle, recurrent cerebral strokes.

## **ATYPICAL CASE OF FULMINANT HEPATIC FAILURE IN A MALNOURISHED PATIENT WITH CROHN'S DISEASE**

Agata Matras, Mikołaj Margas, Maria Kowalczyk

**Scientific supervisor:** Dr. Assoc. Prof. Przemysław Matras

Chair and Department of General and Transplant and Nutritional Treatment, Medical University of Lublin, Poland

**Background:** Fulminant hepatic failure is a sudden and rapid worsening of liver function in patients who have not previously had chronic liver disease. It is most commonly associated with viral infections, including hepatitis B virus, hepatitis C virus, VZV, etc. HBV is the cause of > 50% of all cases of fulminant inflammation, and 30-40% of patients are co-infected with HDV. The fulminant hepatitis is the most serious complication of infection with the above viruses, mainly in young women. Other common causes that can lead to fulminant hepatic failure include the use of certain drugs, intoxication or shock. We present the case of the patient with the fulminant hepatitis of unknown etiology.

**Case Report:** A 35-year-old female patient was admitted on November 12th of 2018 to the General Surgery, Transplantation and Nutritional Treatment Clinic PSK4 in Lublin because of severe malnutrition. Analysis of medical history showed progressive liver dysfunction in the form of radiologically visible steatosis features. Moreover, the patient was previously diagnosed with Crohn's disease that was not biologically treatable. Parenteral nutrition was implemented during the stay. Hypoproteinemia, hypoalbuminemia, hypocalcemia and hypokalemia, as well as leukopenia and anemia were found in the laboratory admission of the patient, which was associated with severe malnutrition. After starting nutritional treatment, the patient's general condition began to deteriorate. Deterioration of liver function was manifested by a constant increase in transaminases and bilirubin what raised suspicion of fulminant hepatic failure. In the last few days of stay in the Clinic, signs of infection, severe diarrhea, anuria, major coagulation disorders, enlargement and fatty liver appeared. On November 27 there was a sudden increase in liver damage markers - Alanine Aminotransferases (651 U/L) and Aspartate (1345 U/L), and an increase in bilirubin to 20.1 mg/dL, despite hepatoprotective treatment with Hepa-Merz. Due to increasing shock and disturbances of consciousness, the patient was transferred to the ICU. She was intubated and connected to a respirator, as a consequence of increasing respiratory failure. After several hours of intensive care, the patient died.

**Conclusions:** A diagnosis of fulminant hepatitis of unknown etiology was made based on the clinical picture and additional tests. Fulminant hepatitis is a condition that is most commonly associated with viral infections, including hepatitis B virus, hepatitis C virus, VZV, etc. HBV is the cause of > 50% of all cases of fulminant inflammation, and 30-40% of patients are co-infected with HDV. The fulminant hepatitis is the most serious complication of infection with the above viruses, mainly in young women. In this case no markers or antibodies indicating hepatotropic virus infection were found. The most probable cause was drug-induced damage after biological treatment or hepatitis of unknown cause.

**Keywords:** parenteral nutrition, fulminant hepatic failure, Crohn disease.

## **PATIENT WITH DEXTROCARDIA, SITUS INVERSUS, ARTERIAL PULMONARY HYPERTENSION AND ASD TYPE 2- CASE REPORT**

Piotr Dzikowski, Martyna Stefaniak, Anna Przysucha, Wojciech Wokurka, Gabriela Ręka

**Scientific supervisor:** Marek Prasał MD PhD, Bartosz Kijewski MD

Chair and Department of Cardiology, Medical University of Lublin, Poland

**Background:** Dextrocardia is a rare congenital condition in which the apex of the heart is located on the right side of the body. There are two main types of dextrocardia: dextrocardia of embryonic arrest, which is known as isolated dextrocardia and dextrocardia situs inversus. The aim of the work is to present a patient's medical history and treatment.

**Case Report:** The work present a case of 77 years old patient with dextrocardia, arterial pulmonary hypertension, atrial septal defect type 2, chronic atrial fibrillation, situs inversus, diabetes type 2 and chronic kidney disease, who was treated with bosentan and anticoagulants. Furthermore, in a anamnesis have been confirmed respiratory infection, fatty liver, hypercholesterolemia, hyperuricemia, cholecystolithiasis, anemia and obesity. In October 2019 the patient was admitted to Cardiology Clinic to perform check-ups and received prescription medicines. General condition of the patient was good, without characteristic cardiac decompensation. Patient denied chest pain, dyspnea, fainting or hemoptysis. In electrocardiography has been registered an atrial fibrillation with frequency of 70/110 per minute, normogram and single additional ventricular excitations. Due to persistent pain of knees and the right shank, the patient stayed under care of Orthopedic Clinic, and took PRN painkillers. After being set for a next visit in a Cardiology Clinic and receiving medication recommendations the patient was signed out to outpatient care.

**Conclusions:** People with dextrocardia often do not have any medical problems from the disorder but they may be prone to bowel, esophageal, bronchial and cardiovascular disorders, such as double outlet right ventricle, endocardial cushion defect or pulmonary stenosis. Some cardiovascular and pulmonary disorders related to dextrocardia can be life-threatening if left unchecked, therefore, there is a need of early detection of pathology in case of prevention.

**Keywords:** dextrocardia, situs inversus, arterial pulmonary hypertension.



## A RARE ENTITY OF INFECTIOUS ENDOCARDITIS AND MULTIORGAN FAILURE - A CHICKEN AND EGG SITUATION

Aleksandra Hus

**Scientific supervisor:** Renata Głowczyńska, MD PhD, Prof. Grzegorz Opolski MD PhD

1st Department of Cardiology, Medical University of Warsaw, Poland

**Background:** Cautious consideration of major and minor Duke Criteria for Infective Endocarditis (IE) is crucial in patients with multiorgan dysfunction and acute comorbidities. A fever of unknown etiology and gram-negative blood culture should suggest an IE in patient with numerous clinical deviations. Although *P. mirabilis* is rare reason for IE it should not be neglected before blood culture sampling and broad-spectrum antibiotic therapy should be chosen. Treatment of IE is comprised in patients with hepatic and renal impairments. IE in patients with end-stage liver disease can be a complication of bacterial spontaneous peritonitis.

**Case Report:** 56-year-old man was admitted to the intensive care unit, because of the decompensation of end-stage liver disease. Patient's primary disease: alcoholic liver disease at abstinence period. Symptoms: poor cognitive contact (GCS 13), encephalopathy, anuria, fever 39 degrees, huge ascites, grey-yellowish skin. Examination done at the ICU: gram-negative blood culture: *Proteus mirabilis*, splenomegaly, portal hypertension with esophagus varices, thrombopenia. Liver therapy, adequate antibiotic treatment was introduced and basic life support with continuous monitoring was chosen as the best therapeutic option at that time. At the same moment, the patient needed multiple high-volume paracenteses, because anti-ascites drugs could not improve the patient's condition. As patient had become overhydrated and due to the increasing uremia and its symptoms, patient started hemodialysis courses. The whole hospitalization lasted 29 days. During that time, patient was diagnosed with features of past infection of endocardium on the aortic valve in echocardiography. Standard therapy against IE could not be administered, because of advanced liver and renal impairments.

**Conclusions:** The IE was diagnosed post factum. However, if more attention had been paid to the symptoms, the echocardiography would have been performed earlier. The patient presented most of the minor Duke Criteria for IE, i.e: glomerulonephritis could be a late manifestation of active IE, not a result of antibiotic administration as it was interpreted first. Other minor criteria like: skin color change or splenomegaly were also present, but they were considered to be related to the liver problem. The justification for late cardiologic diagnosis, was the infectious bacterium – *Proteus mirabilis* which is a rare reason for IE. The International Collaboration on Endocarditis reported non-HACEK Gram-negative bacteria in 49 of 2761 (1.8%) IE cases. A medical council, including specialists involved in Endocarditis Team decided that patient cannot become a candidate for a liver transplantation.

**Keywords:** end-stage liver disease, alcoholic liver disease, infective endocarditis, *Proteus mirabilis*, non-HACEK gram-negative bacteria, Duke criteria, bacterial spontaneous peritonitis.

# **Doctoral students` session**

## **UPPER RESPIRATORY TRACT COLONIZATION BY GRAM-NEGATIVE RODS AMONG RESIDENTS AND PERSONNEL OF A NURSING HOME**

Martyna Kasela, Agnieszka Grzegorzczuk, Anna Malm

**Scientific supervisor:** Prof. Anna Malm

Department of Pharmaceutical Microbiology with the Laboratory of Microbiological Diagnostics, Medical University of Lublin, Poland

**Introduction:** Changes in the composition of the microbiota inhabiting the upper airways have been linked to many diseases ranging from viral and bacterial respiratory infections to immunity disorders. Older people deprived of the protective role of microbiota are considered to be more vulnerable for colonization and subsequent infection caused by potentially pathogenic bacteria, e.g. drug-resistant Gram-negative rods. We aimed at determining the prevalence of Gram-negative bacteria colonization of the upper respiratory tract of the residents and personnel in a nursing home located in Lublin (Poland).

**Methods:** Nasal and pharyngeal swabs were taken from 55 residents and 42 members of the personnel during winter and summer 2018. Isolates identification was conducted using the Vitek 2 Compact automated system.

**Results:** The percentage of colonization of Gram-negative rods during summer was higher both among the residents and the personnel (27.3% and 21.4%) than in winter (20% and 14.3%). We observed the simultaneous colonization of the throat and/or nasal cavity with different bacterial species. The most frequently isolated species were *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterobacter cloacae* and *Pseudomonas aeruginosa*.

**Conclusions:** The high percentage of the residents and personnel in a nursing home colonized with Gram-negative rods in upper respiratory tracts suggests the transmission of these microorganisms between them. Further studies are needed to determine the factors predisposing to colonization of the upper airways by Gram-negative rods both in the residents and personnel.

**Keywords:** Gram-negative rods, colonization, respiratory tract, elderly, nursing home.

## **INFLUENCE OF AESCUSAN ON THE INTENSITY OF BLOOD LIPID PEROXIDATION UNDER EXPERIMENTAL HYPOTHYROIDISM**

Olha Olenovych

**Scientific supervisor:** -

Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Ukraine

**Introduction:** Nowadays a great attention is paid to the question concerning lipid peroxidation processes, which can be considered both as adaptational body reaction and as universal mechanism of alteration of biostructures in case of pathology, including thyropathies. Pluripotent influence and universality of biologic effects of thyroid hormones determines the close connection between their level and the intensity of free radical oxidation, lipid and protein peroxidation processes – non-specific markers of the dysfunction of inner organs. The fact of influence of the thyroid status and the intensity of peroxidation processes on all metabolic processes in the body is undisputed. The investigation of blood lipid peroxidation processes in case of thyropathy will widen the possibilities of targeted pathogenic corrective influence on them at the stage of thyroid pathology development. Considering that, the aim of this study was to assess the intensity of blood lipid peroxidation processes in experimental hypothyroidism under the influence of Aescusan – horse chestnut seed extract preparations, known to demonstrate significant antioxidant properties as well as anti-inflammatory and anti-edematous effects.

**Methods:** For the experimental modeling of hypothyroidism 28 male rats were administered mercazolil intraperitoneally in a dose of 10 mg/kg. 14 days after that 18 hypothyroid rats and 10 animals of the control group were euthanized by decapitation, the rest 10 hypothyroid rats were administered Aescusan in the dose of 100 mg of alpha-aescinum/kg. The state of blood lipid peroxidation was assessed by quantification of malondialdehyde (MDA) and diene conjugates (DC), antioxidant protection – by the contents of superoxide dismutase (SOD), glutathione peroxidase (GPO) and ceruloplasmin (CP).

**Results:** As the results of investigation showed, MDA level in blood plasma of hypothyroidal rats was by 23,0% higher as compared with control parameters, DC contents, on the contrary, was found to be decreased by 26,3% despite the significant increase (by 96,2%) of SOD activity. At the same time, there was a 46,3% decrease of GPO activity and the level of plasma CP remained practically unchanged. MDA blood contents of hypothyroid rats was found to be 43,9 % decreased under the influence of natural antioxidant Aescusan, and was even 31,0% lower than the control values. Meanwhile, the level of DC increased by 21,8% and did not differ from that in control animals, the activity of SOD was twice decreased under the influence of Aescusan, tending to the control level. Aescusan improved GPO activity in blood plasma of hypothyroidal rats by 45,5%, but practically did not affect the activity of CP.

**Conclusions:** The obtained findings prove the attenuation of the second line of enzymatic antiradical protection since the activity of GPO and CT is aimed primarily at neutralizing hydrogen peroxide, which is formed in the dismutase reaction, participated by SOD. Insufficient antiradical capacity of the CP under hypothyroidism contributes to an increase in the plasma content of the secondary products of lipid peroxidation. Aescusan normalizes the intensity of lipid peroxidation processes in blood plasma of hypothyroid rats (decreases content of MDA and DC), optimizing prooxidant-antioxidant defense (balances the level of SOD and GPO).

**Keywords:** experimental hypothyroidism, lipid peroxidation, Aescusan.

## THE CO-OCCURRENCE OF TEMPOROMANDIBULAR DISORDERS AND CERVICAL SPINE DYSFUNCTION

Joanna Byra

**Scientific supervisor:** Prof. dr hab. Jolanta Jaworek

Faculty of Health Sciences, Jagiellonian University Medical College in Cracow, Poland

**Introduction:** The temporomandibular area is anatomically and functionally related with the cervical spine. The position of the jaw affects the mobility of the neck and posture of the upper torso by connecting it through the fascia and the muscles of the neck. In contrast, malocclusion leads to changes in the muscle tone of the neck flexor muscles, that in turn can cause myofascial dysfunction within the cervical spine. The aim of the study was to assess the co-occurrence of temporomandibular joint disorders (TMD) and cervical spine dysfunction.

**Methods:** The forty-eight patients ( $40.1 \pm 9.1$  years; 41 women, 7 men) were assessed by a questionnaire of Manual Functional Analysis of masticatory system (MFA) to diagnose signs and symptoms of TMD. The study group (N=48) was also examined for cervical spine dysfunction (pain, mobility). Neck movement ranges were examined using a CROM inclinometer and the assessment of neck pain in the Visual Analog Scale (VAS) and Laitinen Pain Scale was performed. Statistical processing of the data was done with STATISTICA 13 and was conducted considering significance at a p-value  $< 0.05$ .

**Results:** In the study group, 35 patients were identified who had temporomandibular disorders. Whereas the neck pain co-occurred with TMD in 52.1% of cases (N=25). In these patients, there was a limited mobility of the cervical spine in all directions. The severity of neck pain was average 6.1 points on VAS scale and 6.6 points on the Laitinen Pain Scale. There was a relationship between neck pain and temporomandibular joint disorders (Fisher's exact test  $p < 0.05$ ).

**Conclusions:** Cervical spine dysfunction may coexist with temporomandibular disorders. It seems important to examine patients with neck pain syndrome for signs and symptoms of temporomandibular disorders.

**Keywords:** temporomandibular disorders (TMD), neck pain, cervical spine.

## THE QUALITY OF LIFE IN PATIENTS WITH TEMPOROMANDIBULAR DYSFUNCTIONS

Joanna Byra

**Scientific supervisor:** Prof. dr hab. Jolanta Jaworek

Faculty of Health Sciences, Jagiellonian University Medical College in Cracow, Poland

**Introduction:** Temporomandibular disorders (TMD) are the second most common cause of chronic pain in the human musculoskeletal system. The triad of signs and symptoms includes: pain of temporomandibular joint (TMJ) and masticatory muscles, limitation of mobility, crepitation. The above symptoms lead to decreasing the quality of life, making impossible to perform basic life activities (food intake, verbal, emotional communication) and active participation in social life. Therefore, TMD become a social problem associated with high economic costs resulting from treatment and absence at work. The aim of the study is to determine the impact of temporomandibular disorders on the limitation of daily activities and quality of life in patients who are affected by these dysfunctions.

**Methods:** 35 patients ( $39.9 \pm 8.1$  years; 28 women, 7 men) with temporomandibular dysfunction were diagnosed according to the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD questionnaire). The axis II of RDC/TMD were used to assess quality of life and biopsychosocial background of temporomandibular joint dysfunction. In the study group the level of TMJ's pain on the Visual Analog Scale were also examined.

**Results:** Temporomandibular disorders reduced the following activities, i.e.: chewing food (41.9%), eating hard foods (59.6%), yawning (34.9%), verbal and non-verbal communication (44.5 %), social gatherings (33.5%), sport (64.5%), professional work (39.7%). In 69.3% of cases TMD were associated with headaches. Symptoms of depressed mood and depression (feeling of a decrease in energy, crying, poor appetite, feeling of loneliness, sadness, sleeping problems) concerned over 64.5% of respondents.

**Conclusions:** Patients with temporomandibular disorders often have a psychosomatic background of symptoms. Temporomandibular disorders can lead to reduced daily activities and quality of life. The incidence of the above signs and symptoms suggests the inclusion of psychological care in patients with the TMD problems.

**Keywords:** temporomandibular disorders (TMD), quality of life, activities of daily living.

## THE EFFECTIVENESS OF MANUAL THERAPY IN PATIENTS WITH NECK PAIN SYNDROME

Joanna Byra

**Scientific supervisor:** Prof. dr hab. Jolanta Jaworek

Faculty of Health Sciences, Jagiellonian University Medical College in Cracow, Poland

**Introduction:** The neck pain syndrome affects 60 to 90% of the population. Biomechanics and anatomy of the cervical spine predispose to overload and pain in this area. Neck dysfunctions lead to reduced mobility, pain and decreasing quality of life. Physiotherapy is one of the non-invasive intervention focused on reducing these symptoms. The purpose of this study was to assess the effectiveness of manual therapy in patients with neck pain syndrome.

**Methods:** The twenty-five patients ( $39 \pm 8.7$  years; 18 women and 7 men) diagnosed with neck pain syndrome underwent 3 weeks of rehabilitation, including manual therapy techniques i.e. fascial techniques, soft tissue therapy and cervical spine mobilization. In study group were performed following examination: 1) level of neck pain on the Visual Analog Scale and Laitinen Pain Scale, 2) neck range of motion using a CROM inclinometer 3) assessment of the limitation of daily activities by neck disability index questionnaire (NDI). Wilcoxon`s signed-rank test was used to examine the effects of the intervention on each outcome measure.

**Results:** The assessment of the effectiveness of 3-week rehabilitation presented improvement in all examined aspects. Pain was reduced from 6.1 points to 3.2 points on VAS and from 6.6 points to 2.4 points Laitinen Pain Scale. Improving the neck range of motion in all directions and decreasing of cervical disability rate from 22.3 points to 12.7 points in NDI were achieved. The results were statistically significant ( $p < 0.05$ ). In addition, there was no complications during the physiotherapy.

**Conclusions:** Manual therapy is an effective and safe method of rehabilitation in patients with neck pain syndrome. Physiotherapy helps to reduce pain, improve neck mobility and participation in daily life activities.

**Keywords:** cervical spine, neck pain, manual therapy, physiotherapy.

## **SHOULD WE LOOK FOR THE CD25 AND CD69 SURFACE MARKERS OF B AND T LYMPHOCYTES AT THE DIAGNOSIS OF CHRONIC LYMPHOCYTIC LEUKEMIA? A QUEST TO FIND A NEW PROGNOSTIC MARKER**

Michał Mielnik, Martyna Podgajna, Mateusz Mielnik

**Scientific supervisor:** Ewelina Grywalska, MD, PhD, Assoc. Prof.

Chair and Department of Clinical Immunology, Medical University of Lublin, Poland

**Introduction:** Chronic lymphocytic leukemia (CLL) is a condition characterized by the accumulation of morphologically mature monoclonal lymphocytes B with the CD19+/CD5+/CD23+ phenotype in lymphoid tissue, peripheral blood and bone marrow. The clinical course of patients with CLL is heterogeneous, ranging from indolent to aggressive. The role of lymphocyte activation in the natural history of CLL is still a matter of discussion. The aim of this study was to determine the percentages and absolute numbers of lymphocytes B and T in peripheral blood and bone marrow of CLL patients. Moreover, we analyzed the relationship between the number of CD25-positive and CD69-positive lymphocytes and the established prognostic factors in CLL.

**Methods:** The study included 80 untreated patients with CLL and 20 healthy subjects. The immunophenotype of peripheral blood mononuclear cells (in both groups) and bone marrow cells (solely in the CLL group) was determined by means of flow cytometry.

**Results:** Patients with CLL showed a higher absolute number of activated lymphocytes B with phenotypes CD19+CD25+ and CD19+CD69+, as well as a higher absolute number of CD3+CD25+ lymphocytes T than the controls. The enhanced activation of peripheral blood and bone marrow lymphocytes was associated with higher Rai stages, an increased concentration of lactate dehydrogenase and beta-2 microglobulin and the progression of the disease. The number of lymphocytes B CD19+ZAP-70+ correlated positively with the number of CD19+CD25+ B cells and CD3+CD69+ T cells.

**Conclusions:** The study confirmed the association between an unfavorable prognosis and a high expression of activation markers in CLL patients. The determination of CD25+ and CD69+ lymphocytes T and B constitutes a valuable diagnostic tool, completing the cytometric evaluation of CLL.

**Keywords:** flow cytometry, chronic lymphocytic leukemia, prognostic marker, lymphocyte count.



## **IN SEARCH OF A NEW PROGNOSTIC MARKER IN MULTIPLE MYELOMA – ANALYSIS OF THE OCCURRENCE OF LIMFOPENIA IN THE COURSE OF THALIDOMIDE, CYCLOPHOSPHAMIDE AND DEXAMETHASONE (CTD) CHEMOTHERAPY**

Michał Mielnik, Martyna Podgajna, Mateusz Mielnik, Kinga Kuśmierczuk, Aneta Szudy-Szczyrek

**Scientific supervisor:** Marek Hus, MD, PhD, Prof.

Department of Hematooncology and Bone Marrow Transplantation, Medical University of Lublin, Poland

**Introduction:** Lymphopenia is relatively frequent in the course of advanced malignant tumors. It is also a quite common complication of an anticancer treatment. It has been proven that both lymphopenia observed before and during chemotherapy is associated with poor prognosis of selected solid tumors and hematological malignancies. However, there is no data on the influence of lymphopenia on the clinical course of multiple myeloma (MM). The aim of the study was to determine the predictive and prognostic value of lymphopenia observed during CTD chemotherapy in patients with MM diagnosed de novo.

**Methods:** The study group consisted of 68 patients aged 39-87 (median 62) diagnosed with MM, treated with the first line triple drug CTD regimen (median of treatment cycles 6, range 1-12). The median follow-up was 27 months (range 2-130). The severity of lymphopenia was assessed according to the CTCAE criteria in version 4.03. The Kaplan-Meier estimation method and Cox logistic regression were used to assess the probability of survival and the occurrence of progression.

**Results:** Lymphopenia was found in 38 (55.9%) patients receiving CTD chemotherapy, including 13 (19.1%) in grade  $\geq 3$  (LIMF  $< 200/\text{mm}^3$ ). Patients with no decrease in lymphocyte counts or suffering from grade 1 lymphopenia during treatment achieved significantly (approximately 2 times) longer overall survival (OS) compared to patients with grade  $\geq 2$  lymphopenia (82 vs 38 months, HR = 0.44, 95% CI: 0.18-1.08,  $p = 0.0395$ ). However, no statistically significant differences were observed in the responses to treatment (OR = 4.59, 95% CI: 0.93-22.50,  $p = 0.0605$ ) and progression free survival (PFS) (15 vs 16 months, HR = 0.93, 95% CI: 0.51-0.69,  $p = 0.7986$ ).

**Conclusions:** Lymphopenia  $\geq 2$  degree according to CTCAE v4.03 observed during the first-line CTD chemotherapy in patients with MM is an independent, unfavorable prognostic factor.

**Keywords:** lymphopenia, multiple myeloma, CTD, chemotherapy, thalidomide, cyclophosphamide.

**THE ROLE OF MIRNAS IN THE BIOLOGY OF UTERINE LEIOMYOMAS**

Gabriela Sokołowska, Donata Ponikwicka-Tyszko, Michał Szamatowicz, Weronika Lebedzińska, Sławomir Wołczyński

**Scientific supervisor:** Prof. Sławomir Wołczyński

Department of Reproduction and Gynecological Endocrinology, Medical University of Białystok, Poland

**Introduction:** Uterine leiomyomas (ULs) are the most common benign gynecological tumors affecting 40 to 70% of women. Furthermore, ULs are the leading indication for hysterectomy worldwide. Due to poor understanding of their complex pathobiology no effective pharmacological treatment is currently available. Nowadays, ulipristal acetate (UA), selective progesterone receptor modulator (SPRM) seems to be the most promising agent in ULs treatment. Recently, it has been shown that small noncoding microRNAs (miRNAs) may regulate the ULs development and growth. However, more studies are necessary to examine the functional role of specific miRNAs in the pathobiology of ULs. Thus, the main goal of this study is to investigate the specific miRNAs expression profile and function to understand the biology of ULs and regulation of fibrosis, angiogenesis and chronic inflammation pathways.

**Methods:** In this study, we used few models: primary leiomyoma cells, leiomyoma explants and normal control myometrium cell cultures. All results derived from our in vitro models concerning miRNAs and genes/proteins were also directly confirmed in leiomyomas (n=150), leiomyomas from UA-treated patients (n=50) and normal myometrium (n=100; as a control group) tissues obtained retrospectively from women after surgery.

**Results:** The results of our study revealed that progesterone significantly stimulated, whereas UA at 1  $\mu$ M or higher doses inhibited leiomyoma cells growth and reversed the effects of progesterone. UA significantly decreased gene expression of Il-1beta, Il-24, Il-6, IGF-1, TGF-beta, FGF2 and VEGFC, but increased Il-10 gene expression in leiomyoma. UA decline IL-6, VEGF, TGF-beta and IGF-1 release in leiomyoma cells and explants. Expression level of miR-181a, miR-27a, miR-518 and miR-1291 was significantly decreased after UA treatment. Stimulation with UA, iTGF-beta and IL-6 downregulated, while VEGF upregulated miR-181a expression level.

**Conclusions:** Investigated miRNAs may be involved in ULs development and growth through regulation cytokines related to fibrosis, angiogenesis and chronic inflammation. More functional studies are crucial for understanding the mechanistic interplay between genes, miRNAs and downstream regulators in leiomyomas biology. The project was financed within the framework of the Polish Ministry of Science and Higher Education program "Strategy of Excellence-the University of Research" in the years 2018-2019 project no 0017/SDU/2018/18 the amount of funding PLN690 000.

**Keywords:** miRNA, leiomyoma, ulipristal, cytokines.

## **THE PERSPECTIVES OF MESENCHYMAL STEM CELLS IMPLEMENTATION IN REDUCING ALLERGIC AIRWAY INFLAMMATION DEVELOPMENT**

Marlena Tynecka, Aleksandra Starosz, Barbara Makowska, Arkadiusz Żbikowski, Kamil Grubczak

**Scientific supervisor:** Prof. Marcin Moniuszko, Dr Andrzej Eljaszewicz

1. Department of Regenerative Medicine and Immune Regulation, Medical University of Białystok, Poland
2. Department of Medical Biology, Medical University of Białystok, Poland

**Introduction:** Asthma represents one of the most common respiratory diseases affecting over 300 million humans and causes over 250 000 deaths worldwide. Currently, available treatments decrease symptoms and prevent exacerbations in the majority of patients. Unfortunately, high doses of inhaled corticosteroids result in long-term side effects and may induce resistance. Importantly, poorly controlled asthma leads to irreversible changes in the airway structure, referred to as airway remodeling. Therefore, there is a substantial need to develop novel therapeutic strategies improving treatment outcome in asthma patients, especially for patients that do not respond to applied treatment. Recently, stem cell-based therapies opened new possibilities in the management of inflammatory diseases and may represent a promising treatment option in uncontrolled asthma. Therefore, we aimed to evaluate the therapeutic potential of mesenchymal stem cells (MSCs) in an allergic asthma model.

**Methods:** MSCs were isolated from adipose tissue obtained after abdominoplasty. To analyze the therapeutic potential of isolated MSCs, we used HDM induced asthma model. Briefly, 10 $\mu$ g and 100 $\mu$ g of house dust mite extract (HDM) were applied i.n. for 2 weeks (5 days stimulation followed by two days resting) to induce airway inflammation with eosinophilic (Th2 related) and neutrophilic (non-Th2 related) phenotype, respectively. Saline treated mice served as a control of the study. MSCs were applied i.n. on day 6 or day 13. On day 14, all animals were sacrificed, and samples were collected for further analysis.

**Results:** First, we performed phenotypical and functional analysis of isolated MSCs. We found that obtained cells possess characteristic phenotype and function of MSCs. Next, we performed a validation of the protocol of HDM induced allergic lung inflammation. We observed that Th2 related and non-Th2 related lung inflammation might be induced by used lower (10 $\mu$ g) and higher (100 $\mu$ g) HDM doses, respectively. Finally, based on histochemical stainings, we found that i.n. MSCs administration may significantly reduce HDM induced lung inflammation.

**Conclusions:** In conclusion, our results suggest a high therapeutic potential of MSCs in the regulation of allergic airway inflammation. "The project was financed within the framework of the Polish Ministry of Science and Higher Education program "Strategy of Excellence - the University of Research" in the years 2018 - 2019 project no 0017/SDU/2018/18 the amount of funding PLN 690 000"

**Keywords:** asthma, allergic airway inflammation, mesenchymal stem cells.

# **General Surgery, Orthopaedics and Rehabilitation**

## THE STUDY OF THE FEATURES OF THE COURSE OF THE WOUND PROCESS IN PATIENTS WITH DIABETIC FOOT SYNDROME UNDER INFLUENCE OF NEGATIVE PRESSURE

Mohammad Shumayel Athar Khan Khan

**Scientific supervisor:** Dr. Assoc. Prof. Dmytro Fira

Department of General Surgery, Ternopil National Medical University, Ukraine

**Introduction:** According to the International Diabetes Federation (IDF), the number of patients on diabetes mellitus is now more than 415 million people on Earth, until 2030 it will increase to 439 million, and by 2035 - will reach 592 million. Throughout life, 4.6–25% of patients with diabetes mellitus develops a diabetic foot syndrome with the formation of wounds, whose treatment, can not yet be considered satisfactory, since in 15–25% of patients are the direct cause of high amputations of the lower limbs. This requires finding new effective methods for treating wound defects in patients with diabetic foot syndrome, one of which can be vacuum wound therapy.

**Methods:** The effect of vacuum therapy on the course of acute and chronic wound process in 84 patients with neuropathic and ischemic form of diabetic foot syndrome was studied during 2018–2019. Evaluation of the dynamics of the wound process was carried out on the basis of clinical, planimetric, microbiological, morphological methods, as well as microcirculation indices in the area round the wound.

**Results:** Vacuum therapy of acute and chronic wounds in patients with different pathogenetic forms of diabetic foot syndrome, allows to stabilize the course of wound process, stimulate regenerative processes in the wound, improve local microcirculation ( $p < 0.05$ ). This, in turn, allows a shorter time to prepare a wound for closure by one of the methods of plastic surgery or create favorable conditions for its independent epithelization. In patients with ischemic lesions (chronic arterial insufficiency of the third degree), the carrying out of vacuum therapy by standard method leads to an intensification of the pain syndrome. This causes the need to apply an initial negative pressure in the system in the range of 70–80 mm Hg, which makes it possible to stop pain during the day. At 2–3 days of the postoperative period, negative pressure is established at standard values.

**Conclusions:** Vacuum therapy of wounds in patients with diabetic foot syndrome is an effective method of treatment that allows the doctor to reduce the duration of treatment of patients in hospital with a neuropathic form of diabetic foot syndrome on average ( $4.1 \pm 1.2$ ) bed-days, and patients with ischemic form - on average ( $3.9 \pm 1.4$ ) bed-days, which has both medical and social significance.

**Keywords:** diabetes mellitus, diabetic foot, negative-pressure wound therapy.

## MORPHOLOGICAL AND PATHOLOGICAL ASSESSMENT OF SURGICAL TECHNIQUE ON THE FIDELITY OF INTESTINAL SUTURE LINE

Dr. Rahul Sethi, Dr. Assoc. Gayane Firdusi Avetisyan, Dr. Armen Abgarichi Muradyan

**Scientific supervisor:** -

Department of Topographical Anatomy and Operative Surgery, Yerevan State Medical University, Armenia

**Introduction:** Despite the improvement of traditional, as well as the development and implementation of modern methods of tissue connection in the formation of intestinal anastomoses, one of the most concerning issues in surgical gastroenterology remains the katzenjammer of intestinal sutures fidelity. The interrelatedness of tissues and restoring their integrity is one of the major goals in surgery. To date, many types of intestinal suture have been developed and proposed. However, as it turned out, there is no perfect suture line, all of them, in varying degrees, have complications. The most trivial and contemplative issue which often tampers the constitution of surgical intervention is the failure of intestinal sutures. Surgeons, researchers and pathologists continue to study the influence of the type of suture and suture materials on the nature of the healing of wounds of the intestine, morphological changes and the state of the microvasculature in the area of the suture given. The purpose of our experimental study was to study the effect of surgical techniques (the type of suture and nature of suture material) on histopathological processes and changes occurring in the area of the suture given, and their morphological evaluation.

**Methods:** The study was carried out on 72 anastomoses formed on 36 experimental rabbits. The abdominal cavity was opened by a midline incision. The loops of the small intestine resected and end-to-end anastomosis was performed with a single-row suture and two-row suture anastomoses were formed side to side. The abdominal cavity was opened with a new incision. In the clinical setting, 16 gastro-entero, entero-entero, colo-colo, cholecysto-entero-anastomoses were formed by unidirectional single-row nodal precision suture using the PDS II thread. 3 types of the suture were used with various combinations of suture material: 1) Traditional double-row line by catgut silk. 2) Single row sero-musculo-submucosal suture by Vicryl. 3) Unidirectional single-row knot with PDS-2.

**Results:** The specimen was taken at 1, 3, 7 and 21 days after surgery. No data collected on Day-1 due to the apparent prevalence of alternative processes in the first postoperative day. On 3rd day, the anastomosis formed by a single-row suture - epithelium onto the connective tissue of the intestinal villi, haemolysed erythrocytes with neutrophils, bunch of collagen fibres seen and muscle cell movement was high. On 7th day, the specific volume (SV) occupied by the necrotic tissues in the material decreased and amounted to 57.1-62.1% on the anastomosis with a double-row suture, and SV of the scar was increased to 22.4-28.3%. The SV occupied by necrotic tissues in the material on the 21st day of anastomosis by a unidirectional single-row suture decreased to 26.0-33.2%, and SV of scar increased and averaged 47.1-51, 0% (for comparison, in the tissues of the anastomosis imposed by a single-row suture, the corresponding values were 42.4-45.4% and 30.7-41.2%). Change in SV of necrotic tissue (VN) and SV of scar connective tissue (VS) in the rabbit small intestine wall with PDS-II was with  $p \leq 0, 05$ .

**Conclusions:** PDS monofilament single layer unidirectional sutures for intestinal anastomoses showed fast regeneration, no leakage in post-operative stage at suture line.

**Keywords:** intestinal suture, fidelity, morphological, histopathological, single row, double row, specific volumes of necrotic and granulation tissues, suture material.

## **ACUTE ABDOMEN AS ONE OF THE MOST COMMON REASON FOR EMERGENCY SURGERY IN GERIATRIC POPULATION – AGE AND SEX DIFFERENCES**

Weronika Lebowa

**Scientific supervisor:** Jakub Kenig, MD, PhD, Assoc. Prof.

Department of General, Oncologic and Geriatric Surgery, Jagiellonian University Medical College in Cracow, Poland

**Introduction:** Acute abdomen is one of the most common reasons for emergency hospitalizations in surgical wards. Due to the aging of the population the number of elderly undergoing emergency surgeries is expected to increase. The aim of the study was to analyse the indications for emergency abdominal surgery in patients aged  $\geq 65$  admitted to the Department of General Surgery.

**Methods:** Consecutive patients aged  $\geq 65$ , who underwent emergency abdominal surgery within 48 hours after admission to the ward, were enrolled into the study. We found 12 categories of emergency surgery conditions. Patients were divided into three age groups (65-70 years, 71-84 years and  $\geq 85$  years) of which the frequency of particular reasons for hospitalization was compared.

**Results:** The study sample comprised 986 older patients (female: 57%, male: 43%) with a median age of 76 (from 65 to 102). 25.9% patients were 65-70 years, 57.0% were 71-84 years and 17.1% were  $\geq 85$  years. In the first and second age group the most frequent indications for surgery were: acute cholecystitis, non-malignant ileus, colorectal cancer complications and acute appendicitis. In the oldest age group ( $\geq 85$  years) the most common were colorectal cancer complications, acute cholecystitis, non-malignant ileus and complicated diverticulitis. In the women, the biggest differences in indications between age groups were colorectal cancer complications ( $p=0.025$ ) and peptic ulcer disease complications ( $p=0.005$ ); in the men, the biggest difference was seen for complicated diverticulitis ( $p=0.001$ ). The highest in-hospital mortality was reported for acute intestinal ischemia (57.1%), followed by pancreatic cancer complications (51.9%) and complicated peptic ulcer disease (44.8%).

**Conclusions:** The reasons for abdominal surgery in geriatric patients differ between age groups and while comparing men and women. The most common indications for emergency surgery in older patients were acute cholecystitis, complications of colorectal cancer and non-malignant ileus, which together represented 59.5% of all patients.

**Keywords:** acute abdomen, abdominal surgery, emergency surgery, geriatric patients.

## COMPARISON OF SURGICAL AND NON-SURGICAL PROCEDURES FOR WEIGHT-LOSS

Adrianna Gorecka, Bartłomiej Zaremba, Małgorzata Szyplowska, Adrian Kuś, Damian Bator

**Scientific supervisor:** PhD Halina Pieciewicz-Sczęsna

Student Research Circle at the Department of Epidemiology and Clinical Research Methodology, Medical University of Lublin, Poland

**Introduction:** Obesity is a medical condition in which one's body mass index exceeds  $30\text{kg/m}^2$ . According to the estimates, it is considered to be a leading cause of death nowadays. Given the fact that it increases the likelihood of other illnesses such as diabetes type 2 or cardiovascular problems, its treatment should be of great importance to both patients and doctors. The aim of my study was an evaluation of operative and non-operative interventions for weight-loss in adults.

**Methods:** Review of medical journal literature published on PubMed in the last 5 years.

**Results:** The BMI was lower in patients who underwent surgery than the non-surgery therapy. Moreover, the weight-loss was higher in the first group also after one and two years after treatment, while non-operative patients started increasing on weight after 6 months. At two years follow-up 83% of operative patients no longer required diabetes type 2 medication compared to those treated with conventional therapy (15%). On the other hand, several patients from the first group had complications due to the surgery, while representatives of the second group only suffered minor or none side effects.

**Conclusions:** The studies show that surgical treatment for weight loss in adults has better long-time effects than diet or exercises alone. However, as a surgical procedure, it can lead to more serious side effects, so it is mainly recommended for obese patients with additional diseases, such as type 2 diabetes, or with BMI over  $40\text{kg/m}^2$ , while other patients should be treated with conventional methods.

**Keywords:** obesity, bariatric surgery, sleeve gastrectomy.



## PANCREATIC NEUROENDOCRINE TUMOURS: DIAGNOSIS AND SURGICAL APPROACH

Rebeca Petrea, Calin-Cristian Costea, Anastasia Padureanu

**Scientific supervisor:** Prof. Eugen Tarcoveanu MD PhD, Lecturer Alin-Mihai Vasilescu MD PhD

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Introduction:** Pancreatic neuroendocrine tumours (PNETs) are uncommon neoplasms with an unpredictable biological behaviour that exhibit neuroendocrine phenotypes. Their management usually represents a real challenge even for an experienced surgeon.

**Methods:** We performed a retrospective study during the last 16 years in the First Surgical Clinic from "St. Spiridon" Emergency Clinical Hospital Iasi which included each and every patient who was diagnosed with pancreatic neuroendocrine tumours.

**Results:** There were 26 cases diagnosed with PNETs. We came across 13 insulinomas, 7 gastrinomas of which 2 were associated with other endocrine neoplasia (Wermer syndrome), 5 non-functioning endocrine pancreatic tumours and 1 case of ACTHoma. The male to female ratio was 7:19 and the mean age was  $41.93 \pm 2.48$  years (range 20-68 years). We identified several clinical syndromes such as hypoglycemia as part of the Whipple triad, Zollinger-Ellison with peptic ulcer(s) and complications (haemorrhage, perforation) and Cushing syndrome. The biological examination included biological markers (e.g. insulin, gastrin, cortisol). Both size and location of the tumours were revealed after performing an ultrasound exam, CT-scan, angiography, PET-scan, Octreoscan and intraoperative ultrasonography. The surgical procedures regarding insulinomas were: tumour resection – 6 cases, left splenopancreatectomies – 3 cases, left pancreatectomies with spleen preservation – 2 cases, pancreaticoduodenectomies – 2 cases. Four out of 5 gastrinomas encountered multiple ulcers which required several surgical interventions for haemorrhage and perforation with peritonitis. The patients suffering from Wermer syndrome also had complicated ulcers and parathyroid adenoma. Three cases of non-functioning PNETs located at the level of the pancreatic tail demanded splenopancreatectomy and left pancreatectomy with spleen preservation while the other 2 occupied the pancreatic head and required pancreaticoduodenectomy and Beger procedure.

**Conclusions:** PNETs represent rare tumours and their management is always challenging. It is necessary to recognize the clinical signs of the secreting tumours and to examine the patients carefully. Immunohistochemistry is mandatory for confirmation, appreciation of the tumour proliferation and biological behaviour, allowing us to use specific therapy. Aggressive surgical treatment is indicated even in advanced stages.

**Keywords:** pancreatic neuroendocrine tumours, insulinoma, gastrinoma, zollinger-ellison syndrome, wermer syndrome, pancreatectomy.

## 5 YEARS FOLLOW-UP AFTER SURGICAL TREATMENT OF CHRONIC RECTAL FISSURES

Iryna Kozlovska, Andriy Iftodiy

**Scientific supervisor:** Iftodiy Andriy Grigorovich

Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Ukraine

**Introduction:** There are over 40 treatments for chronic rectal fissures (CRF), but given the long-term results, they have some complications (15-47%). Aim: to investigate the long-term results of surgical treatment of CRF operated by our proposed method.

**Methods:** The results of the treatment of 92 patients with CRF during 2012-2016 was analyzed. The main group (MG) - (47 patients, 51,09%) – was operated in the developed method (patent No 91491). Fissure with hypertrophied anal papilla and sentinel pile was excised within intact tissue. Anoplasty was performed without connective tissue tension by means of mobilized skin flap of anoderm and mucous-submucous flap of the inferior ampullar portion of the rectum with their accurate adjacent and suturing by means of intraparietal suture. Anoplasty line was additionally strengthened to prevent its cutting. The comparison group (CG) (45patients, 48,91%) was operated by known methods. Patients were observed until 2019

**Results:** If compare results of 5-years of post-operative observation the efficacy in MG was significantly higher. CRF relapse in 3-5 years occurred 3.99 times more often in CG (4 patients (8.89%)) than in MG (1 patient (2.13%)), sphincter insufficiency was only in CG. In the MG, the total healing period of the wound was 28.37% less. The closure of the surgical wound in the transverse direction prevents the occurrence of postoperative strictures, which are found only in 3 patients (6.67%) of CG. Within 2 months after treatment in the MG, sphincterometry indices hardly differed from healthy human, and after 6 months the normal function of the anal sphincter in all patients was completely restored, unlike CG, where 4 (8.89%) patients had sphincter;s insufficiency and 1 (2.22%) - anal incontinence. The proposed method reduces the period of postoperative rehabilitation and significantly improves the quality of patients' life after surgical treatment.

**Conclusions:** The introduction of the proposed surgical method quickly restore the patients' disability, improve immediate and long-term results of treatment, reduce the number of postoperative complications, quickly restore the tone of the anal sphincter. Since this method provides a high level of social and working rehabilitation of patients, it can become the method of treatment choice for CRF.

**Keywords:** chronic rectal fissures, surgical treatment, anoplasty.

## **MENISCOFIBULAR LIGAMENT - IRRELEVANT OR IMPORTANT? SYSTEMATIC LITERATURE REVIEW**

Marcin Mostowy, Katarzyna Kwas, Piotr Błachut

**Scientific supervisor:** Prof UM, MD, PhD Marcin E. Domżański

Orthopedic and Trauma Department, Veteran's Memorial Teaching Hospital in Lodz, Medical University of Lodz, Poland

**Introduction:** Meniscomfibular ligament is relatively unknown anatomic structure of knee joint, located between fibular head and lateral meniscus body. The aim of the study was to review the anatomy, biomechanics, injury patterns and possible repair/ reconstruction outcomes.

**Methods:** A systematic review of databases: MEDLINE, Cochrane Central Register of Controlled Trials, Scopus and Web of Science was conducted with no time limits. Independent selection was performed by 3 authors, disagreements were resolved by consensus. Three review author extracted the data separately and afterwards the cross-check of extraction correctness was performed. In order to avoid reporting duplicate publications, three independent authors juxtaposed authors' names, sample sizes, outcomes and methodology.

**Results:** 6 papers concerning meniscomfibular ligament were identified: 2 cadaveric studies, 2 MRI anatomic studies, 1 case study and 1 observational study. In both reviewed cadaveric studies, meniscomfibular ligament was found in 100% cases. In first MRI study meniscomfibular ligament was found in 42.5% of cases and in up to 63% of cases, when fluid was present in posterolateral corner. In second MRI study it was found in 100% of cases. Important to mention, MRI resolution was 6 times higher in the second study. Meniscomfibular ligament was described to be 3.84mm wide, on an average. What is more, it was wider in knees with horizontal proximal tibiofibular joint. In the identified observational study, this type of proximal tibiofibular joint was described to be significantly associated with more common discoid lateral meniscus occurrence. Therefore authors suggested that patient-specific meniscomfibular ligament morphology may be one of factors determining high rate of lesions occurring in discoid lateral meniscus.

**Conclusions:** Meniscomfibular ligament is poorly-known, neglected structure of knee joint, but it may influence lateral knee biomechanics, especially in specific patients subgroups. Its morphology and function can be strictly associated with proximal tibiofibular joint characteristics.

**Keywords:** fibula, meniscus, anatomy, biomechanics.

## **EXPERIENCE WITH VAC-THERAPY IN TREATMENT OF CHRONIC LOWER LIMB ISCHEMIA**

Mykolya Amelin, Iryna Kozlovska , Alexander Kolotylo, Pavlo Amelin

**Scientific supervisor:** Kozlovska Iryna Mykhaylivna

Department of Surgery No2, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Ukraine

**Introduction:** Treatment of non-healing wounds for a long time requires continuous improvement and search for new technologies. The aim to improve the treatment of chronic wounds in patients with chronic limb ischemia (CLI) that don't heal over 4-5 weeks by the use of integrated VAC therapy.

**Methods:** 104 patients with CLI were examined and treated. In the treatment used VAC-therapy continuously negative pressure within 80-125 mmHg with preliminary treatment of octenisept gel and application of a sorbent with an antibiotic immobilized on it. Replacement bandages were performed every 4-5 days.

**Results:** Already after 5 days of treatment there was a significant increase in local blood flow of wounds from 31 to 54 mm Hg. ( $p < 0,05$ ) according to the transcutaneous oximetry. Laser dopplerometry showed an increase in tissue perfusion in the wound by 140-170% from the baseline of 5 days and by 220-240% after 10 days of VAC therapy. After complex VAC-therapy for the 5-th day of treatment the amount of microflora in the wound decreased to 102-104 CFU/g. The regenerative-inflammatory type of cytograms was dominated. At day 10 the microflora in the wound was absent, there was border epithelization and regenerative type of cytogram. The granulation tissue developed on average  $5,61 \pm 0,34$  days, which is more likely than the control group which were treated with standard methods ( $p < 0,05$ ). In control group, complete purification of wounds from purulent exudate and the appearance of granulations was observed not earlier than 8-10 days, and the number of microorganisms in the wound was 105-106 CFU/g, the cytograms were inflammatory type yet.

**Conclusions:** The application of VAC-therapy contributed to a significant increase in the local blood flow of the wound, accelerated decontamination of the tissues of the wound, early purification of the pathogenic microflora, fibrin layers and sections of necrosis, from the products of exudation and decomposition of tissues, the disappearance of local inflammatory reactions, reducing the area and depth of the wound, stimulates the growth of granulation wounds, accelerates regional epithelization. The proposed comprehensive method of VAC-therapy provides effective resorptive, antibacterial, anti-inflammatory, desensitizing and biostimulant effects on wound processes and significantly improves healing processes.

**Keywords:** VAC-therapy, chronic lower limb ischemia, non-healing wounds.

## **CURRENT MEDICAL, LEGAL AND BIOETHICAL PROBLEMS IN TRANSPLANTOLOGY**

Dominika Chrostowska, Maria I. Hryshchuk

**Scientific supervisor:** Prof. Maria I. Hryshchuk

Department of Human Anatomy, Ivano-Frankivsk National Medical University, Ukraine

**Introduction:** Transplantation as a specialized medical field is one of the youngest, yet it is an area of many medical, legal and bioethical problems. Despite the huge progress of medicine and techniques, we still face a lot of problems, also, ethical controversies and juridical aspects do not help in the development of transplantology. During my speech, I would like to talk about a few, to my mind, the most important topics. If it comes to strict medical side, I am going to focus on the newest tendencies in immunosuppression and immunization (what for should we vaccinate and what is the most appropriate moment to do so), I am going to mention the surgical problems about transplantations with children and laparoscopic transplantations of livers. Also, I would like to explain a new term of oncology transplantation. Ethical doubts are mainly about the property of a corpse and transplantation of a liver, because of alcoholic disease. Stagnation of an amount of donations kind of forces us to discuss potential change of an agreement system. It is also worth it to simplify the process of donating from nonrelated donors.

**Methods:** Find information in literature of different countries about transplantation. The research is based on study of sources and current scientific claims. Conclusions after 14th Congress of Polskie Towarzystwo Transplantacyjne (17-19.10.2019).

**Results:** The necessary things are extensive social education, improvement of surgical techniques, research about immunosuppression, adjusting the law regarding the current medical situation, explaining ethical controversies.

**Conclusions:** Transplantology is an important and needful specialization in health care in the world. Relations between medical, juridical and ethical aspects determine the number of donations. Without a strict co-operation between a few areas, there are no chances for its improvement. We have the best, reputed in the whole world specialists, we perform pioneer transplantations, long-lasting survival results are better and better, there are more and more campaigns which provoke social discussions, but unluckily it does not boost the amount of transplantations. The necessity of undertaking more effort, inputting multi-dimensional improvements seems to be one of the best options of a change for better.

**Keywords:** transplantology, transplantation, donation, ethics, law.

## **SEGMENTAL TESTICULAR INFARCTION – STUDY OF SYMPTOMS, DIAGNOSIS AND PATHOPHYSIOLOGY**

Olaf Pachciński, Jacek Baj, Alicja Forma, Tomasz Tęśny

**Scientific supervisor:** Dr n. med. Jacek Baj

Students Research Group at Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** Segmental testicular infarction (STI) is a rare condition, which occurs between the second and the fourth decade of life. However there are also cases of patients over their 50s. The most common manifestation of STI is painful, swollen and tender testicle, sometimes with concomitant fever and leukocytosis. Over 70% of STI present idiopathic background and the remaining 30% are caused by specified vasal, biochemical or inflammatory abnormalities. The pathological mechanism of STI involves the interruption of the blood flow in the end artery, which leads to segmental ischemia. Besides the idiopathic causes, STI might occur secondary to vasculitis, epididymitis, anemia and coagulation disorders. However, the pathophysiology of that process is still not completely understood.

**Methods:** The research is an overview of four case reports dealing with STI including the diagnostic criteria and clinical proceedings, applied treatment and further perspectives. They are available on PubMed platform and were published between 2006 and 2019.

**Results:** The studies present cases of patients, aged from 28 to 63, admitted to the emergency department with acute pain of the groin, testis or hypogastrium. The authors compared the use and results of diagnostic methods like scrotal color Doppler ultrasound (SCDU) or magnetic resonance imaging (MRI) applied in STI. The cases highlighted also the diseases which STI should be differentiated with and showed both the conservative and surgical treatment approaches, including testis-sparing surgery. The testicular markers are usually at normal range, except from lactate dehydrogenase (LDH), which might be slightly elevated. STI should be differentiated especially with testicular tumor and global testicular infarction, caused by torsion of the spermatic cord leading to hemorrhagic infarct. The authors emphasized the importance of correct diagnosis, which should be performed by several methods.

**Conclusions:** Despite the uncommonness of the segmental testicular infarction, it is significant to know the mechanism of STI, accompanying symptoms and available diagnosis. This knowledge enables doctors to treat the patient efficiently and evade orchidectomy, which is an extremity. The satisfactory information for the diagnosis can be provided by MRI and SCDU imaging, as well as the hematologic evaluation.

**Keywords:** segmental testicular infarction, testicular haemorrhage, testicular ichaemia, testicular pathologies, scrotal color Doppler ultrasound.

## **ASSESSMENT OF KNEE JOINT EFFICIENCY AFTER SURGERY FOR TRAUMATIC INTERNAL INJURIES.**

Wojciech Wokurka, Piotr Piech, Agata Węgrzyniak, Małgorzata Neścior-Piech, Paweł Obierzyński

**Scientific supervisor:** Gabriela Kuroska, MD

Human Anatomy Department, Medical University of Lublin, Poland

**Introduction:** Internal knee injuries include rupture of the cruciate ligament and meniscus damage. Injuries of this type occur most frequently in young, physically active people. Proper diagnosis and appropriate treatment determine the further quality of life of these patients. Long-term evaluation of the results of knee capacity depending on the damage and treatment undertaken allows better planning of treatment and predicting the consequences. The aim of this study was to compare treatment outcomes in patients with isolated rupture of ACL and with both ACL and menisci damages.

**Methods:** The study involved patients in the extensive age range from 19 to 59 years old. Two groups were distinguished - patients with only ACL damage were qualified to the first, to the other with ACL damage and the accompanying meniscus injury. The study was developed using a subjective KOOS knee efficiency assessment scale.

**Results:** The results of all measurements were statistically processed using the Chi2 test. In the KOOS questionnaire, the most favorable result for each parameter is 100 points. Parameters of this scale were assessed: pain, quality of life, other symptoms, undertaking daily activities and sports activities. The following KOOS results were obtained for patients with isolated ACL injury: 82.31; 63.59; 74.57; 86.61; 70.71. For patients with cruciate ligament and meniscus injuries: 84.37; 61.81; 74.09; 83,84; 65.56.

**Conclusions:** In three categories a statistically significant correlation was obtained: sport activity, daily activities, "other symptoms". Analysis of parameters such as pain and quality of life did not show statistical dependence.

**Keywords:** anterior cruciate ligament, ACL, KOOS, treatment outcomes.

# **Head and Neck Diseases, Dentistry**



## GENDER PECULIARITIES OF DISTRIBUTION OF ARTICULAR TEMPOROMANDIBULAR DISORDERS

Denys Shtybel, Ruslan Kulinchenko, Viktor Kukhta

**Scientific supervisor:** -

Department of Prosthetic dentistry, Danylo Halytsky Lviv National Medical University, Ukraine

**Introduction:** Structure analysis of temporomandibular disorders (TMD) is important to optimize differential diagnosing by determining the most common TMD, as a consequence apply timely treatment and prevention therapy (Magdalena A. Osiewicz et al. 2017). Authors indicate on gender peculiarities of TMD distribution with considerable prevalence of women compared to men (D. Manfredini et al., 2006). Plenty of studies are dedicated to the signs and symptoms of TMD, but the issue of the TMD structure isn't sufficiently covered. The aim of our study is to improve the diagnostics quality of articular TMD by determining gender peculiarities of their structure.

**Methods:** 701 patients with symptoms of TMD were referred to Dentistry center of Lviv National Medical University during the period 2015-2019. Diagnoses of various TMD were established by clinical examination and additional methods (orthopantomography, zonography, ultrasonography, cone-beam CT, MRI). Microsoft Excel was used to create electronic database of TMD patients and analyze it. The study group consisted only of patients diagnosed articular TMD.

**Results:** 619 persons had articular TMD constituting 88,30% among all patients. Strong prevalence of women (499 persons) over men (120) was revealed (ratio 4,16:1). In the study group 1255 various articular TMD were diagnosed (238 in males, 1017 in females). Disc displacements (internal disorders – ID) constitute 56,34±1,40%, synovitis – 16,41±1,05%, dislocations of condyle – 15,94±1,03%, inflammatory-degenerative disorders (IDD) – 11,31±0,89%. Disc displacement with reduction was observed in 67,19±1,33% among ID, without reduction – 32,81±1,33%. The distribution of articular disorders among male patients was following: ID – 57,56±3,22% (with reduction 81,02±3,35%, without reduction – 18,98±3,35%), mean age M=26, 46 years old (y.o.); dislocations – 21,01±2,80% ( M=22,34 y.o.), synovitis – 18,49±2,52% ( M=28,73 y.o.), IDD – 2,94±1,09% ( M=36,86 y.o.). Among female patients ID constitutes 56,05±1,56% (with reduction 63,86±2,01%, without reduction – 36,14±2,01%), mean age M=31,91 y.o.; synovitis – 15,93±1,15% ( M=34,04 y.o.), dislocations – 14,75±1,11% ( M=29,42 y.o.), IDD – 13,27±1,06% ( M=45,75 y.o.).

**Conclusions:** The determined structure of articular TMD indicates on the necessity of primary focusing of dentists on ID both in men and women, furthermore the course of ID in women is more severe. Due to the considerable difference in portions of IDD in men and women, the influence of gender on the development of mentioned diseases might be suggested.

**Keywords:** temporomandibular disorders, TMD, structure, gender peculiarities.

## CHANGES IN THE ORAL CAVITY IN THE COURSE OF ULCERATIVE COLITIS AND CROHN'S DISEASE - A REVIEW

Michael Chou

**Scientific supervisor:** Dr hab. n. med. M.Klichowska-Palonka

Dentistry Division, Medical University of Lublin, Poland

**Introduction:** Oral pathological changes may accompany bowel diseases such as Crohn's disease or ulcerative colitis. The aim of this study was description (based on articles) of the types and incidence of oral lesions in Crohn's disease and ulcerative colitis.

**Methods:** Databases Scopus, Pubmed, and Google Scholar were used for finding journals describing oral changes in patients suffer from ulcerative colitis and Crohn's disease.

**Results:** Patients with Crohn's disease present more oral clinical symptoms than patients with ulcerative colitis and these symptoms are more frequent in men than women. Of all the oral symptoms, the most common in both diseases is aphthous stomatitis. This manifestation is observed in about 10% of patients with ulcerative colitis and 25% of patients with Crohn's disease. Different pathological developments can be categorized into specific or non-specific manifestations. Specific oral manifestations of Crohn's disease are cobblestone appearance in the mucosa, granulomatous cheilitis, deep oral fissuring, and mucosal tags. Pyostomatitis vegetans is a manifestation that is more frequent in patients with ulcerative colitis.

Non-specific oral manifestations of ulcerative colitis and Crohn's disease are cheilitis angularis, dental caries, mucogingivitis, periodontitis, lichen planus, dysphagia, drymouth, halitosis, taste changes, and aphthous stomatitis.

**Conclusions:** Inflammatory bowel disease can manifest many oral symptoms and sometimes a patient can acquire more than one of them. These concurrent symptoms together can become painful, cosmetically displeasing, and an impediment for the patient's normal oral functions. A dentist does not possess the ability to diagnose or treat either ulcerative colitis or Crohn's disease, but with oral findings observed by the dentist and active communication with the gastrointestinal physician, the patient suffering from undiagnosed ulcerative colitis and Crohn's disease can greatly improve their overall standard of life.

**Keywords:** ulcerative colitis, Crohn disease, inflammatory bowel disease, oral manifestation.

## **SIGNS OF INFLAMMATORY - DEGENERATIVE DISORDERS OF TEMPOROMANDIBULAR JOINTS IN WOMEN**

Yuliia Stetska, Ruslan Kulinchenko, Anton Filipyski

**Scientific supervisor:** -

Department of Prosthetic dentistry, Danylo Halytsky Lviv National Medical University, Ukraine

**Introduction:** Arthritis involving the temporomandibular joints (TMJ) complicates 40 - 96% of cases of juvenile idiopathic arthritis, potentially leading to devastating changes to form and function (M. L. Stoll, C. H. Kau, P. D. Waite et al., 2018). The etiopathogenesis of osteoarthritis is complex, and it is associated with multiple risk factors. The condition progresses slowly through different phases with periods of remission and activity finally reaching the burnout phase (M. Kalladka et al., 2013). TMJ osteoarthritis is clinically characterized by female preponderance, with a female- to- male ratio of more than 2:1 (Wang XD et al., 2013). The authors emphasize on the necessity to enhance the diagnostic algorithms of TMJ inflammatory - degenerative disorders (IDD) (M. Bansal, 2016). Aim of the study: to improve timely detection of TMJ IDD by revealing the most common signs and symptoms.

**Methods:** During the period from 2015 till 2019, 103 female persons referred to the Dental Medical Center of Danylo Halytsky Lviv National Medical University had the course of TMJ IDD. Diagnoses of IDD were established by clinical examination and additional methods (ultrasonography, cone - beam computed tomography). 30 patients were included to the study group, other persons had the combination of IDD with other disorders and were separated. Database of subjective examination results of patients with IDD were created by Microsoft Excel and analysis of complaints and symptoms has been done.

**Results:** Among different complaints and signs of TMJ IDD the most common were identified. They are following: pain during chewing in TMJ area (73,33% among women with TMJ IDD), pain during mouth opening (63,33%), spontaneous pain in TMJ area (60,0%), limited mouth opening (56,66%), noise in the TMJ (53,33%). Convergent positions on related issues have been received by Kristensen M. (2017), Ferrazzo K. (2013) et al. In particular, patients with TMJ IDD have pain at mouth opening, different noises in the joints and limited jaw movement more often then other signs.

**Conclusions:** The highlighted complaints and signs of TMJ IDD contribute to assume timely the course of the disease.

**Keywords:** temporomandibular joint, inflammatory - degenerative disorders, signs, symptoms.

## **GLASS FIBERS OF DENTISTRY COMPOSITE FILLINGS IN COMPRESSION MECHANICAL STRENGTH TEST**

Emilia Klimek, Janusz Tarczydło, Karolina Jurek

**Scientific supervisor:** PhD. Bożena Tarczydło<sup>1</sup>, PhD Eng. Monika Ostapiuk,

PhD Hab. Barbara Tymczyzna-Borowicz

Scientific Society at the Department of Conservative Dentistry and Endodontics of the Medical University of Lublin, Poland;

Department of Materials Engineering, Faculty of Mechanics, Lublin University of Technology, Poland

**Introduction:** Composite materials are currently the most outstanding and most frequently used group of materials for filling cavities in teeth. The application of glass fibres as the materials transmitting the loads between tooth tissue and filling polymer is becoming increasingly popular. The present study undertakes the research and analysis of destruction of composite materials reinforced with glass fibres applied for dentistry fillings.

**Methods:** Two types of molar crowns phantoms made of two types composite materials have been used for the research. One phantom was made of Filtek z250 (3M) universal composite applied in layers and another phantom contained a central composite layer in the form of material reinforced with glass fibres - EverXPosterior (GC). The phantoms have been subjected to compressive strength tests on Shimadzu AG-X universal testing machine with the range of 20kN. Feed speed was equal to 2mm/min. Macroscopic analysis after compressive strength tests has been carried out by means of NIKON SMZ 1500 (Olympus) stereo microscope. However, microstructural analysis has been carried out by means of SEM NovaNanoSEM 450 (FEI) scanning microscope.

**Results:** Composite materials used for studies were characterized by satisfactorily high strength ratios because the fracture in case of Filtek z250 filling occurred at the maximum forces values of about 1300N. However, the phantom reinforced by means of glass fibres became destructed at the force of about 2000N. This phenomenon is additionally affected by glass fibres applied in central layer of the phantom within EverXPosterior structure.

**Conclusions:** After the analysis of compressive strength test it has been found that the both materials were characterized by correspondingly sufficient strength. The highest occlusal forces occur on molars and their estimated values are included within 580N. Both fillings are estimated about 1300-2000N.

**Keywords:** phantoms of teeth, compression test, EverX Posterior and Filtek z250.

## THE INFLUENCE OF RISK FACTORS ON OCCURANCE OF TINNITUS AMONG CALL CENTER EMPLOYEES AND CONTROL GROUP

Dovile Meidute, Vitalija Meščeriakova

**Scientific supervisor:** Dr Vaiva Mickevičiene

Vilnius University, Lithuania

**Introduction:** The problem of tinnitus is undervalued. Prevalence of tinnitus range from 10% to 49% for men and from 6% to 30% for women. However, people with light tinnitus do not seek for medical help. The aim was to evaluate tinnitus occurrence and how risk factors affect its prevalence in call center and control groups.

**Methods:** The questionnaire survey was held in January - March of 2019 for working in call centers (N=74) and control (N=74) groups. A specific online questionnaire was designed to cover three topics of interest: demographic factors, work related factors and tinnitus characteristics. The data received was processed using Microsoft Excel and SPSS 22.0 programs. The difference between two groups was considered significant when  $p < 0.05$ .

**Results:** Average age in both groups was not significantly different: respectively  $27.6 \pm 8,7$  vs.  $24 \pm 6,74$  years old; proportion of male/female: respectively 15/59 vs. 30/44. Working in call centers indicated having tinnitus at least once in their lives and more often than control group respondents - 52 (70,3%) vs. 47 (63,5%), though this difference was not significant ( $p=0,382$ ). Among these 52 target group respondents 18 (34,6%) indicated, that tinnitus occurred immediately after starting working in call center, 9 (17,3%) mentioned that before experienced tinnitus intensified and re-occurred. Risk factors are common among both groups : smoking: 36 vs. 15; alcohol drinking: 64 vs. 70; coffee drinking: 64 vs. 55; energy drinks consumption: 27 vs. 24; attendance of places with loud music: 70 vs. 66, use of headphones in leisure time: 65 vs. 66. Consumption of alcoholic beverages has connection with tinnitus occurrence ( $p=0,025$ ) and its permanent nature ( $p=0,037$ ) in target, and with tinnitus occurrence ( $p=0,039$ ) in control group. Consumption of energetic drinks is connected to longer tinnitus duration ( $p=0,018$ ) in target group and tinnitus occurrence ( $p=0,019$ ) in control group.

**Conclusions:** Respondents working in call centers experience tinnitus not more often than control group respondents, though to one third of target group respondents tinnitus occurred only after starting work in call center. Consumption of alcoholic beverages and energetic drinks influences occurrence of tinnitus.

**Keywords:** tinnitus, call center workers, risk factors.

## BIO-ENGINEERING PROSPECTS OF DENTAL THERAPY

Elina Sauka

**Scientific supervisor:** Agaphonova Olexandra Vitalyivna

Department of Physiology, Bukovinian State Medical University, Ukraine

**Introduction:** In connection with the increasing development of bio-engineering and the growing interest in its products, as much as technical cons of different non-biological methods of tooth reconstitution, many experiments have been done in the field of bioengineering cultivation of dental germ. The statistic shows an increasing number of studies on dental cultivation in recent years. That tells us that different methods of dental germ growing will get a practical use in the future.

**Methods:** Literature review of the next theses: DOI 10.1016/j.archoralbio.2014.02.014, DOI 10.1007/s12015-010-9155-0, DOI 10.1111/ipd.12057, DOI 10.14712/18059694.2017.82, DOI 10.4252/wjsc.v7.i2.399, DOI org/10.1371/journal.pone.0021531, DOI 10.17116/stomat201594265-68, DOI 10.17116/stomat20199803112.

**Results:** Tissue engineering of the tooth uses: living stem cells, materials that mimic the extracellular matrix (ECM) and molecules that induce tissue regeneration. Stem cells are isolated from tooth pulp, periodontal ligament, dental follicle, papilla, and milk teeth. Synthetic materials, such as polycaprolactone, bioactive glass and various composites, as well as biomaterials such as collagen, chitosan and hyaluronic acid, are used to produce ECM. As such tissue growth regulators, growth factors, genes and interfering RNAs are used. To reproduce the process of odontogenesis, tissue engineering uses the technologies of cell-tissue recombination, cell layers, cell compartmentalization and dental complexes. The technology of cell-tissue recombination consists of 5 stages: isolation of the tooth germ, the allocation of epithelial and mesenchymal cells from the tooth germ, combining both pools of cells and culturing, transfer of the cell-tissue construct in vivo or in vitro, transfer of the tooth germ to the tooth socket. The technology of cell layers triggers the invagination of a layer of epithelial cells into a mesenchymal layer. Cell layers attach well to tissues and have good survival after implantation. When using the cell compartmentalization method, two types of cells were introduced into the collagen drop so that the mesenchymal pool of cells surrounded the epithelial, simulating the compartmentalization of these cells at the “cap” stage of the natural development of the tooth. The idea of dental complex production technology was to grow a bioengineered complex containing a mature tooth, periodontal ligaments and alveolar bone, and then transfer the complex to the hole in the jaw.

**Conclusions:** There is no doubt that in the next decade regenerative dentistry will become an integral component in the treatment of many difficult to treat dental diseases. There are many reasons to believe that tissue engineering technologies will make it possible to produce the entire dental complex, consisting of a full-fledged tooth and periodontal, and to a large extent replace the existing methods of dental prosthetics. It is also important that the approaches developed in tissue engineering of the tooth can help the development of technologies for the regeneration of other organs and will affect the entire regenerative medicine.

**Keywords:** bio-engineering, tooth regeneration, regenerative dental therapy, bio-engineered tooth.

## **RECONSTRUCTION OF THE FREE SKIN-MUSCULOSKELETAL FLAP FROM THE ILIAC PLATE - THE CONDITION AFTER EXCISION OF THE MAXILLAR JUVENILE OSSIFYING FIBROMA. CASE REPORT**

Karol Mazur, Joanna Borowik, Jakub Łyczba, Monika Zaborek

**Scientific supervisor:** Dr hab. n. med. Piotr Trojanowski

Student Research Group of the Department of Otorhinolaryngology and Oncological Laryngology, Medical University of Lublin, Poland

**Background:** Operating procedures for head and neck cancer are often associated with necessity of resection of large volumes of tissue. This affects the general well-being of the patient associated with the appearance of the operated area. For the reconstruction of defects, microvascular grafts are used. The use of vascularized skin-musculoskeletal patches shortens the time of healing and tissue adhesion. Complex reconstruction techniques based on transplantation of free microvascular lobes allow for good aesthetic and functional results.

**Case Report:** We present the case of a 24-year-old woman who was admitted to the Department of Otolaryngology for the extension of diagnostics and surgery of a left maxillary sinus tumor. The patient's anxiety was aroused by the slowly growing tumor of the left cheek, which was accompanied by breathing disorders and a feeling of expansion. Initially, this suggested inflammation. Based on the clinical picture and the results of additional tests, juvenile ossifying fibroma was diagnosed. The patient was qualified for radical resection with simultaneous reconstruction using a skin-musculoskeletal graft from the iliac plate. The tumor was removed from the left maxillary sinus, left nasal passage, oral vestibule and alveolar process of the maxilla. The scope of surgery also included left cheek lymphadenectomy. At the same time, a flap was taken from the hip area, based on deep vessels surrounding the hip. End-to-end intraoral anastomosis in the cheek was performed. Circulation was restored and the graft was secured.

**Conclusions:** The introduction of free tissue transfer and other pedicled flaps has provided multiple options for the reconstructive surgeon. Reconstruction of defects after extensive head and neck tissue resection is part of the holistic approach to surgical treatment of the patient. Reconstructive techniques with the help of skin-musculoskeletal patches give excellent results, but require high precision and skills from an ENT specialist.

**Keywords:** head and neck, microsurgical free flaps, reconstructive surgery, iliac crest free flap.

## **FREE FLAP RECONSTRUCTION- CONDITION AFTER EXCISION OF MANDIBULAR SARCOMA. CASE REPORT**

Karol Mazur, Klara Gonet, Jakub Łyczba, Monika Zaborek, Joanna Borowik

**Scientific supervisor:** Dr hab. n. med. Piotr Trojanowski

Student Research Group of the Department of Otorhinolaryngology and Oncological Laryngology, Medical University of Lublin, Poland

**Background:** Sarcoma is a malignant neoplasma originating from connective tissue and accounts for 1% of cancers in adults. It is characterized by rapid destructive growth, tendency to recurrence and the ability to form metastases. The chance for ENT patients with this cancer is complete excision and free flap reconstructions.

**Case Report:** We present a case of a 30-year old woman with large sarcoma of mandible and bottom of oral cavity. The patient was admitted to Department of Otolaryngology and Laryngological Oncology in Lublin for surgical treatment. Onset of symptoms in March 2019 – a nodule on the gum. After clinical examinations and additional test operation plan was presented to the patient and included excision of the bottom of oral cavity, mandibular body, submandibular glands and reconstruction with a free skin-musculoskeletal flap from the hip. Revision of the wound was performed the day after surgery. Postoperative period was complicated by cutaneous necrosis and salivary fistula. Patient discharged home in good condition and with granulating chin wound.

**Conclusions:** Functional and aesthetic outcomes are generally adequate although it is crucial to discuss postoperative expectations with patients preoperatively. Given the feasibility of multiple flap reconstructions, the overall acceptable complication rates and outcomes, and the mortality benefit of clear surgical margins and eradication of malignant lymph nodes, larger resections should be pursued if necessary, followed by a multiple flap reconstruction. Multiple free flap reconstructions should be considered in cases of large defects involving multiple functional regions and tissue types, majority of which arise following resection of advanced malignancies.

**Keywords:** head and neck, microsurgical free flaps, reconstruction.



## **WOOD DUST EXPOSURE AND RISK OF PARANASAL SINUS CANCER DEVELOPMENT**

Alicja Ozga, Justyna Wójcik, Aleksandra Obuchowska, Arkadiusz Standyło, Karolina Obuchowska

**Scientific supervisor:** Dr hab. n. med. Piotr Trojanowski

Student Research Group at the Department of Otorhinolaryngology and Oncological Laryngology, Medical University of Lublin, Poland

**Introduction:** Carcinomas of the paranasal sinuses represent 0,16% of all malignant tumors and 3% among head and neck cancers. Two main histological types of sinus cancer are squamous-cell carcinoma and adenocarcinoma. The significant risk factors include exposure to wood dust, formaldehyde, nickel, chromium compounds and asbestos. There is also a correlation between the HPV virus, alcohol abuse and tobacco smoking and sinus cancer. Wood dust was classified by the International Agency for Research on Cancer (IARC) as a carcinogen factor. The greatest occupational exposure to wood dust occurs in furniture factories and joineries. The most dangerous is exposure to mixed dusts and other co-existing compounds - chemical compounds that are present in the wood naturally, preservative substances and moulds or bacteria.

**Methods:** Available literature and the latest guidelines were analyzed.

**Results:** Many clinical, control and epidemiological investigations conducted in factories demonstrated the relationship between the workers' exposure to wood dusts and frequency of paranasal sinus carcinoma occurrence. The exposition to wood dust from the wood of deciduous trees has the greatest influence on the risk of adenocarcinoma of paranasal sinuses development. Besides the cancerogenic influence, wood dusts have acrid, mutagenic and genotoxic effects. The analyses of DNA collected from the patients with paranasal sinuses cancer displayed mutations in k-ras and h-ras gene and TP-53 protein.

**Conclusions:** Various scientific researches show the significant relationship between the occupational exposure to wood dusts and chemical compounds and the occurrence of paranasal sinus adenocarcinoma. Due to the initial asymptomatic course and non-specific symptoms resembling inflammatory conditions, the recognition of the condition arises in advanced stadiums. For that reason, the prophylaxis and appropriate protection against the wood dust exposure in work places is crucial, as well as early diagnostics towards sinus carcinoma for people exposed.

**Keywords:** paranasal sinuses carcinoma, wood dust, carcinogens, occupational exposure.

## CYCLIN D1 G870AA POLYMORPHISM INCREASES CANCER RISK IN LARYNX

Magda Barańska

**Scientific supervisor:** Prof. Wioletta Pietruszewska, MD, PhD

Clinic of Otolaryngology, Head and Neck Oncology, Medical University of Lodz, Poland

**Introduction:** In the United States only, more than 12000 new cases of laryngeal cancer are estimated to appear in 2019, causing almost 4000 deaths. Despite advances in diagnosis and treatment, the 5-year survival rate has not improved significantly in recent years. As laryngeal cancer is molecular disease, one of the most frequent changes in LC and PLL is rearrangement of the 11q13 region, where is located Cyclin D1 gene - CCND1, which occurs in 16-38% of HNSCC. The common single nucleotide polymorphism (SNP) in the CCND1 gene, the G870A in the literature was associated with the risk of several malignancies. The aim of our study was to investigate whether common sequence variant of CCND1 gene may affect premalignant laryngeal lesions, their progression to cancer and laryngeal cancer predisposition and assess the presence of G870A polymorphic variants of CCND1 gene in investigated groups.

**Methods:** The research group consisted of 435 patients- 100 patients with premalignant laryngeal lesion, 101 patients with laryngeal cancer, 234 healthy control cases and 17 patients with progression to cancer during the 15 years observation period. RLFP procedure was performed, followed by statistical analysis.

**Results:** When compared all probes taken from the lesions to healthy controls, presence of A allele in the study group was significant. Presence of A allele increased genetic predisposition to LC about 3 times in univariate and multivariate analysis. The significant association between A allele presence and increased risk of premalignant lesions 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).

**Conclusions:** CCND1 G870A AA/AG genotype was associated with increased cancer risk in larynx. For patients with premalignant laryngeal lesion carrying mentioned genotype, often examination is strongly recommended, along with chemoprevention or surgical removal of the lesion.

**Keywords:** premalignant laryngeal lesions, laryngeal cancer, RLFP analysis, G870A allele.

## WHETHER CYCLIN D1 EXPRESSION CAN BE USEFUL IN PREDICTING THE SUSCEPTIBILITY AND OUTCOME IN PRECANCEROUS LARYNGEAL LESIONS AND LARYNGEAL CANCER?

Magdalena Kowalczyk

**Scientific supervisor:** Prof. Wioletta Pietruszewska, MD, PhD

Department of Otolaryngology, Head and Neck Oncology, Medical University of Lodz, Poland

**Introduction:** Neoplasia is characterized by abnormal regulation of the cell cycle. Cyclin D1 regulates G1-S phase transition and its overexpression is linked to the development and progression in various types of cancers. In our study, we examined whether Cyclin D1 expression can be useful in predicting the susceptibility and outcome in precancerous laryngeal lesions (PLL) and laryngeal cancer (LC).

**Methods:** 435 patients were enrolled, including 101 LC, 100 PLL and 234 healthy controls. Expression of Cyclin D1 was examined by immunohistochemistry. 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; Z-adjusted -5,43;  $p < 0,0001$ ). In PLL with progression, initially concentrations of Cyclin D1 were lower than in the cancer tissue during the follow-up period (median 26 (10-40) and 5 (1-10) respectively,  $p = 0,002$ ). Gradually increasing expression of Cyclin D1 from low-grade dysplasia (median 8-10%), through high-grade dysplasia (15%) to carcinoma (30%;  $p = 0,01$ ) was revealed. In univariate analysis high expression of Cyclin D1 (above the median) was an independent factor affecting the reduction of survival in LC. Cut-off value above 15% of Cyclin D1 index was made based on ROC curves and enabled to distinguish patients predisposing to earlier death from cancer (sensitivity:76, specificity:56, LR+ 1,73 LR- 0,43; AUC (95% CI) 0,65 (0,55-0,75);  $p = 0,002$ ). In multivariate Cox regression analysis ( $\chi^2 = 47,53$ ;  $p < 0,0001$ ) high expression of Cyclin D1 (above the median) also reduced 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;  $p = 0,01$ ). Then, based on the ROC curves, it was checked whether cut-off value above 15% changes the risk of earlier death from cancer. It appeared that high expression of Cyclin D1 increased the risk of death from cancer almost 3 times. (HR 2,47; 95% CI 1,16-5,25;  $p = 0,02$ ;  $\chi^2 = 48,29$ ;  $p < 0,0001$ )

**Conclusions:** Expression of Cyclin D1 seems to be a promising marker in surveillance of progression premalignant lesions to cancer in larynx. Furthermore, it could be used as a prognostic factor for survival in LC.

**Keywords:** premalignant laryngeal lesions (PLL), laryngeal cancer (LC), cyclin D1 protein, prognostic factor, marker, biomarker.

# **Internal Medicine**

**CASE SERIES ON PATIENTS WITH CVD**

Devansh Singh

**Scientific supervisor:** Dr.Ritesh Lal (M.B.B.S,MD)(INDIA) , Dr.Gulam Malik(M.B.B.S)(INDIA), Dr.Amjad Khan(M.B.B.S)(INDIA)

Dr.Alexander Kudryavstev ,(MD,PhD)(RUSSIA) , Dr.Vitaly Postoev (MD,PhD)(RUSSIA)

Northern State Medical University, Arkhangelsk, Russia

**Background:** ECG's/EKG's have been a great tool for the physician's in finding the pathology to diagnosis associated with normal heart physiology . ECG abnormalities may have mild to strong consequences as in cases with CVD and may even require interventional diagnosis in life threatening diseases.In the case series on CVD, the study took place in clinical settings in hospital Amritdhara ,Karnal ,Haryana ,India .during my 3rd year M.D. elective Aim-To study ECG's in patient's suffering from cardiovascular diseases. Objectives- 1)To critically assess ECG's in context with past medical history. 2)To study morphological changes associated with patients of CVD. 3)To make diagnosis of present medical condition in context with CVD.

**Case Report:** The first patient - 51yrs old woman , presented with classical case of Left Anterior Fascicular Block/ Left Anterior Hemiblock(abnormal condition with delayed conduction of left anterior fasicle in left ventricle) with Left Axis Deviation , ( age related) Before reading ecg , we have to bear 5points in mind – rate, rhythm,axis, morphology of p wave, qrs complex and st segment and last any av block Heart rate – 100[approx] -300/3, Rhythm- regular Axis- lead I – qR shows positive deflection Lead aVF – rS shows negative deflection Lead III – shows negative deflection [confirming left axis deviation] ,But why left anterior fascicular block – LAD – Between -45 to 90 degrees, qR complex in leads I and aVL ,rS complexes in leads II , III, aVF, prolonged R pear time >45 ms The second patient- 68yrs old woman presented with epigastric pain while eating (burning) , angina ,past history shows patient had cardiac surgery for bio prosthetic aortic valves , recent colour Doppler ecgo report shows – aortic wall thickened , mild sclerosis and mild MR IMPRESSION- degenerative bioprosthetic aortic valves. With moderate AR mld aortic seclrosis , aortic valve regurgitation with severe LV dysfunction Clinical findings from ecg- no LAD nor RAD deviation is found , left ventricular hypertrophy due to senile calcification (aortic stenosis) mitral regurgation validates for possible Left Atrial Enargment , deep qrs compls how left ventricular hypertrophy also shows wellen syndrome ,HR- 86 Aortic sclerosis is indeed a marker of coronary arthesclerosis The third patient - 52 year old male Rhythm- regular irregular HR– 80 , LAD deviation is caused due to inferior MI (IN 80% CASES OCCLUSION WITH RIGHT CORONARY ARTERY) Atrial flutter is seen (V1) Inferior myocardial infarction is seen II ,III,Avf , st depression in V5, V6 aVL, I .Inverted T wave (V2,V5,V6) Deep T wave seen in (V3,V4) Premature ventricular contraction seen validating flutter , pvc due to stenosis Inferior myocardial infarction due to thrombosis in right coronary artery fQRS is seen in II ,III ,aVF

**Conclusions:** The main motive of case series study was to educate medical students , physicians , nurses regarding different ECG's complication by analyzing abnormal morphology of ECG's and to bear in mind Risk factors like old age , hypertension , past medical history , diabetes associated with it and the importance of evidence based medicine in case series study

**Keywords:** CVD, ECG, MI, atrial flutter, LAFB, inferior MI , anterior MI , aortic sclerosis, left ventricular hypertrophy, aortic stenosis.

## THE EFFICACY AND SAFETY OF AMINOGLYCOSIDE ANTIBIOTICS IN TREATMENT OF INTRAABDOMINAL INFECTIONS

Lučka Šetinc, Aleksandar Zafirovski

**Scientific supervisor:** Prof. Dr. Bojana Beović, Dr. med.

doc. Tadeja Pintar

Department of Abdominal Surgery, Ljubljana University Medical Centre, Slovenia

**Introduction:** Aminoglycosides are used as empirical antibiotic treatment of intraabdominal infections which are caused by Gram negative bacteria and for which the treatment of choice is surgery. Aminoglycosides maintain good efficacy against these bacteria and reduce the need of prescribing fluoroquinolone, cephalosporin and carbapenem antibiotics which contribute to the development of resistant bacterial strains. In recent years several clinical trials and international guidelines have advised against the use of aminoglycosides owing largely to doubts about their effectiveness and to the concern for their known nephrotoxicity and ototoxicity.

**Methods:** In our study we aimed to prove whether aminoglycosides are appropriate agents in treatment of acute surgically managed intraabdominal infections. The hypotheses examined in the study are: (i) treatment with aminoglycosides is not associated with more postoperative complications, and (ii) treatment with aminoglycosides is not associated with a higher risk of impaired renal function. In our retrospective study we included clinical cases of patients with acute cholecystitis and acute appendicitis. We recorded demographic characteristics, comorbidities, clinical signs and symptoms, and the type of antibiotic and surgical treatment. The effect of independent variables on the occurrence of complications was calculated using Student's T-test and Fisher's precise test. The effect of aminoglycosides on the loss of kidney function was determined by means of a linear regression method.

**Results:** 578 patients were included in the study: 278 had acute cholecystitis and 300 had acute appendicitis. Univariate statistical analysis showed that the risk factors for postoperative complications in treating acute intraabdominal infections were: age over 76 years ( $p < 0,001$ ), diagnosis of 'acute calculous gangrenous cholecystitis' ( $p = 0,01303$ ), 'acute perforated appendicitis' ( $p = 0,03573$ ) and 'appendicitis with periappendiceal infection' ( $p = 0,01253$ ), the presence of cardiovascular ( $p < 0,001$ ), pulmonary ( $p = 0,00339$ ), and kidney ( $p < 0,001$ ) diseases, and an achieved ASA group of IV ( $p < 0,001$ ). Treatment with aminoglycosides did not influence the occurrence of post-operative complications ( $p = 0,3135$ ). Multivariate statistical analysis showed that aminoglycosides did not have a statistically significant effect on the decrease of glomerular filtration rate.

**Conclusions:** Aminoglycoside antibiotics are a safe and effective treatment of intraabdominal infections which require surgery. If used for a limited time period they do not increase the risk for kidney injury.

**Keywords:** aminoglycoside, antibiotic, intraabdominal infection, sepsis, bacterial resistance, nephrotoxicity, ototoxicity, appendicitis, cholecystitis.

## UTILITY OF SALIVARY CORTISOL MEASUREMENTS IN THE DIAGNOSIS OF GLUCOCORTICOID RELATED DISORDERS

Sebastian Szewczyk, Katarzyna Pelewicz, Gabriela Bluszcz, Piotr Miśkiewicz

**Scientific supervisor:** Dr hab. n. med. Piotr Miśkiewicz

Department of Internal Medicine and Endocrinology, Medical University of Warsaw, Poland

**Introduction:** Systemic steroid therapy leads to reduction of endogenous cortisol secretion. Saliva as a diagnostic tool is patient friendly and possible to obtain by a non-invasive procedure. In comparison to total plasma cortisol, salivary cortisol is thus independent of changes in concentrations of binding proteins, such as CBG (corticosteroid-binding globulin) and albumin. DHEAS (dehydroepiandrosterone sulfate) levels that are well below the lower limit of normal for age and sex are a useful initial sign of iatrogenic adrenal disorders.

**Methods:** 14 patients (11 females and 3 males), represented active and moderate-to-severe Graves orbitopathy (GO), was treated by administration of intravenous methylprednisolone (IVMP) pulses in accordance with the EUGOGO protocol (500 mg MP once a week for six weeks, then 250 mg once a week for another six weeks — cumulative dose 4.5 g). After the 12 pulses treatment, the patient received three-months oral prednisone therapy. Results are expressed as means with range for parametric data, and as median with range for nonparametric data. Parametric data were analysed using paired t test and nonparametric data using Wilcoxon signed rank test.

**Results:** There was statistically significant ( $p < 0,05$ ) decrease of total serum cortisol (TSC) after the oral prednisone therapy. The reduction of salivary cortisol (SC) level before the IVMP therapy and after the treatment was not statistically significant, but we observed relevant decline after the oral prednisone therapy. ( $p < 0,01$ ). According to the statistics, there were the statistically significant decrease of DHEA-S between first and last pulse of methylprednisolone IVMP ( $p < 0,05$ ) as well as before the treatment and after three-month prednisone therapy ( $p < 0,001$ ).

**Conclusions:** Loss of SC is related with decrease of TSC level in the blood. In conjunction with DHEA-S blood level it may be a cost efficient, less invasive and enough sensitive alternative for TSC in diagnosis of adrenal diseases after glucocorticosteroid therapy.

**Keywords:** adrenal disorders, Graves ophthalmopathy, glucocorticoids therapy, salivary cortisol.

## **EFFECT OF CONTINUOUS POSITIVE AIRWAY PRESSURE TREATMENT FOR DEPRESSION AND ANXIETY AMONG PATIENTS WITH SLEEP APNEA**

Kotryna Liberyte

**Scientific supervisor:** Dr. Domantas Galkauskas

Center of Pulmonology and Allergology of Vilnius University Hospital Santaros Klinikos, Vilnius University, Lithuania

**Introduction:** Obstructive Sleep Apnea Syndrome (OMAS) is the most common respiratory sleep disorder which is associated with increased mortality and reduced quality of life. The aim of this research is to evaluate and compare the prevalence of anxiety and depression symptoms among the patients with obstructive sleep apnea syndrome before and after the continuous positive airway pressure treatment.

**Methods:** 2015-2019 a prospective study using the Clinical Anxiety and Depression Scale (HADS) at the Centre of Pulmonology and Allergology of Vilnius University Hospital Santaros Clinics was performed. Increased anxiety has been determined by collecting > 10 points on the anxiety scale, increased depression by collecting > 10 points on the depression scale. The questionnaire was filled by patients diagnosed with OSA for the first time. The change of anxiety and depression symptoms was evaluated at repeat visits after 3 and 9 months, once again by completing the HADS questionnaire. The statistical significance is calculated from the chi square test. Data is considered statistically significant at  $p < 0,05$ .

**Results:** 138 newly diagnosed patients have completed the questionnaires. 103 (73,6%) men and 35 (25,4%) women, average age  $55,48 \pm 11,03$ . Depression symptoms were detected for 38 out of 138 (27,5%) newly diagnosed patients, anxiety symptoms - 36 out of 138 (26,1%). After 3 months, 60 patients arrived for the second visit. Depression symptoms were detected for 6 out of 60 (10%) patients, anxiety symptoms - 2 out of 60 (3,3%) patients. After 9 months, 33 patients arrived for the third visit. Depression symptoms were detected for 3 out of 33 patients (9,1%), anxiety symptoms - 2 out of 33 (6,1%) patients. The symptoms of depression and anxiety decreased statistically significantly with repeated visits ( $p < 0,05$ ).

**Conclusions:** Anxiety and depression symptoms are highly prevalent in patients with obstructive sleep apnea. Continuous positive airway pressure treatment helps to reduce depression and anxiety symptoms.

**Keywords:** anxiety, depression, obstructive sleep apnea, continuous positive airway pressure.



## **ELEVATED LEVEL OF MYELOID AND PLASMACYTOID DENDRITIC CELLS – NEW IMMUNOLOGICAL FOUND IN GRAVES-BASEDOW DISEASE**

Izabela Morawska, Sebastian Mertowski, Krzysztof Gosik, Adam Michalski

**Scientific supervisor:** Ewelina Grywalska MD, PhD, Assoc. Prof.

Department and Faculty of Clinical Immunology, Medical University of Lublin, Poland

**Introduction:** Graves-Basedow disease currently has been considered to be an autoimmune disorder in which stimulation by the antibodies produced against TSH receptor (TRAB) may lead to hyperthyroidism, thyroid orbitopathy, thyroid dermopathy and has been found as the most frequent cause of hyperthyroidism in the world. Pathogenesis is not yet fully understood, however it was believed that development is a consequence of imbalance between the formation of self reactive T cells and central and peripheral tolerance. Many studies confirmed an important role of dendritic cells (DC) in the development of hyperthyroidism, however the exact molecular mechanism remains unclear. The aim of this study was to assess the relationship between the percentages of DC expressing blood dendritic cell antigens BDCA-1 and BDCA-2 in patients with GD before and after the thyreostatic therapy and selected laboratory parameters.

**Methods:** The study involved 52 women, of which 32 were diagnosed with Graves-Basedow disease and 20 of them were healthy controls. Blood samples were collected from them and DC were obtained from peripheral blood. Immunophenotyping was performed using the fluorescently tagged antibodies and flow cytometry approach. Results were statically analyzed.

**Results:** The mean percentage values of BDCA-1 and BDCA-2 DC in patients with GD in comparison with healthy control were statistically significantly higher ( $p < 0.0001$  and  $p = 0.0067$ , respectively). After treatment both values decreased to the level found in control group ( $p < 0.0001$  and  $p = 0.0067$ , respectively).

**Conclusions:** Obtained results suggest the connection between the expression of DC's antigens and pathogenesis of GD.

**Keywords:** hyperthyroidism, dendritic cells, Graves-Basedow disease, blood dendritic cell antigens.

## COMORBIDITY OF OSTEODEFICIENCY WITH GASTROINTESTINAL DISORDERS RELATED WITH PATIENTS' AGE AND GENDER

Anna Komar, Iryna Shepet

**Scientific supervisor:** Dr. Assoc. Prof. T. Boiko, PhD

Department of Internal Medicine, I. Horbachevsky Ternopil National Medical University, Ukraine

**Introduction:** The subject of comorbid diseases is extremely relevant nowadays. Research statistics show that every fourth inhabitant of our planet has disease of the digestive tract and hepatobiliary system. Special attention should be paid to inflammatory disorders of the digestive system, which can become a trigger for the development of secondary osteoporosis. According to V. Povorozhuk about 3% of the Ukrainian population suffers from derivative osteoporosis. This disease is the cause of estimated hundreds of fractures annually. All these outcomes impair the quality of life of people and often leads to complete disability. The aim of this research was to investigate the effect of combined pathology of the gastro-duodeno-pancreatic zone and the liver, the development of changes in the mineral density of the bone tissue, considering the age and gender characteristics by retrospective analysis of the patients case histories.

**Methods:** Fifty-six case histories of patients with combined pathology of the gastro-duodeno-pancreatic region and the liver have been processed, along with 20 practically healthy people. There were 36 (51, 4%) men and 34 (48.6%) women. The age of patients ranged from 20 to 73 years, the average age was  $(43.54 \pm 1.25)$  years. A two-photon X-ray densitometer (DEXA) for the axial skeleton of the company Lunar (USA) was used to evaluate the bone mineral density. The received digital data was processed by the method of variation statistics and correlation analysis.

**Results:** It was proved that the incidence of osteodeficiency in patients with chronic gastroduodenitis, pancreatitis and hepatitis is 88.8% (osteopenia – 56.5%, osteoporosis – 32.3%); chronic gastroduodenitis and pancreatitis – 72.7% (osteopathy – 52.3%, osteoporosis – 20.4%); chronic gastroduodenitis – 60.0% (osteopenia). Unidirectional changes in bone mineral density (osteodeficiency) of vertebrae and femur ( $p < 0.05$ ) were revealed.

**Conclusions:** We approved that osteodeficiency level in the examined patients depends on their age, gender, disease duration, nosological form and menopause in women. These vitally important questions raise doctors' concern about the problem of osteogenic conditions and encourage the development of modern and effective methods for the prevention and treatment of such complications.

**Keywords:** comorbidity, gastroduodenitis, pancreatitis, hepatitis, osteopenia, osteodeficiency, osteoporosis, bone density, densitometer.

## **THE CORRELATION OF PD-1/PD-L1 SIGNALLING PATHWAY AND EPSTEIN-BARR VIRUS COINFECTION IN PATIENTS SUFFERING FROM CHRONIC LYMPHOCYTIC LEUKEMIA**

Martyna Podgajna, Michał Mielnik, Mateusz Mielnik

**Scientific supervisor:** Ewelina Grywalska MD, PhD, Assoc. Prof.

Chair and Department of Clinical Immunology, Medical University of Lublin, Poland

**Introduction:** Viral pathogens play significant role in many cancers, including haematological ones. Infection with Epstein-Bar virus (EBV) is associated with an unfavorable prognosis in CLL, but the underlying mechanisms remain unknown. Herein we present a study aimed to establish whether EBV worsens the course of CLL by up-regulating the programmed cell death 1 (PD-1) signalling pathway.

**Methods:** Polymerase chain reaction was used to measure EBV DNA in the blood of 110 newly diagnosed, treatment-naive patients with CLL. The expression of PD-1 and programmed cell death protein 1 ligand (PD-L1) on CD4+, CD8+, and CD19+ cells were assessed with flow cytometry. Additionally, PD-1 and PD-L1 serum concentrations were measured through enzyme-linked immunosorbent assays. We related the expressions of PD-1 and PD-L1 to EBV DNA load and clinical outcomes.

**Results:** Fifty-nine (54%) patients had detectable EBV DNA [EBV(+)], and these patients had more advanced disease at baseline than the rest. PD-1 and PD-L1 serum concentrations and their expressions on all cell populations were higher in EBV(+) than EBV(-) patients. EBV load correlated positively with unfavorable clinical markers of CLL and the expression of PD-1 and PD-L1 on CD4+ and CD8+ cells ( $\rho=0.42-0.75$ ;  $p<0.001$ ). EBV(+) patients had increased risks of treatment initiation and lymphocyte doubling during a median follow-up period of 32 months ( $p<0.001$ ). Among EBV(+), but not EBV(-), patients, higher expressions of PD-1 and PD-L1 on CD4+ and CD8+ cells were associated with higher risks of treatment initiation and lymphocyte doubling ( $p\leq 0.020$ ).

**Conclusions:** EBV-induced up-regulation of PD-1-PD-L1 signaling is associated with worse outcomes in CLL.

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## SKIN MICROBIOTA IN PSORIASIS - FRIEND OR FOE?

Danuta Krasowska

**Scientific supervisor:** Dr n. med Agnieszka Gerkowicz

Students' Scientific Association at the Chair and Department of Dermatology, Venerology and Pediatric Dermatology, Medical University of Lublin, Poland

**Introduction:** Psoriasis is a chronic inflammatory disorder of the skin that impacts 1-3% of the world's population, with the number of patients constantly increasing. It is one of the most commonly seen and treated disease by dermatologists. Skin lesions may affect different parts of the body ranging from limited papules to plaques that encompass vast portion of patients body. Psoriasis is a complex disease to manage, since there are many different factors affecting the development of disease. Even though many studies have revealed that genetics, disruption of immune system and excessive production of inflammatory factors play a role in pathogenesis of psoriasis, the exact mechanism still raises doubts. Microbiome perturbations have been associated with several immune-mediated diseases such as atopic dermatitis, asthma, and multiple sclerosis. Interestingly, the skin microbiota is hypothesized to play a role in the pathogenesis of psoriatic disease. The aim of the study was to review literature concerning the disruption of skin microbiome in psoriasis.

**Methods:** The systemic review was done using Medline database. Search was limited to human and English language, with no limits for date or publications type.

**Results:** Results suggest that microbial communities on psoriatic skin differ from those on healthy skin. The psoriatic skin microbiome has increased diversity and reduced stability compared to the healthy skin. Staphylococcus aureus was found to be more prominent in both psoriatic non-lesional and lesional skin while Staphylococcus epidermidis and Propionibacterium acnes were more abundant in healthy skin. The disruption of the microbiota in psoriasis indicates that Malassezia furfur drives type 17 immunity in the skin and therefore exacerbates the disease. Similarly Staphylococcus aureus demonstrated capacity toward Th 17 polarisation whereas Staphylococcus epidermidis demonstrated no such response . Moreover, changes in microbiome refer not only to the skin, but also to impaired gastrointestinal microbiome

**Conclusions:** The loss of community stability and decrease in immunoregulatory bacteria may lead to higher colonization with pathogenic bacteria, which could exacerbate skin inflammation along the Th17 axis. Therefore there is a need for modification of treatment strategies in patients with psoriasis.

**Keywords:** psoriasis, skin microbiome, microbiota.

# **Paediatrics and Neonatology**

## **WHAT'S THE MOST FREQUENT INDICATION TO PERFORM VOIDING CYSTOURETROGRAPHY IN CHILDREN? - ONE YEAR SINGLE CENTER EXPERIENCE.**

Paula Czado, Karolina Marczak, Mateusz Koperwas

**Scientific supervisor:** Prof. dr hab. n. med. Maria Szczepańska,

Dr hab. n. med. Piotr Adamczyk

Department of Pediatrics, Faculty of Medical Science in Zabrze, Medical University of Silesia in Katowice, Poland

**Introduction:** Voiding cystourethrography (VCUG) is a procedure that is used to assess the functional efficiency of the valvular mechanisms between ureter and the bladder. The indications to carry out VCUG are suspicion of structural anomalies in urinary bladder, bladder tumors, urethral injuries, disturbances in urine outflow, incontinence, preparation for kidney transplantation and diagnostics of congenital defects of the urinary tract. The aim of this study was to demonstrate the incidence of performing VCUG among children with suspicion of urinary tract defect and to find the most frequent diagnosis made using VCUG.

**Methods:** A retrospective study, including 175 children, was conducted from January 2018 to December 2018 in Pediatric Nephrology Clinic. The study group consisted of 110 girls (63%) and 65 boys (37%) aged from 2 months to 18 years (mean age  $48,9 \pm 48,6$  months), in whom VCUG was carried out in this period. Medical evaluation of patients included: gender, birth weight and height, age at the VCUG examination, the number of urinary tract infections (UTI) before voiding cystourethrography, occurrence or nonoccurrence of urinary system defects in family and pregnancy complication by mother's UTI. Imaging examinations of urinary tract such as VCUG and USG were assessed and gathered in our database.

**Results:** Three main reasons to carry out VCUG in this group were: recurrent urinary tract infections, suspicion of a defect in urinary system and incontinence. Only 51 (31%) among 165 conducted USG showed abnormalities in urinary system. Fifty two (30%) among conducted 175 VCUG were incorrect and revealed the occurrence of vesicoureteral reflux (VUR). Almost half (46%) out abnormal results show bilateral VUR; 19 (37%) out of them were IVth or Vth grade. Two kids (1,13%) were diagnosed with renal insufficiency. Mean estimated GFR was  $108, 85 \pm 32,7$  ml/min/1,72m<sup>2</sup>.

**Conclusions:** The qualification to VCUG should be carefully performed to minimize the number of unnecessary procedures. Diagnosis of VUR by VCUG enabled proper qualification to surgical treatment.

**Keywords:** VCUG. cystourethrography, vesicoureteral reflux, ureter, bladder.

## SEPSIS AS A COMPLICATION OF VARICELLA IN CHILDREN

Martyna Szewczyk, Klaudia Nowicka

**Scientific supervisor:** Dr n. med. Ewa Talarek

The Student Scientific Circle of the Department of Children's Infectious Diseases, Medical University of Warsaw, Poland

**Introduction:** Varicella (chickenpox) is a highly communicable disease which typically affects children 2-8 years of age. It is usually a mild disease, but can cause complications requiring hospitalization and in rare instances, can ever be fatal. The one of the most dangerous complications is sepsis. The aims of the study were to determine the incidence rate of hospitalization for patients with sepsis related to varicella and to describe these patients.

**Methods:** We analyzed medical records of children with sepsis related to varicella hospitalized in Department of Children`s Infectious Diseases, Medical University of Warsaw, from 01.01.2015 to 31.12.2017. The sepsis was diagnosed based on clinical symptoms and laboratory tests.

**Results:** Of the study period 473 children with varicella were hospitalized, in 8,2% of them (39; 17 boys and 22 girls) sepsis was diagnosed. The mean age was 3 years 6 months (range: 5 months - 10 years 9 months). None of those patients was immunocompromised. The duration of hospitalization ranged from 6 to 15 days (median 9 days). Admission occurred at different times after the first symptoms of varicella, ranging from 1 to 7 days (median 4 days). The household exposure to varicella was confirmed in 15 cases. Patients presented other complications (some of them more than one): bacterial skin infection (17 patients; 43,6%), scarlet fever (11 patients; 28%), pneumonia (3 patients; 7,7%), acute otitis media (4 patients; 10,3%) and purulent conjunctivitis (3 patients; 7,7%). The following laboratory results were obtained: CRP mean 111,7 mg/l (median 71 mg/l), PCT mean 18,02 ng/ml (median 4,83 ng/ml), WBC mean 13,7 K/ $\mu$ l (median 13,4 K/ $\mu$ l). Bacteremia was confirmed only in 7 cases (*S. pyogenes* and *S. hominis* in 3 cases respectively and *S.aureus* in 1 case). Among 17 patients with sepsis as a result of bacterial superinfection of varicella skin lesions a causative agent was identified in 8 cases ( *S. aureus* in 5 cases, *S. pyogenes* in 2 cases, *S. epidermidis* in 1 case) All 39 patients recovered.

**Conclusions:** Varicella may be severely complicated in otherwise healthy children. Sepsis related to varicella most commonly develops as a result of bacterial superinfection of skin lesions.

**Keywords:** varicella, complications, sepsis.

## **ANALYSIS OF DEEP VEIN THROMBOSIS REGARDING RISK FACTORS, LOCALIZATION AND SELECTED BLOOD PARAMETERS**

Dagmara Jabłońska, Ewelina Detka, Maciej Stawicki

**Scientific supervisor:** Małgorzata Sawicka-Żukowska

Department of Paediatric Oncology and Haematology, Medical University of Białystok, Poland

**Introduction:** Deep vein thrombosis (DVT) can occur during the whole life, but increased frequency of this disorder is observed nowadays among children in developmental age. It is mostly related with numerous factors, including congenital thrombophilia, as well as environmental factors which include sedentary lifestyle and absence of physical activity.

**Methods:** The study group consisted of 26 children (male: 16, 1-18 years, mean age  $13,1442 \pm 4,9955$ ) treated from DVT in the Department of Paediatric Oncology and Haematology. The assessment was based on medical histories of the patients. All patients received LMWH. Parameters taken into consideration were: age, localization of DVT, potential causes. In every patient blood parameters including D-dimers, platelets and evolution of these parameters during treatment were evaluated. Localization of DVT was appraised by Doppler USG. All of the laboratory determinations were performed with standardized laboratory methods.

**Results:** Every patient presented symptoms. 69,24% (n=18) of the children were between 13-18 years of age, 15,38% (n=4) were between 6-13 years of age, 7,69% (n=2) were between 1-6 years of age, 7,69% (n=2) were between 0-12 months of age. 27% patients (n=7) had positive family history of blood coagulation disorders. In 23,08 % of analyzed cases (n=9) DVT referred to femoral vein, 17,95% (n=7) to saphenous vein, 10,26 % (n=4) to deep veins of calf and the same to basilic vein. Analysis of patients blood parameters revealed that: 50% (n=13) had increased level of D-dimers (laboratory norm  $<500 \text{ ug/l}$ ; mean value:  $1302,65 \pm 1619,05$ ), 100% had normal values of platelets (mean value:  $287,12 \times 10^3 \pm 77,81 \times 10^3$ ). All of the patients had antithrombotic treatment and in all of them the symptoms ceased.

**Conclusions:** Frequency of DVT among children is increasing. The Doppler USG remains the most available and best diagnostic method. Early recognition and start of the therapy promotes therapeutic success and relief of the symptoms.

**Keywords:** deep, vein, thrombosis, dvt.



## **PNEUMONIA OR TUBERCULOSIS? A CASE REPORT IN A TEENAGE GIRL.**

Paweł Zapolnik

**Scientific supervisor:** Beata Zapolnik, MD

Students' Scientific Association of Clinical Genetics, Department of Clinical Genetics, Medical College, University of Rzeszów, Poland

**Background:** Tuberculosis is still a common infectious disease worldwide. About 1.7 billion people are estimated to have a latent tuberculosis infection. In 2017, 6,4 million new cases of tuberculosis were reported to WHO. However, it is estimated that the actual number of new cases was 10 million, of which childhood tuberculosis involved 1 million cases. Tuberculosis caused an estimated 1,5 million deaths. The diagnosis of tuberculosis in children is difficult due to non-characteristic symptoms. The aim of the study is to present a case of tuberculosis imitating pneumonia in a 14-year-old girl.

**Case Report:** A 14-year-old girl presented to a general practitioner due to coughing and general weakness for 3 weeks. Physical examination revealed a reduction in vesicular murmur over a significant area of the right lung. The girl was directed to the children's ward of the district hospital, a chest x-ray showed extensive densities in the right lung. After 9 days of combined antibiotic therapy, the girl felt improvement, but the radiological and auscultatory changes continued to persist. The patient was transferred to a hospital with a pediatric pulmonology ward, where the antibiotic therapy was extended. Diagnostics for tuberculosis were implemented – a result of IGRA and tuberculin sensitivity test was positive, a microscopic examination of sputum revealed no mycobacteria. Despite the treatment, the progression of the changes was observed in the chest X-ray. The girl was transferred to a specialized center of lung diseases. A 4-drug treatment plan (isoniazid, rifampicin, ethambutol, pyrazinamide) was applied for 2 months and isoniazid and rifampicin were maintained for another 4 months. Mycobacterium tuberculosis complex growth was confirmed in culture. Regression of lung changes and general condition improvement was observed after the therapy.

**Conclusions:** Tuberculosis might imitate other diseases, this should be considered in the differential diagnosis of respiratory diseases in children. Symptoms of primary tuberculosis are nonspecific – cough, low-grade fever, weight loss, weakness. In the reported case, there were uncharacteristic symptoms inadequate to radiological changes. A detailed history, determining contact with tuberculosis patient, physical examination, results of IGRAs and tuberculin sensitivity test, imaging and broad-spectrum antibiotics response are essential for diagnosis.

**Keywords:** childhood tuberculosis, symptoms, diagnostics, treatment.

## **DOES PRACTICING SPORT PROFESSIONALLY ALWAYS PAY OFF?**

Agnieszka Grygiel, Katarzyna Lipińska, Paulina Oleksa, Kinga Pierzchała, Daria Żuraw, Anna Bodajko-Grochowska

**Scientific supervisor:** Dr hab. n.med. Violetta Opoka-Winiarska

Students' Society at the Department of Paediatric Pulmonology and Rheumatology, Medical University of Lublin, Poland; Department of Paediatric Pulmonology and Rheumatology, Medical University of Lublin, Poland

**Background:** It is commonly said that practicing sports is beneficial to most children of any age. Unfortunately, doing some of them e.g. boxing they are exposed to higher multiple health risks, including cardiovascular and pulmonary diseases. Through examination of case reports this paper tries to answer the question - is it always a good thing for a child to be practicing sports professionally? We analysed the history of four young athletes hospitalized in 2013-2016 in the Clinic due to exercise-induced or drug-induced pulmonary conditions.

**Case Report:** The patients were young boys at the aged fourteen to sixteen that practiced football, boxing, bodybuilding. Three of them had been healthy before, but two of them had been taking performance-enhancing drugs and one of the boys had a knee injury a few weeks before. Another teenager hasn't taken antiasthmatic drugs for 3 months. All of them presented dyspnea, chest pain and rapid fatigue, which happened just after physical activity. Physical examination showed that the boys were in quite well or in average condition (2 boys) and presented tachycardia, periodically lowered SpO<sub>2</sub>, correct or silenced vesicular murmur or obturation (1 boy). During differential diagnosis we could exclude a cardiologic problem by performing ECG and echocardiography. AngioCT revealed a thrombus in pulmonary arteries in 2 patients, chest X-ray revealed oedema in apex of left lung (1 patient) and spirometry showed an obstructive ventilatory pattern (1 boy). Despite anticoagulant treatment, two patients with pulmonary embolism showed an aggravation of symptoms of respiratory failure. The first patient also had a cerebral embolism and after a few years he died of complications. The second one underwent steroid therapy after antiphospholipid syndrome diagnosis and like the others remain in good condition; with recommendations to limit their physical activity.

**Conclusions:** Young athletes with chronic diseases or high risk groups should undergo intensive treatment and proper follow-up medical checkups, with instructions to restrain from exhaustive physical activity during exacerbation of disease. It is important to undergo regular testing and control if athletes are also using performance-enhancing drugs and after injuries.

**Keywords:** pulmonary embolism, sport - induced diseases, young athletes.

## **AN UNWANTED BABY FOUND IN A PLASTIC BAG IN A GARBAGE BIN**

Joanna Sawicka, Aneta Stabryła

**Scientific supervisor:** Antoni Pyrkosz, MD, PhD

Students' Scientific Association of Clinical Genetics, Department of Clinical Genetics, Medical College, University of Rzeszów, Poland

**Background:** The problem of young mothers abandoning their own newborn babies is still popular. Despite the existence of windows of life, where without formalities and unnecessary questions you can leave the newborn in proper care still, we hear about the incidents of brutal disposal of babies and creating very dangerous situations for them. In our work, we would like to present the story of a girl left by a mother in a trash bin wrapped in a plastic bag. The child had practically no chance of survival, and yet the will to live is stronger than the difficulties of fate.

**Case Report:** The child was born at home. The girl was found by a rescue team in a dumpster wrapped in a plastic bag and taken to the hospital. Assessed on the maturity scale for 34 weeks of pregnancy with morphological features of intrauterine hypotrophy. The newborn was in a medium-heavy state, extremely cold - body temperature 29 degrees Celsius. circulatory and respiratory stability, not requiring support, vital. From birth, she was trophic fed. In the following days there was a gradual improvement in feeding tolerance. Parenteral nutrition was used until 6 days of age. Due to the ineffective sucking reflex up to 21 days of age, gastric tube feeding was used to simultaneously stimulate the sucking reflex. On the following days sucking was normal and feeding was associated with weight gain. The child was discharged home - it was handed over to the nuns running the Orphanage, on the 46th day of life in a good condition. Among other things, a genetic consultation was commissioned - the occurrence of disorders resulting from possible hypoxia of the child.

**Conclusions:** To sum up, newborns abandoned by their mother have little chance of survival, especially when they are premature babies. The main problems in such children are hypothermia and breathing difficulties. Due to insufficient thermoregulatory mechanisms, the premature baby must be in an incubator. These children are also struggling with growth and weight deficiency, and those who survive may have neurological and developmental disorders.

**Keywords:** premature baby, abandoned, hypotrophy, hypoxia.

**LYME ARTHRITIS**

Olena Luts, Lesia Kosinska

**Scientific supervisor:** Nykytyuk Svitlana

Department of Pediatrics with Children Surgery, Ternopil National Medical University, Ukraine

**Background:** Lyme disease is a multisystem illness that is caused by spirochete *Borrelia burgdorferi*. It is transmitted via tick or insect bites. Lyme disease manifests with erythema migrans, fever, joint pain, fatigue, malaise, headache, swollen lymph nodes. Lyme arthritis is the most common manifestation of the disseminated form of Lyme disease.

**Case Report:** 12 years boy presented with complains of generalized weakness, swelling, difficulty of movement of left knee joint. History of present illness : Symptoms started on 14.03.2019 after trauma of a knee joint. He was given therapy (Unidox solutab) but symptoms persisted. Additionally, he developed swelling, pain and difficulty of movement in his hip and ankle joints. Epidemiological anamnesis: endorses tick bite in abdominal region in May, 2018. CBC: Hb 115 g/l, (RBC) 4,63, CI 0.9, WBC 12 000, bands – 4 %, segmented neutrophils – 64 %, eosinophils – 3 %, lymphocytes – 26 %, monocytes – 3 %, erythrocyte sedimentation rate 40 mm/hr (normal 2-10mm/hr). ECG: heart rate (hr) 78 per 1 min. ,Incomplete right bundle branch block. Miocardial hypoxia. Biochemical test: glucose 5.52 mmol/L, total protein 81.4 g/l, BUN 3.13 mmol/L, creatinine 43.6 mmol/L, bilirubin total 2.4 mmol/l, ? 2.68 mmol/L, N? 141.4 mmol/L, ?? 4.8 mmol/L, AST 52.5 U/L, ALT 17.0 U/L (normal < 40 U/L), amylase 77.9 U/L. Spinal fluid analysis: glucose 3.1 mmol/L, chloride 125 mmol/L, cell count 2 /1 mm<sup>3</sup>, neutrophils – 70 %, lymphocytes – 30 %. Immunological examination: anti-*Borrelia* IgM 1.79 RU/ml (pos. 1.1), IgG 7.05 RU/ml (pos 1.1). Immunoblot: antibodies IgM: Surface proteins OspC Bg (*B. garinii*) and P41, p39, OspC(*B. afzelii*), IgM were identified, antibodies IgG: VlsE(*Borrelia burgdorferi*), P41 . IgG , were detected. Rheumatic test: C-reactive protein: 40.45, Anti –streptolysin-O: 500. Rheumatoid factor – negative. Ultrasound examination of the joints: signs of bursitis and synovitis. Differential diagnosis: include juvenile idiopathic arthritis, rheumatoid arthritis. Diagnosis: Lyme borreliosis, manifestation form, disseminated stage, subacute course of moderate severity. Lyme arthritis

**Conclusions:** For differential diagnosis of Lyme arthritis, it is necessary to observe two-stage serological investigation of blood, especially use of antibody screening tests by ELISA with subsequent confirmation by the Western blot assay.

**Keywords:** Lyme arthritis, Lyme diseases, borrelia, ELISA, immunoblot.

## ANALYSIS OF CHILDREN WITH PNEUMONIA TREATMENT IN A HOSPITAL SETTING

Vaibhav Tripathi

**Scientific supervisor:** Assoc. Prof. N. Haliyash

Department of Pediatrics No.2, I. Horbachevsky Ternopil National Medical University, Ukraine

**Introduction:** Community-acquired pneumonia is a common serious infections in children, with an annual incidence of 34 to 40 cases per 1,000 children in Europe. To make a diagnose pediatricians should mainly consider the patient's history and physical examination, supplemented by judicious use of chest radiographs and laboratory tests. Streptococcus pneumoniae and viruses are the most common causes in infants, as well as in preschool-aged children. Pneumonia frequently starts as an upper respiratory tract infection. Typically symptoms include some combination of productive or dry cough, chest pain, fever, trouble breathing. Treatment is based on the likely etiology of the infectious organism and clinical status of the patient and mainly includes antibiotics, hydration, oxygen therapy and expectorants.

**Methods:** This study is retrospective descriptive analysis. We have analyzed medical cards of children which received inpatient treatment at the infection-diagnostic department of Ternopil Regional Pediatric Hospital, during 2016-2017. Patients diagnosed with acute pneumonia on the basis of approved protocols were selected for analysis. Thus the study group comprised 189 patients. Their average age was (15±1.23) months.

**Results:** Among 189 cases of pneumonia 54 (28.6%) patients have unilateral form and 132 (71.4%) – bilateral. Pneumonia was complicated with bronco-obstructive syndrome in 69 (36.5%) children. In 115 (60.85%) cases there were signs of respiratory insufficiency of I degree, in 52 (27.51%) – II degree, in 6 (3.17%) – III degree. Analyzing the data of CBC, we have noticed that leukocytosis was registered in 33 (17.46%) cases only and shift of WBC to the left was revealed in 24 (12.69%) patients. Analysis of the antibiotic prescription revealed that most of patients (148 (78.3%)) received 3rd generation cephalosporins, 36 (19.04%) were treated with protected ampicillins and 2 (1.05%) with amoxicillin. 96 (50.79%) patients were administered mucolytics, while only 5 (2.65%) received oxygen therapy.

**Conclusions:** Most of the hospitalized children were found to have mild to moderate pneumonia. In terms of blood counts, it can be concluded that most of the cases of pneumonia in studied children is initially caused by simple viral infection. 148 (78.3%) patients received 3rd generation cephalosporins, which is different from world practices.

**Keywords:** pneumonia, children, treatment.

## **THORACOSCOPIC SURGERY IN 17 YEAR OLD PATIENT WITH MEDIASTINAL GANGLIONEUROMA**

Adam Szatkowski, Dorota Małkiewicz

**Scientific supervisor:** Marek Wolski, MD

Department of Pediatric Surgery, Medical University of Warsaw, Poland

**Background:** Ganglioneuroma is a rare, benign tumor of neuroblastic origin. It arises from sympathetic ganglion cells and grows slowly, reaching an average size of 7 cm. Ganglioneuroma has a tendency to occur more frequently in females and 60% of cases involve patients below 20 years of age. Typical location of the tumor is along the sympathetic trunk, with ganglioneuromas of the mediastinum, retroperitoneum and adrenal glands being especially common. The tumor is usually asymptomatic, apart from cases when it causes local mass effect. As a benign tumor, ganglioneuroma is treated with surgical excision, and even without complete removal, the prognosis is excellent.

**Case Report:** 17 year old female was diagnosed with heart arrhythmia during a routine pediatric check-up. In the course of cardiological diagnostic process, MRI of the heart was ordered. The scan revealed a large tumor in posterior inferior mediastinum, sinistrolaterally to the vertebral column. The MRI was repeated a week later at a reference hospital. The lesion was measured to be 108 × 91 × 72 mm. Its radiological presentation aroused suspicion of ganglioneuroma, which was confirmed six days later in a histopathology test of core-needle biopsy material. The patient was qualified for surgery in two weeks. However, the surgery was cancelled due to technical issues. Ultimately, the patient was operated on two months later than initially scheduled, at a tertiary hospital. The tumor was resected thoracoscopically and removed from the body by means of an endocatch bag. A single drain was placed in an incision made previously for a trocar. The postoperative time was uneventful. Chest drain was removed on 12th day after the surgery. On 13th postoperative day the patient was discharged home.

**Conclusions:** Ganglioneuromas are unlikely to cause any symptoms in patients and can be found as incidentalomas when they are already large. In this case, despite the tumor being very large, it was feasible to remove it by means of a minimally invasive technique. It remains unclear whether the tumor exerted a mass effect on patient's heart and caused the arrhythmia.

**Keywords:** ganglioneuroma, incidentaloma, thoracoscopy, pediatric surgery.

## THE MOST COMMON COMPLICATIONS IN HOSPITALIZED CHILDREN WITH VARICELLA

Klaudia Nowicka, Martyna Szewczyk

**Scientific supervisor:** Ewa Talarek, MD, PhD

Department of Children's Infectious Diseases, Medical University of Warsaw, Poland

**Introduction:** Varicella, caused by the varicella-zoster virus (VZV), is a childhood disease affecting those younger than 20 years in 95% of cases. In immunocompetent children it is generally relatively mild and self-limiting but complications resulting in hospitalization are reported. The aim of this study was to analyze the causes of hospitalization in the course of varicella in children and to describe the most common complications.

**Methods:** An analysis was performed of the medical documentation of children hospitalized for varicella in Department of Children's Infectious Diseases, Medical University of Warsaw, from 01.01.2015 to 31.12.2017. The complications were defined according to ICD-10 and were further analyzed.

**Results:** From January 2015 to December 2017, 473 varicella associated hospitalizations were reported. There were 240 boys and 233 girls, the mean age was 3 years 10 months (range: 11 days - 17 years 11 months). 23 children were hospitalized because of their immunodeficient status and need of intravenous antiviral treatment. The remaining 450 patients were admitted because of complications and/or coincidence with other condition. Bacterial infections of the skin and soft tissue were the most frequent complications (286 cases; 60,47%), followed by respiratory tract infections (107 cases; 22,6%). The most common clinical form of bacterial skin complication was pyoderma, which occurred in 280 children. Cellulitis was diagnosed in 56 patients. Abscess formation was reported in 7 patients. The mean length of hospitalization was 5 days (range: 1-15 days). Among children with respiratory tract infection in 36 cases pneumonia was diagnosed, in 30 – URTI, in 28 – acute otitis media and in 13 - bronchitis. The mean length of hospitalization in this group of patients was 5 days (range: 1-20 days).

**Conclusions:** Bacterial skin infections are the most common complications of varicella among hospitalized paediatric patients. The clinical course may be severe and complicated resulting in prolonged hospitalization or need of surgical intervention.

**Keywords:** infectious diseases, varicella, epidemiology, complications.

## **A CASE OF RETROPHARYNGEAL TUMOR IN A CHILD**

Małgorzata Matuszek, Ewa Kopyto, Michał Kaczor, Anna Masajada, Dorota Sławińska

**Scientific supervisor:** Magdalena Maria Woźniak PhD, Assoc. Prof.

Department of Pediatric Radiology, Medical University of Lublin, Poland

**Background:** Tumors located behind the posterior pharyngeal wall are rare pathology in the pediatric population. Mostly, these are retropharyngeal abscesses resulting as a complication of upper respiratory tract infection, in children before 5 years. Due to the high tissue diversity, both benign or malignant tumors can be diagnosed. The location of these tumors and their size predisposes to the occurrence of mass effects, giving symptoms of dysphagia, shortness of breath, head bending and change of voice tone. Non-specific symptoms cause difficulties in the diagnostic process. The American College of Radiology considers ultrasonography, computed tomography (CT) with intravenous contrast media, and magnetic resonance imaging (MRI) as appropriate imaging studies for a child up to 14 years presenting a neck mass.

**Case Report:** A 34-month-old girl was admitted to the Hospital Emergency Department due to non-specific symptoms reported by her parents. The most obvious that had occurred two weeks before were walking disorders, torticollis, behavior change, and loss of appetite. X-ray examinations of the neck and head CT did not show any abnormalities. MRI with intravenous contrast media performed a pathological mass of 42 mm x 30 mm x 28 mm in the retropharyngeal space. The tumor placed from the lower part of the clivus to the base of C2 vertebra, causing significant pressure and displacement of the medulla oblongata. The patient was qualified for biopsy.

**Conclusions:** Retropharyngeal tumors are often a difficult diagnostic and therapeutic problem due to their rare occurrence and unexpected association between disease and late-onset symptoms. Imaging may help with diagnosis and with planning for invasive intervention.

**Keywords:** retropharyngeal tumor.



## ASSESSMENT OF PATIENTS' PHYSICAL ACTIVITY DURING HOSPITALIZATION IN DEPARTMENT OF PEDIATRIC ONCOLOGY AND HEMATOLOGY

Hubert Niewiński

**Scientific supervisor:** Małgorzata Sawicka-Żukowska, PhD

Department of Pediatric Oncology and Hematology, Medical University of Białystok, Poland

**Introduction:** Oncological diseases are connected with diminished physical activity in patients. Prolonged hospitalization, immobilization, disease itself, coexisting eating and metabolic disorders, depression and many others are the reasons for low activity rate in oncological patients. Consequences of low physical activity during treatment are persistent and influence the quality of life of cancer survivors.

**Methods:** We analyzed physical activity (PA) by 3-day observation of walked steps in 61 patients (49 boys) during antineoplastic treatment for leukemias and lymphomas (n=50), solid tumors (n=11). Control group was composed of 30 children (15 boys) hospitalized in the department for other reasons rather than oncological, which didn't influence physical activity. We used TANITA (Monitoring Your Health) – Model AM-120E to count steps, distance (km) and time (min) of activity. High PA was defined as more than 10000 steps a day. In every patient we analyzed body mass index (BMI, kg/m<sup>2</sup>), percent of body fat (PBF, %), fat mass (FM, kg) and skeletal muscle mass (SMM, kg).

**Results:** Children treated for neoplastic diseases demonstrate lower level of PA compared to the control group in every day of observation (p<0,05). In examined group median of number of steps was 1073 in day 1, 1160 in day 2 and 1890 in day 3. In controls – 4303, 4733, 4556 respectively. Distance in km and time of activity every day of observation was statistically higher in controls than in oncological patients (day 1: 2.29 vs 0.6 km, 31 vs 11 min; day 2: 2.88 vs 0.65 km, 33 vs 15 min; day 3: 2.77 vs 0.92 km, 32 vs 13 min; p<0.01). BMI, FM, and PBF were statistically higher in patients during antineoplastic treatment (22% vs 0%, 55% vs 27%, 68% vs 33% was above the norm; p<0.01). The difference in SMM is statistical significant, 43% in study group vs 13% in control group has SMM below the norm.

**Conclusions:** Low level of physical activity in children during antineoplastic treatment is very concerning. Interventional programs based on physical activity adjusted to the disease, treatment, and age should be introduced to pediatric oncology as a part of the therapy.

**Keywords:** physical activity, leukemia, tumor, fat mass, obesity, childhood.

## **RECURRENT PNEUMONIA – A DIAGNOSIS REQUIRING VERIFICATION: A CASE REPORT**

Agnieszka Grygiel, Faustyna Piędel, Agata Rocka, Dominika Madras, Klaudia Pagacz, Kamil Janeczek

**Scientific supervisor:** Dr n. med. Kamil Janeczek, Dr hab. n. med. Violetta Opoka-Winiarska

Student Research Group, Department of Pulmonary Diseases and Children Rheumatology, Medical University of Lublin, Poland; Department of Pulmonary Diseases and Children Rheumatology, Medical University of Lublin, Poland

**Background:** Neuroendocrine cell hyperplasia of infancy (NEHI) is a rare disease classified as an interstitial lung disease. The incidence of this disease is unknown, so far 130 cases have been described. Children with NEHI usually present in the first year of life after the newborn period with classic findings of shortness of breath, tachypnea, chest retractions, hypoxemia, and crackles on examination. Typically, the disease is fever-free and the symptoms listed above occur chronically. A high-resolution computed tomography (HRCT) of the lungs usually shows a characteristic pattern called ground-glass opacities. The primary histopathologic abnormality in NEHI is increased neuroendocrine cells, which are identified based on immunopositivity to bombesin and serotonin. The diagnosis is made by excluding other causes of the symptoms and the presence of typical findings in HRCT of the chest. A lung biopsy is not required to make the diagnosis except in children with atypical clinical or HRCT findings. The aim of this study is to present the case of an infant with NEHI, who was initially misdiagnosed with recurrent pneumonia.

**Case Report:** The 11-month-old infant was admitted to the University Children's Hospital in Lublin for the diagnosis of recurrent pneumonia. Over the past six months, the boy was diagnosed with pneumonia three times. No fever was observed. The child had a cough each time, and tachypnea and bilateral crackles were determined in the physical examination. Perinatal and family history is irrelevant. The child was vaccinated in accordance with the Polish immunization schedule. At the time of admission to the hospital, the boy was in a fairly good general condition, body temperature was normal, saturation 95%. The physical examination revealed: tachypnea, slightly prolonged exhalation, slight puffing of intercostal spaces, and crackles over the lung fields. Periodic decreases in saturation below 92% have been observed. Laboratory tests have excluded immunodeficiencies and an infectious background of the presented symptoms. HRCT revealed ground-glass opacities in the right lung. Lung ultrasound showed a bilaterally increased number of B-line artifacts. NEHI was diagnosed based on clinical symptoms (shortness of breath), physical examination (chronic tachypnea in child under 2 years old, chronic crackles, periodic hypoxemia), and additional tests (ground-glass opacities on HRCT of the chest, negative results of tests for bacterial and viral infections). Systemic glucocorticoids therapy was implemented.

**Conclusions:** NEHI is a relatively rare disorder of the lungs but it is still underdiagnosed. It should be remembered that the diagnosis of this disease can be made on the basis of medical history, physical examination and imaging, without the need for a lung biopsy.

**Keywords:** NEHI, neuroendocrine cell hyperplasia, interstitial lung disease in children, ground-glass opacification.

## **THROMBOPHILIA AS A SERIOUS PROBLEM IN PEDIATRIC POPULATION – ROLE OF AGE, SYMPTOMS AND LABORATORY TESTING IN DIAGNOSTIC PROCESS**

Dominika Tatar, Kinga Dudek, Weronika Hajzler, Tomasz Jurasz

**Scientific supervisor:** Dr n. med. Aneta Pobudejska - Pieniążek

Department of Pediatric Hematology and Oncology, Faculty of Medical Science in Zabrze, Medical University of Silesia, Poland

**Introduction:** Thrombophilia is an abnormality of blood clotting, which leads to thrombosis in blood vessels. Among children the most common cause of thrombophilia is overactivity of coagulation factor due to gene mutations of factor V Leiden, MTHFR enzyme, prothrombin and deficiency of natural anticoagulants. We decided to find correlations between age, symptoms, results of blood tests, molecular mutations among children who suffer from thrombophilia.

**Methods:** We selected group of 41 patients (18 females, age  $9 \pm 6,62$  yrs) hospitalized in Department of Pediatric Haematology and Oncology in Zabrze between 2012 and 2018, due to suspicion of thrombophilia.

**Results:** Mutation of MTHFR genes alleles were the most frequent: C677T (51,2%) and A1298C (34,2%). Thrombophilia suggesting episodes were: thrombosis of: lower limbs (24,39%), upper limbs (7,32%) and CNS (central nervous system) (9,76%). Also in our cases CNS haemorrhage (14,63%) occurred. The positive correlation was found between age and thrombosis of lower limbs ( $r = 0,42$ ,  $p < 0,05$ ) and between age and thrombosis of upper limbs ( $r = 0,33$ ,  $p < 0,05$ ). Also negative correlation was significant between age and CNS haemorrhage ( $r = -0,33$ ,  $p < 0,05$ ).

**Conclusions:** The older the child, the greater possibility of thrombophilia revealing in the form of lower or upper limb thrombosis. However, CNS haemorrhage suggests the presence of thrombophilia in younger patients. The genetic testing for thrombophilia are necessary part of a diagnosis and the blood tests are of auxiliary importance. Symptoms of thrombophilia may be non-specific and usually only serious episode of clotting disorder leads to diagnosis.

**Keywords:** thrombophilia, thrombosis, haemorrhage.

## **DIFFERENT FACES OF EBV INFECTION IN CHILDREN**

Kinga Brzuszkiewicz, Ewelina Piskorz, Klaudia Szukała, Małgorzata Drozd, Sandra Jastrzębska, Anna Bodajko-Grochowska

**Scientific supervisor:** Dr n. med. Anna Bodajko-Grochowska, Dr hab. n. med. Violetta Opoka-Winiarska  
Student Research Group, Department of Pulmonary Diseases and Children Rheumatology, Medical University of Lublin, Poland

Department of Pulmonary Diseases and Children Rheumatology, Medical University of Lublin, Poland

**Background:** The Epstein-Barr virus (EB) is one of the most common viruses in the world and causes infectious mononucleosis, which is usually asymptomatic in children and is a self-limiting disease. It can cause life-threatening complications. The aim of the study is to draw attention to the differences in the clinical course of infectious mononucleosis among young children and adolescents.

**Case Report:** Patients hospitalized in the Clinic in 2015-2019 who were diagnosed with EB virus. Of the 6 patients hospitalized : 4 boys were 2.5-6 years old, the other 2 children were 15-17 years old. Acute EBV infection in serologies was confirmed in both age groups - positive anti- EBV antibodies in IgM class, one teenager had positive latex agglutination test. At the time of admission, all small patients were in a fairly good general condition, 75% of them had symptoms (high fever and cough) from 12-28 days before hospitalization. In addition, sore throat (1 patient) and recurrent rash on limbs (1 child) were observed in this group. All of this group had previously received outpatient antibiotics. Physical examination revealed hyperemic posterior pharynx, enlarged tonsils (2 children with gray raids), enlarged submandibular and / or cervical lymph nodes, and 3 additionally hepatosplenomegaly while teenage patients presented high fever up to 40 degrees Celsius and sore throat for several days. while physical examination showed a general average or quite good condition. Described patients developed complications of mononucleosis: hematological (leukopenia-1 patient, neutropenia -3, prolonged coagulation times - 2), respiratory (pneumonia with pleural effusion - 1) and elevated liver parameters (in 5 children). 100% of patients had symptomatic treatment, initially also they had antibiotic therapy, and 2 of them also acyclovir. In older children, despite the treatment, clinical deterioration was observed.

**Conclusions:** Mononucleosis is a disease with many clinical masks and its full-blown course is often not observed in young children, however more severe course of the disease can occur in adolescents. Despite the differences in the course of EBV infection, life-threatening complications may occur in all sick children. Developing complications may disturb the typical clinical picture of infectious mononucleosis, delaying its diagnosis.

**Keywords:** Epstein-Barr virus, EBV, mononucleosis.

## **ANALYSIS OF EBV INFECTION CASES AS A REASON FOR HOSPITALIZATION IN PEDIATRIC ONCOLOGY**

Patrycja Guzy, Aleksandra Darmochwał

**Scientific supervisor:** Małgorzata Sawicka-Żukowska MD, PhD

Department of Pediatric Oncology and Hematology, Medical University of Białystok, Poland

**Introduction:** EBV is associated with a variety of diseases including infectious mononucleosis. There are some symptoms and clinical manifestation, including lymphadenopathy, fatigue, splenomegaly that can suggest leukemia or lymphoma. Abnormalities in blood morphology, especially presence of abnormal lymphocytes in blood smear, can also concern doctor, suggesting oncological disease. These are the reasons why some patients with mononucleosis, before the proper diagnosis, are sent to the oncological department. The aim of the study was to evaluate the cases of infectious mononucleosis admitted to Department of Pediatric Oncology and Hematology.

**Methods:** We have analyzed medical documentation of 22 patients (16 boys, 1-17 years, medium age 5 years and 9 months) admitted to the Department of Pediatric Oncology and Hematology, Medical University of Białystok with oncological disease suspected because of blood morphology results and clinical symptoms who were then diagnosed with infectious mononucleosis. Patients were hospitalized between 2016 and 2018. Data was obtained from electronic documentation system CliniNet. The analysis included clinical symptoms, morphology parameters, blood smear, lactate dehydrogenase activity, inflammatory parameters.

**Results:** 86% (n=19) of analyzed patients had lymphadenopathy, among them cervical lymphadenopathy was present in 17 patients. Pharyngitis was observed in 12 cases. 41 % (n=9) of patients had increased leukocytosis, 59 % (n=13) of children had leukopenia. (mean WBC 14,4 +/- 13,015  $10^9/l$ ). 41% patients has increased lactate dehydrogenase level. Only in 14% of cases inflammatory parameters including CRP were increased. Analysis of blood smear showed: 10 cases of lymphocytosis and 13 cases of neutropenia according to age norms. Positive IgM antibodies against EBV were observed in 100%.

**Conclusions:** Infectious mononucleosis can mimic leukemia or lymphoma because of very similar symptoms and abnormal morphology parameters. In diagnosis of infectious mononucleosis, presence of IgM antibodies against EBV and microscopic evaluation of blood smear can be used to distinguish mononucleosis from lymphoproliferative disease.

**Keywords:** EBV infection, mononucleosis, leukemia, pediatric oncology.

## **PULMONARY HYPOPLASIA ASSOCIATED WITH CONGENITAL DIAPHRAGMATIC HERNIA: A CASE REPORT**

Patryk Jasielski, Piotr Pokorski, Piotr Pataj, Magdalena Staniec, Kamil Janeczek

**Scientific supervisor:** Dr n. med. Kamil Janeczek, Dr hab. n. med. Violetta Opoka-Winiarska

Student Research Group, Department of Pulmonary Diseases and Children Rheumatology, Medical University of Lublin, Poland

**Background:** Congenital diaphragmatic hernia (CDH) is a condition characterized by a defect in the diaphragm leading to the dislocation of abdominal organs into the thoracic cavity affecting the normal development of the lungs. The defect may range from a small aperture in the posterior muscle rim to the complete absence of the diaphragm. The defect occurs with a frequency of 14 cases per 10,000 births and varies across the population. It can be prenatally diagnosed by ultrasound examination, fetal echocardiography, and fetal MRI. Hypoplasia of the lungs is a congenital defect, characterized by a decreased amount of pulmonary tissue, and vessels with fewer and smaller peripheral airspaces than a normally developed lung. The architecture of the lung is immature. It can be a primary disease with unknown cause or secondary cause due to space-occupying lesions in the chest (e.g. CDH), malformations of the chest wall, oligohydramnios, and neuromuscular disorders. The aim of this study is to present the case of a child with pulmonary hypoplasia associated with congenital diaphragmatic hernia.

**Case Report:** An almost 2-year-old girl with left lung hypoplasia was admitted to the clinic for a lung ultrasound check-up. During the interview, it was determined that she was born prematurely, in the 35th week of gestational age, rated 6 points on the Apgar scale, with a birth weight of 2200 grams. Left-sided diaphragmatic hernia in the 20th week of pregnancy during prenatal tests was diagnosed. Hernia in the 2nd day of her life was successfully eliminated during surgery. In the lung perfusion scintigraphy, the share of the left lung in total perfusion was only 16% and thus left lung hypoplasia was diagnosed. The child was vaccinated in accordance with the Polish immunization schedule (including pneumococcal vaccination). On admission, the child was in good condition, with normal circulatory and respiratory functions, but with weight and height deficiency. The physical examination found that the lower border of the left lung was higher compared to the right lung. Laboratory test results were normal. In the lung ultrasound, the lower border of the left lung was visualized 2 intercostal spaces higher than the lower border of the right lung. In addition, an increased number of B and Z line artefacts on the left side was found in the ultrasound.

**Conclusions:** Congenital defects, such as CDH, are conditions which require prompt diagnosis and correct treatment in order to foster the child's correct development. It underlines a pivotal role of prenatal ultrasound examination. Children with pulmonary hypoplasia require periodic examination and monitoring of their respiratory function. They should receive influenza vaccination every year, and in the case of respiratory tract infections, appropriate treatment should be promptly implemented to avoid severe disease. In connection with the above, the girl will report to the clinic for another follow-up visit in 6 months.

**Keywords:** congenital diaphragmatic hernia, pulmonary hypoplasia, ultrasonography.

## TWO CASES OF CONGENITAL SALT WASTING SYNDROME IN NEWBORNS.

Karol Mazur, Sandra Jastrzębska, Agnieszka Kwiatkowska, Izabela Oleksak, Justyna Szpyra

**Scientific supervisor:** Dr n. med. Agata Tarkowska

Student's Research Group of the Department of Neonate and Infant Pathology, Medical University of Lublin, Poland

**Background:** Disorder involving increased urinary sodium excretion and equally potassium retention is named congenital salt wasting syndrome (CSWS). Syndrome could be presented by congenital or adaptive lack of mineralocorticoid especially aldosterone. Main reason of this disorder are congenital hypertrophy of the adrenal glands. Congenital hypertrophy is known as adrenogenital syndrome. Inhibition enzymes of reaction of synthesis hormones is the essence of this mal. The case of salt loss could be induced by resistance to aldosterone by the mineralocorticoid receptors- pseudohypoaldosteronism (PHA). PHA is hereditary syndrome, it could be caused by genetic disorders with activity of receptors. The aim is to present two different clinical presentations of CSWS in newborns.

**Case Report:** Case one: A 2-week-old female infant was admitted to hospital due to prolonged jaundice, poor feeding, weight loss and plentiful regurgitations. She was born at term, birth weight 3300g. On physical examination: dehydration, malnourishment and decreased muscle tone. Biochemical investigations revealed hyperkalaemia and hyponatraemia. Based on the correct result of the level of cortisol, ACTH and 17-OH-progesterone adrenal insufficiency has been excluded. The first clue to recognized pseudohypoaldosteronism was unresponsiveness to supplementation of mineralocorticoids, next elevated plasma renin and aldosterone levels. After initiation of oral supplementation with sodium chloride, complete resolution of clinical and laboratory symptoms was achieved, which confirmed pseudohypoaldosteronism type I. Case two: A 1-week-old male infant was admitted to a hospital due to an incorrect CAH screening test's result- very high concentration of 17-OH-progesterone, incorrect steroid profile. Born at 39 weeks, birth weight 3550g. General state: cardiorespiratory fitness, apathetic state, dehydration, weight loss. Found: yellowed skin and scleras, dark nipples, discolored scrotum and penis. Laboratory tests confirmed CAH: high 17-OH-progesterone, ACTH, DHEA, testosterone, low cortisol. Substitution treatment and adding salt to meals were started. The patient showed good response to the treatment during next examinations

**Conclusions:** The symptoms of CSWS such as weight loss, difficulties in feeding, dehydration and malnutrition, accompanied by sodium-potassium disorders are usually caused by congenital adrenal hyperplasia detected in screening, which is carried out on all newborns since 2017. Although the symptoms may be caused by rarer diseases like pseudohypoaldosteronism, which should be included in differential diagnosis.

**Keywords:** newborn, hypocorticism, pseudohypoaldosteronism.

## **DIFFICULTIES IN TREATMENT OF LYMPHOID MALIGNANCIES IN CHILDREN WITH NIJMEGEN-BREAKAGE SYNDROME: REPORT OF FOUR CASES**

Aleksandra Filipiuk, Agata Kozakiewicz, Kamil Kośmider, Monika Lejman, Joanna Zawitkowska

**Scientific supervisor:** Dr n. med. Joanna Zawitkowska

Student's Research Group, Department of Paediatric Haematology, Oncology and Transplantology, Medical University of Lublin, Poland

**Background:** Nijmegen Breakage Syndrome (NBS) is a rare disease with an autosomal recessive pattern of inheritance. The gene responsible for the entity, NBS1, is located on chromosome 8q21 and encodes a protein called nibrin. The disease seems to be more prevalent among Central and Eastern European populations, with Polish patients constituting approximately half of all registered NBS patients worldwide. This syndrome is characterized by microcephaly, growth retardation, bird-like facial features, immunodeficiency and high predisposition to malignancy, especially mature diffuse large B-cell lymphomas and Burkitt lymphoma or T-cell lymphoblastic lymphoma/acute leukaemias.

**Case Report:** We reported four patients with NBS and haematopoietic or lymphoid malignancies treated at Department of Paediatric Haematology, Oncology and Transplantology in years 2007-2019. In these patients the DNA instability syndrome was genetically confirmed only during the diagnosis of malignancy. Two children were 13 years old and presented with cervical and mediastinal lymphadenopathy. The histological evaluation of the supraclavicular lymph node revealed T-cell non Hodgkin lymphoma (T-NHL). The patients were treated with EURO-LB 02 protocol without the drug reduction. Both children achieved a complete remission. They are alive and well. The third patient with T-NHL is during the therapy according to EURO-LB 02. The child tolerates chemotherapy well and shows an excellent response. In the fourth case T-cell acute lymphoblastic leukemia (T-ALL) was diagnosed. On admission to our department, the patient's condition was very severe with respiratory insufficiency, pulmonary oedema and effusion because of large mediastinal mass. The therapy according to ALLIC 2009 trial was started. However, this child died after 15 days due to progression of the disease.

**Conclusions:** Increased oncological alertness should be displayed in patients with genetic disorders. The treatment of lymphoproliferative malignancies in NBS children is hampered by therapy-associated toxicity and infectious complications. On the other hand, dosage-reduction is not recommended unless clear indications appear. The main reason of poor outcome comparing to patients without DNA repair defects is progressive disease, relapse and second malignancy.

**Keywords:** Nijmegen-breakage syndrome, haematopoietic and lymphoid malignancies, EURO- LB 02 trial.



## **IMPLEMENTATION OF VACCINATIONS RECOMMENDED FOR CHILDREN WITH JUNIOR IDIOPATHIC ARTHRITIS**

Magdalena Dębińska , Paulina Bieńkowska, Weronika Borkowska, Natalia Ozóg

**Scientific supervisor:** Anna Bednarek, PhD

Students' Scientific Association of Chair and Department of Peadiatric Nursing, Medical University of Lublin, Poland

**Introduction:** Juvenile idiopathic arthritis (JIA) is the most common autoimmune arthropathy in childhood. The disease is chronic. The cause of the disease is unknown. The incidence rate in Poland is 1: 1000. JIA in the first period of development is difficult to diagnose. Children with rheumatic diseases can be vaccinated with live vaccines, according to the vaccination schedule, even if they use anti-rheumatic therapy. According to EULAR, caution should be exercised when using live vaccines. However, they are not strictly contraindicated. Each patient implementing the vaccination program should be approached individually and the pros and cons of taking specific vaccines should be considered. Aim of the study: To evaluate the implementation of vaccinations recommended in children with juvenile idiopathic arthritis.

**Methods:** The method of work was a diagnostic survey, and the research tool was the author's questionnaire. The group of respondents was 31 children with JIA from 11 to 19 years old, including 61% of girls and 39% of boys. The study was conducted at the University Children's Hospital in Lublin in 2019.

**Results:** Most of the respondents (48%) were children who had JIA for 1-3 years, 32% of children had a disease for 4 to 6 years, while the least respondents (7%) had JIA for about a year. Recommended vaccinations were received by 77% of the examined children, while 23% of patients did not receive any additional vaccinations outside the mandatory immunization program. Most of the respondents (33%) were vaccinated against influenza, 25% of patients received vaccinations against chickenpox, slightly less adolescents (13%) received vaccination against HPV and meningococci. The least studied children (7%) were vaccinated against pneumococci and rotavirus. No child in the study group was vaccinated for tick-borne encephalitis.

**Conclusions:** The vast majority of teenagers with chronic JIA disease have vaccinations recommended if there are no contraindications.

**Keywords:** recommended vaccinations, juvenile idiopathic arthritis, children.

## HOW ECMO CAN SAVE A LIFE – BASED ON A 4,5-YEAR-OLD PATIENT'S CASE

Karolina Mikołaj, Julia Gieldon

**Scientific supervisor:** Dr n.med. Piotr Sawicki

Department of Anesthesiology, Intensive Care and Postoperative Care, Medical University of Warsaw, Poland

**Background:** An inflammatory heart disease, also known as myocarditis, can be caused by many factors, some of them being viral. Amongst viruses most commonly causing myocarditis in children is Human herpesvirus 6 (HHV-6). Patients may experience fatigue, irregular heartbeat, chest pain or symptoms similar to flu. Several complications may occur, including heart failure, cardiomyopathy or cardiac arrest. Decreased contractility may lead to cardiogenic shock, which may be challenging to treat in pediatric patients.

**Case Report:** A 4,5-year-old female patient was admitted to the Pediatric Intensive Care Unit (PICU) with an acute heart failure. Besides present obesity, the girl had no past medical history. On admission she presented symptoms of circulatory shock and hypovolemia. Electrocardiogram showed third-degree atrioventricular block with wide QRS complex. Severely impaired contraction and asynchrony were discovered using echocardiography. Blood tests revealed extremely elevated troponin, creatinine kinase and NT-proBNP. The patient was put on artificial ventilation with several inotropic medications and analgosedated. After the symptoms of cardiogenic shock aggravated, it was decided to support the patient with extracorporeal membrane oxygenation (ECMO). Ten days later the patient's state improved, and sedation was withdrawn. On the seventeenth day of hospitalization a severe aggravation of both ventricles' function was discovered and the child was sedated again. Few days later patient's state stabilized, the child could breathe on its own through an endotracheal tube with assist control. Blood results improved and extubation was performed. The patient was treated with angiotensin convertase inhibitors, diuretics and several medications with positive inotropic effect. Although right atrium and ventricle were hypertrophic and ejection fraction remained low; the child was conscious, calm, respiratorily stable. Consequently, the patient was discharged from the PICU and transferred to the Cardiology Department in a good overall state.

**Conclusions:** Some viral infections in children may lead to major complications, including heart failure. Early diagnosis and treatment are required. ECMO can be successful in treating severe cardiac failure in pediatric patients. This patient's case shows that even the most serious states can stabilize, which may give hope to the therapeutic team and pediatric patients' families.

**Keywords:** cardiomyopathy, viral myocarditis, pediatric intensive care, ECMO, cardiogenic shock.

# **Patomorphology and Forensic Medicine**

## **THE OVERVIEW ON THE APPLICATION OF POST-MORTEM RADIOLOGICAL EXAMINATIONS IN FETUSES AND CHILDREN**

Cezary Sienko, Alicja Forma, Mikołaj Margas, Marcin Czezelewski, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Students Research Group at Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** A vast number of radiological examinations including magnetic resonance imaging (MRI), computed tomography (CT), micro-computed tomography (micro-CT) and ultrasound (USG) are gradually introduced as the potential way of post-mortem (PM) examination of fetuses and children. Due to the minimal invasive properties, relatively short time of a study as well as high accuracy and precision, these techniques are considered to improve the overview on the findings of autopsy. The aim of this work was to review and evaluate all of the possible radiological examinations currently used during autopsies of fetuses and children.

**Methods:** Authors did a research on PubMed platform with the following key words combinations: ((fetus) AND post mortem) AND (MRI); ((fetus) AND post mortem) AND (ultrasound); ((fetus) AND post mortem) AND (CT). The most appropriate articles regarding the topic of this work have been chosen. The overall number of reviewed articles was 38 published in the range of 2010-2019 year.

**Results:** Application of radiological examinations including MRI, CT, micro-CT and USG is continually introduced to the field of forensic medicine as a potential tool which could improve autopsy findings. MRI constitutes a promising method of investigation of fetal brain neuropathologies. It is also applicable for search of abdominal as well as spine and spinal cord pathologies along with accurate assessment of optic nerve abnormalities in fetuses and children. Even though, MRI is not recommended for diagnosis of thoracic pathologies due to its poor diagnostic detection regarding this area. USG enables detection of congenital structural abnormalities with high accuracy. The results showed that the only exception was diagnosis of congenital cardiac diseases. Moreover, CT and micro-CT enable quick and highly accurate examination of fetuses and children.

**Conclusions:** Radiological examinations constitute useful methods during autopsies of fetuses and children providing more accurate autopsy findings. They provide additional information which could be omitted during classical autopsy. Besides, radiological studies may also present abnormalities which are simple not visible during conventional autopsy. Therefore, PM radiological examinations and related histological findings could potentially minimize the number of inaccuracies and cases of unexplained death of fetuses and children. Despite such promising results, there are still some pathologies which cannot be diagnosed by the application of radiological studies alone and must be supported by classical autopsy.

**Keywords:** post-mortem examination, radiological examination, examination of fetuses and children.

## **INVESTIGATING CAUSES OF DEATH ON THE BASIS OF THE EXHUMED REMAINS OF THE CURSED SOLDIERS**

Wojciech Koziółek, Gabriela Szypuła, Gabriela Kanclerz, Patrycja Szczepaniak, Szymon Strączek

**Scientific supervisor:** Dr hab. Tomasz Konopka

Department of Forensic Medicine, Jagiellonian University Medical College in Cracow, Poland

**Introduction:** The research we present concerns of a series of cases of Polish soldiers today known as „the Cursed Soldiers”. They were condemned to death by the communist government of Poland in 1947-1949 as a result of membership in anti-communist Polish resistance movement. Over 65 years later The Institute of National Remembrance exhumed their skeletons and requested The Institute of Forensic Medicine of Jagiellonian University to identify soldiers, examine the injuries and evaluate the circumstances of their execution.

**Methods:** This study is focused on the examination of twelve cases, exhumed in October 2018. Complete reconstruction of the skulls was followed by the analysis of trajectory of gunshots. The dry bone study revealed multiple gunshot marks in the skulls and many other bones. All of the skulls were additionally inspected to determine the entrance and exit holes and the computed tomography reconstructions were performed.

**Results:** Post-mortem reconstruction allowed to confirm the characteristics of firearms injuries, which included the approximate number of projectiles and their trajectory. The study revealed that in the majority of the cases execution by gunshot to occipital or temporal bone had been performed. Although there were a few exceptions such as frontal or multiple headshots. Shooting distance and the weapon’s characteristics were unable to determine.

**Conclusions:** Our results verify that in the described cases, soldiers were executed by gunshot to occipital or temporal bone.

**Keywords:** Polish soldiers, Cursed Soldiers, skulls, gunshot, headshot, trajectory, communism, execution.

## **'WHAT DOES THE FUCHS SAY?' CLINICOPATHOLOGICAL INVESTIGATION OF EXTRACELLULAR MATRIX PROTEINS IN BULLOUS KERATOPATHY, FUCHS' ENDOTHELIAL CORNEAL DYSTROPHY AND INFECTIOUS KERATITIS**

László Módis, Gréta Varkoly, László Módis Senior, Tibor Hortobágyi

**Scientific supervisor:** Tibor Hortobágyi MD

Department of Neurology, Faculty of Medicine, University of Debrecen, Hungary

**Introduction:** Transparency is a unique characteristic feature of the cornea, which is crucial in human vision ability. However, corneal opacity emerging via different procedures, including neovascularisation, scar tissue formation, excessive expression of adhesion molecules or extracellular matrix (ECM) proteins may destruct the clarity of the outermost layer of the eye. Our investigation focused on two ECM components, the tenascin-C and the matrilin-2. Their role has already been studied in several corneal disorders.

**Methods:** We selected three pathological conditions, the bullous keratopathy (n=20), the Fuchs' endothelial corneal dystrophy (n=9) and the infectious keratitis (n=12). Our histological sections were made of corneas removed during keratoplasty through light microscopy treated with immunohistochemical staining. A control group with intact corneas (n=11) was also launched. The evaluation of the specimens happened applying semi quantitative scores on a scale ranged from 0 to 3+ (0: negative, 0,5+: minimal-, 1+: mild-, 2+: moderate-, 3+: high positivity). The analysis of the received data happened through Student T-test.

**Results:** Besides the basic positivity which was present in all layers of the cornea in the cases of tenascin-C and appeared in the epithelium and the endothelium concerning matrilin-2, we detected significant changes in both series of experiments. Excessive expression of tenascin-C was proven in the epithelium and the stroma in all the investigated conditions, which was the most pronounced in the pre-Descemet layer. In the matrilin-2 stained sections the most significant change was the sign intensity of the epithelium and the endothelium in bullous keratopathy ( $p < 0.001$ ). In the case of the endothelium this change was a decrease. Moreover, the stromal layers also showed positivity at a lower level of significance ( $p < 0.05$ ).

**Conclusions:** Based on this overview of our results it can be exclaimed that both matrilin-2 and tenascin-C ECM proteins' expression is varied in all three of the investigated conditions. Their role in the pathogenesis in the loss of corneal transparency and the detailed mechanism of their expression needs further investigation. If these features once become revealed, that may pave the way for new conservative treatments of corneal opacity, offering alternatives besides the surgical treatment, the keratoplasty.

**Keywords:** cornea, extracellular matrix, tenascin-C, matrilin-2, bullous keratopathy, Fuchs' endothelial corneal dystrophy, infectious keratitis.

## **DETERMINATION OF CATHINONE DERIVATIVES IN WASTEWATER FROM LUBLIN BY HPLC TRIPLE QUADRUPOLE MASS SPECTROMETRY (LC-MS/MS) AND HPLC LINEAR ION TRAP (LC-MS)**

Izabela Targosińska, Łucja Justyna Walczak, Kamila Komajda, Dominika Przygodzka

**Scientific supervisor:** Grzegorz Buszewicz

1 Students Research Group of Forensic Toxicology Laboratory at the Chair and Department of Forensic Medicine, Medical University of Lublin, Poland;

2 Forensic Toxicology Laboratory at the Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** Based on the European Drug Report created by EMCDDA from 2019r. we can see that in recent years, starting from 2016r, the diversity of psychoactive substances has been increasing. In Europe, synthetic cannabinoids and cathinones generally dominate among seized substances. The second of them are chemically related to an alkaloid produced by the *Catha edulis*. They have similar effects to amphetamines or cocaine. For example, cathinones include mephedrone, kiefedron or hexedron

**Methods:** Sewage samples collected from the city of Lublin and sewage wells Medical University dorms were analyzed. The samples were subjected to liquid-liquid extraction in an alkaline medium using ethyl acetate. A two-stage analysis was carried out using liquid chromatography using two types of detectors. The first analysis aimed at examining samples for the most common cathinones on the Polish market was performed using a triple quadrupole mass spectrometer. A linear ion trap type mass spectrometer was also used to research for less popular compounds. The advantage of this type of detector is high sensitivity in full scan mode, thanks to which the analysis covered a very wide spectrum of compounds. The method used allowed for obtaining a low limit of quantification of the tested cathinones at the level of 0.1 ng / ml.

**Results:** Samples taken from the average daily collection as well as those taken from sewage wells from Medical University dorms in Lublin were analyzed for cathinone derivatives, however they didn't show the presence of these compounds.

**Conclusions:** Based on the results obtained, it cannot be clearly stated whether synthetic cathinones are used in Lublin. Available literature shows that wastewater testing for psychoactive substances should have a lower limit of quantification at 1 ng / L. The technique used in the experiment requires the use of a larger amount of sample and additional purification. There are also many factors that could affect the final result, such as instability of the substances to be tested, as well as widespread use of detergents. Samples taken from the average daily collection were also pre-cleaned by MPWiK which could also have contributed to the negative result.

**Keywords:** cathinone, psychoactive substance, waste water, cathinone derivatives.

## **TOXICOLOGICAL PROBLEMS AND TRAPS OF HAIR ANALYSIS**

Kamila Komajda, Łucja Justyna Walczak, Izabela Targosińska, Grzegorz Buszewicz, Dominika Przygodzka

**Scientific supervisor:** Grzegorz Buszewicz

Students Research Group of Forensic Toxicology Laboratory at the Chair and Department of Forensic Medicine, Medical University of Lublin, Poland;

Forensic Toxicological Laboratory at the Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** Hair analysis is currently playing an increasingly important role in toxicological research. The long presence of the substance in the hair allows its determination after a few months after exposure to a factor. It is assumed that the hair grows  $1\text{cm} \pm 0.2\text{cm}$  per month. By analyzing the 1 cm long hair segments in the following months from the time of exposure, the presence of the substance can be detected, despite the fact that the patient no longer took it. It's suspected that the incorporation of xenobiotic occurs due to van der Waals interactions between the melanin ring and the compound being incorporated. The aim of the work is to present current knowledge about toxicological problems and traps during hair analysis on examples of GHB sexual offenses, alcohol consumption and cosmetic hair treatments.

**Methods:** Review of literature and published scientific articles from PubMed and the US National Library of Medicine National Institutes of Health.

**Results:** The complexity of interpretation of the results makes it difficult to disseminate the use of these tests for judicial purposes. Hair is a special matrix because there is no active metabolism or excretion of the deposited xenobiotics in their structure. Problems in the analysis of hair have various causes that have been considered in the context of sexual offenses, alcohol consumption and the impact of the results of cosmetic procedures carried out on hair. The causes include the endogenous presence of the test substance in the material as well as passive exposure and external pollution. During the toxicological analysis of the hair, all factors that could affect the test result should always be taken into account. For the above-mentioned reasons, the interpretation of the result is quite difficult and there is little awareness about them. The research conducted so far draws attention to the lack of effective methods to prevent these interference and the need to create a certain automated database on the subject of hair analysis.

**Conclusions:** Research carried out so far show that the mere presence of the substance in the hair is insufficient to confirm its consumption

**Keywords:** hair analysis, gamma-hydroxybutyrate (GHB), ethyl glucuronide.



## **IMMUNOHISTOCHEMICAL STUDY OF CYTOTROPHOBLAST INVASION IN THE STRUCTURE OF THE UTERO-PLACENTAL AREA**

Vialantta Tiulienieva, Hennadii Petrochenkov, Olena Tiulienieva

**Scientific supervisor:** Olena Tiulienieva, PhD

Department of Pathological Anatomy, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Ukraine

**Introduction:** During pregnancy the utero-placental area (UPA), is forming because of attachment of the fetal egg to the uterus. The base of the mechanism in the morphogenesis of the UPA is cytotrophoblastic invasion (CTI) - the process of migration of cytotrophoblast (CT) cells from the placenta to the endometrium and myometrium, they selectively penetrate the uterine arteries and modify them into the expanded vascular channels, which ensure the establishment of the uteroplacental blood circulation. Invasive CT are divided into interstitial (IC), multinuclear giant cells (MGC), and endothelium replacement cytotrophoblast (EC).

**Methods:** We studied 64 biopsy samples of UPA and myometrium obtained during cesarean section surgery. The term of delivery was 37-40 weeks. Immunohistochemical methods were performed on histological sections with primary antibodies against placental lactogen, protein bcl-2 with visualization using a peroxidase tag and diaminobenzidine.

**Results:** All invasive CT which were found are difficult to identify, especially EC. EC cells are sinked and distinguished it from the endothelium and without using special methods is almost impossible. Since trophoblast produces specific pregnancy proteins, methods for determining these proteins have also been tested. The best results were obtained for placental lactogen (IC -  $0.314 \pm 0.0022$ , EC -  $0.109 \pm 0.0022$ ). ICT for placental lactogen was verified in both cubic and flat forms. In our opinion placental lactogen can be recommended as "gold standard" for the identification of endothelium replacement CT. We obtained reliable results and when we used the method, we did not plan to verify the endothelium replacement CT. Also it was noted that the protein bcl-2 reliably marked endothelium replacement CT as well as placental lactogen. At the same time ICT, which did not reach the endothelium of the blood vessels of the UPA, was either negative for bcl-2 or weakly positive (IC -  $0.107 \pm 0.0011$ , EC -  $0.196 \pm 0.0014$ ).

**Conclusions:** In our opinion, the most reliable and specific methods to identify an EC in the UPA is the immunohistochemical determination of placental lactogen and protein bcl-2. These methods can be useful for studying utero-placental insufficiency, which morphogenesis basis on the violation of gestational rearrangements of the spiral uterine arteries.

**Keywords:** uterine-placental area, cytotrophoblastic invasion, placental lactogen.

## **EVALUATION OF CEREBROSPINAL FLUID IN THE POST-MORTEM DIAGNOSIS OF DROWNING**

Zuzanna Chilimoniuk, Maciej Dobosz, Alicja Forma, Piotr Wójcik, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Students Research Group at Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** Determining the cause of death because of drowning can be difficult due to the slight discrepancy of the postmortem vitreous biochemical test. Changes within cerebrospinal fluid (CSF) are considered to be a potential alternative of biochemical analyzes used for stating the cause of death. Resistance to the effect of electrolyte diffusion and water osmosis during immersion, as well as the protective anatomical location of the cerebrospinal fluid support the use of this method in the post mortem diagnosis of drownings.

**Methods:** The aim of the study is to present the current state of knowledge on the assessment of cerebrospinal fluid as a new method used in diagnosing the cause of drownings. The analyzed data is based on a literature review from 2011-2019 on PubMed and Google Scholar platforms.

**Results:** A retrospective study conducted by J. Garland's team from February 1, 2018 to January 31, 2019 confirmed the thesis that post-mortem sodium and chloride levels in cerebrospinal fluid were higher in drowning in saltwater compared to the control sample. The CSF was obtained either from the brain ventricles or from the spinal subarachnoid space. In addition, the cause of the sudden increase in sodium and chloride was mainly because of the active inhalation of salt water, not just the effects of immersion. Similar changes were demonstrated in the death of a 54-year-old man whose body was found immersed in salt water. Increased levels of sodium and chloride were found in the CSF. Moreover, studies on an animal model have shown that this method can be used to differentiate drowning in salt and fresh water. In the case of drowning in fresh water, a decrease in the concentration of electrolytes levels in samples of post mortem CSF was noted, comparing to drowning in salt water, where an increase in the concentration of all compared electrolytes was noted except for potassium and an increase in glucose.

**Conclusions:** CSF examination gives promising results to improve the methods of drowning diagnosis, especially in salt water. Furthermore, the properties of this assessment are particularly valuable for situations when the vitreous humor cannot be analyzed. Additionally, this analysis may assist in the differentiation between freshwater and saltwater drowning. However, further analysis would allow to clarify its use as an alternative in the diagnosis of drowning.

**Keywords:** cerebrospinal fluid, drowning, electrolytes, freshwater.

## **POSTMORTEM IDENTIFICATION OF WATER CONTENT IN ORGANS ACCORDING TO THE CAUSE OF DEATH**

Piotr Wójcik, Alicja Forma, Maciej Dobosz, Zuzanna Chilimoniuk, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Students Research Group at Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** The water content of human organs should always be within a narrow range to maintain homeostasis in the body. Post mortem examination of the content of individual's organs even up to five days from death may constitute an additional examination, enabling a more accurate assessment of the cause of death, as the water content does not change significantly as a result of decomposition. The purpose of the work is to present the results and potential diagnostic possibilities of using this method during autopsy.

**Methods:** An analysis of studies obtained from the PubMed database was made, which most accurately described the issue of postmortem water identification in individual organs in the body. The search involved particular keywords: 'pathophysiology', 'postmortem', 'water content' 'forensic science'. Four articles from 2017-2019 were selected for the review and analysis.

**Results:** As a result of the tests, a significantly increased water content in the lungs was observed in the case of drowning, especially in salt water, as well as in the case of death due to suffocation. The amount of water in the lungs when drowning in salt water is similar to cases of hypoxia. In addition, the water content in the lungs was higher in cases of drowning in salt water than in fresh water. Increased water content was observed in the brain tissue after death due to hypothermia and heat stroke. There were no significant changes in the amount of water in and without swollen brains. In the kidneys, the water content was greater for drowning and death caused by acute circulatory failure, than for poisoning or death in a fire. The results of the computed tomography of the atria showed a greater thinning of the blood in the left atrium in the case of drowning in fresh water. Examination of the ion content showed that people who drowned in salt water showed higher concentrations of sodium and chlorine ions in the sinus fluid. In pleural fluid, the results of the concentrations of the studied ions coincided significantly with the results of the concentrations of the ions from the sinus fluid. In a few cases, however, there was a clear lack of ionic concentration disorders in the pleural fluid, which was present in the sinus fluid.

**Conclusions:** Analysis of the results shows that water content plays an important role in identifying the cause of death. It makes it easier to distinguish drowning circumstances, and by examining the characteristic composition of the organs, more accurate cause of death can be provided.

**Keywords:** autopsy, Water content, drowning, ions, computed tomography, diagnostics.

## ADVANCEMENTS IN THE POST-MORTEM INTERVAL ESTIMATION

Małgorzata Pasztelan, Klaudyna Gietka, Jarosław Pulikowski, Iga Dudek, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Students Research Group at Chair and Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** Estimating the postmortem interval (PMI) is a significant challenge in both forensic medicine and criminalistics. Even though, there are already some forensic tools and techniques to evaluate PMI, new methods - simpler or more precise - are still being sought.

**Methods:** PubMed database from years 2015-2019 was analyzed and articles which best applied for the research problem were reviewed. The first study found, was aimed at finding correlation between concentration of RAGE protein (Receptors for Advanced Glycation End Products) and PMI. Lung tissue of drowned rats were analyzed in order to evaluate the RAGE concentration. The second study concerned dependency of oral microbiota abundance of PMI. Samples from oral cavity of dead mice were taken and analyzed in terms of ten most abundant species at 0, 24, 144 and 240 hours after death. The third study concerned postmortem changes in eye lens. Lenses of dead rabbits were collected in 24, 48, 72 and 96 hours after death and then examined in terms of their sphericity and absorbance as well as any morphological changes. The fourth study focused on postmortem changes in amount of collagen in gingival tissue in the first nine days after death.

**Results:** The study showed a gradual decrease of RAGE protein in lung tissue over time. The most significant difference occurred between day 1 and 2. Postmortem increase of oral microbiota was also found, especially among Proteobacteria, Gamma-proteobacteria or Proteus. The increase was linear between Days 1 and 10. The study of eye lenses showed postmortem decrease in their sphericity and absorbance, as well as gradual loss of their histological structure. These changes were most apparent between 24 and 96 hours after death. The morphological changes in gingival tissue also proved to be linked to PMI. Collagen fibers' degradation was utmost in samples taken after 7-9 days after death.

**Conclusions:** The research results suggest possible correlation between the examined factors and PMI. These factors include: oral microbiota, morphology and absorbance of eye lens and gingiva and concentration of RAGE protein. The findings may prove useful in PMI estimation.

**Keywords:** postmortem interval, receptor for advanced glycation end products (RAGE), oral microbiota, eye lens, forensic medicine.

## **MESENCHYMAL TUMOURS OF THE KIDNEY – SHORT REVIEW AND CASE REPORT**

Piotr Jarosz, Patryk Jasielski, Aleksandra Filipiuk, Justyna Korolczuk

**Scientific supervisor:** Dr. hab. n. med. Agnieszka Korolczuk

Student's Association, Department of Clinical Pathomorphology, Medical University of Lublin, Poland

**Background:** According to WHO classification mesenchymal tumours of the kidney are divided into mesenchymal tumours occurring mainly in adults and in children. Accumulating evidence suggests that renal mesenchymal tumours represent a group of histologically heterogeneous diseases. Mesenchymal neoplasms of the kidney in adults cover a wide spectrum with characteristic histologic and variable biologic findings. The most common benign tumour is angiomyolipoma, it accounts for approximately 1% of all surgically removed renal tumours. The most common malignant tumour is leiomyosarcoma and constitutes approximately 1% of all renal malignant lesions. Predisposing factors include: particular age (depends on the kind of tumour), gender, tuberous sclerosis (angiomyolipoma) and certain genetic mutations.

**Case Report:** We report the case of fifty-eight years old man with the history of nephron - sparing surgery due to renal cell carcinoma in 2014 in his left kidney. He presented to hospital in August 2019 with tumor mass within the same kidney. He underwent left sided nephrectomy. Histopathology revealed the presence of well – differentiated sarcoma. Immunohistochemical profile indicated possible leiomyosarcoma.

**Conclusions:** Mesenchymal malignant tumours of the kidney are rare and usually occur as primary entity. The reported case presents a very rare existence of two malignancies within the same kidney: epithelial (renal cell carcinoma) and mesenchymal (sarcoma). This indicates the necessity of the constant follow – up in patients that underwent nephron – sparing surgery.

**Keywords:** kidney, mesenchymal tumours, sarcoma.

## **ADRENAL TUMORS – SHORT REVIEW AND CASE REPORT.**

Justyna Korolczuk, Piotr Jarosz, Patryk Jasielski, Aleksandra Filipiuk

**Scientific supervisor:** Dr. hab. n. med. Agnieszka Korolczuk

Student's Association, Department of Clinical Pathomorphology, Medical University of Lublin, Poland

**Background:** Adrenal tumors are not common clinical conditions and generally are divided into neoplastic and nonneoplastic conditions. Neoplastic tumors of adrenal glands are benign or malignant. They can arise within the adrenal cortex or within the medulla. In addition of classifying them as malignant and benign they are also categorized as functioning, that secrete hormones, and nonfunctioning. Nonneoplastic tumors category can be divided into subtypes of endothelial and epithelial cysts, pseudocysts and parasitic conditions. Nowadays incidental findings of these tumors are more common with popularization of imagining studies and as a result they are named adrenal incidentalomas. The wide variety of adrenal tumors and their rare occurrence proves to render definitive diagnosis and further management difficult.

**Case Report:** We present a case of young female aged 26 with incidentally discovered tumor in her left adrenal gland. Scheduled abdominal ultrasound revealed a 4,5x4,5 cm mass in left adrenal gland, clinically diagnosed as incidentaloma. Laparoscopic resection of the adrenal mass was performed without complications. The pathology report identified a nonneoplastic growth – a hemorrhagic pseudocyst.

**Conclusions:** Although the adrenal tumors remain very rare, the detection of incidentalomas has risen with widespread use of diagnostic imagining. Still the differentiation, especially in young patients remains difficult due to broad variety of nonneoplastic and neoplastic conditions. Correct and swift diagnosis is important as most conditions can be successfully treated surgically.

**Keywords:** adrenal gland, pseudocyst, incidentaloma, tumor.

# Poster Session

## **VIRTUAL COLONOSCOPY CT AS A NEW METHOD OF ASSESSING COLORECTAL CANCER**

Anna Wójcik, Joanna Kurzepa

**Scientific supervisor:** Prof. Elżbieta Czekajska-Chehab

1 Students Scientific Association at the 1st Department of Medical Radiology, Medical University of Lublin, Poland  
2 1st Department of Medical Radiology, Medical University of Lublin, Poland

**Introduction:** Virtual colonoscopy CT (CTC) is a modern, non-invasive method used in screening for colorectal cancer (CRC). CRC is the third most common cancer in men and women. In the last 10 years the mortality rate CRC has decreased by more than 20% due to the rising developments in diagnostic techniques and optimization of surgical, neoadjuvant and palliative therapies.

**Methods:** The literature on the use of CTC in the diagnosis of colorectal cancer was analyzed. A review of the scientific literature indexed in the PUBMED database from the last 10 years was carried out. The work was illustrated by CTC examinations from the 1st Department of Medical Radiology, Medical University of Lublin and from scientific publications.

**Results:** The basic protocol used in screening CTC is native examination (without intravenous contrast agents). In the case of diagnostic CTC, the examination is extended by further series of contrast-scanning phases ( typical arterial, portal-venous or intestine phases). Gas (carbon dioxide or air) is the primary negative contrast agent used in CTC to dilate intestinal loops. The water insufflation method allows to assess local tumor stage (T-mark in TNM classification) in case of diagnostic CTC. Multiplanar reformation (MPR), virtual colonoscopy (VC), shaded surface display (SSD) and Raysum images obtained by postprocessing allow visualization of colorectal pathology in various ways with different clinical values. The use of the Computer Aided Diagnosis (CAD) algorithm in high energy tomography helps in the diagnosis and detection of intestinal tumors (especially small-sized polyps).

**Conclusions:** CTC is a good non-invasive method that allows early detection of lesions in the large intestine with specificity and sensitivity similar to classic colonoscopy in screening patients with suspected colorectal cancer. Comparatively with endoscopic examination CTC does not require sedation, is more accepted by patients ( painless, less discomfort ), has shorter duration of examination and lower risk of bowel perforation. The main disadvantages of this method are no possibility for biopsy or polyp excision and radiation exposure. In both methods, CTC and colonoscopy, good preparation of the patient for examination is very important for proper diagnosis and interpretation of this imaging procedure.

**Keywords:** virtual colonoscopy CT, CT colonography, colorectal cancer, CAD.



## **ASSOCIATION OF EXERCISE WITH HAND GRIP STRENGTH AND STRESS AMONGST MEDICAL STUDENTS**

Juliana Orrego Castellanos, Agastya Patel, Laura Makena, Samira Barre

**Scientific supervisor:** Prof. Ewa Bryl, MD, PhD

Department of Pathophysiology and Experimental Rheumatology, Medical University of Gdańsk, Poland

**Introduction:** Exercise has a positive impact on both, physical and mental health. High stress levels have been associated with increased risk of cognitive dysfunction, depression, heart disease among others. Performing any kind of physical activity releases endorphins which in turn helps reduce stress levels. Furthermore, conducting physical activities improves muscle activity and overall well-being.

**Methods:** The objective of this study was to correlate hand-grip strength (HGS) and level of stress among medical students, comparing them with the amount and type of exercise performed as well as differences between genders. Participants were asked to rate their current level of stress on a scale from 1-10, and a dynamometer was used to measure HGS. Additionally, students were asked if they participated in any physical activity, the number of days they exercised in a week and choose the type of exercise they performed.

**Results:** Sixty-six percent of males stated they exercise. These achieved higher HGS measurements than those who did not exercise. 57% of females performed some kind of exercise, and their results were similar to the males. Increase in HGS was seen among both, males and females, who exercised between 4-7 days compared to those who only exercised 1-3 days. The self-rated stress (SRS) among the students who perform any type of exercise was lower compared to those who did not exercise at all. Levels of SRS among males who performed aerobic exercise were lower than those who performed both aerobic and strength training, and even lower compared to those who performed strength training alone. In females, those who performed both types of exercise rated their stress lower compared to aerobic or strength training alone.

**Conclusions:** In conclusion, our data demonstrates a parallel between students who exercise with higher HGS and lower SRS. Mixed type of exercise appears to be more beneficial for females with respect to both, HGS and SRS, while in males, strength training increases HGS and aerobic lowers SRS. Differences between the sexes and their results could serve as a guideline to what type of exercise is more beneficial to their health.

**Keywords:** exercise, handgrip strength, stress.

## ANTI-INFLAMMATORY ACTIVITY OF BIOMASS EXTRACTS FROM NASTURTIUM OFFICINALE BIOREACTOR'S CULTURES AND HERB EXTRACTS

Marta Klimek-Szczykutowicz, Agnieszka Szopa, Michał Dziurka, Halina Ekiert

**Scientific supervisor:** Dr hab. Agnieszka Szopa

1Chair and Department of Pharmaceutical Botany, Jagiellonian University Collegium Medicum in Cracow, Poland 2Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, Cracow, Poland

**Introduction:** Extracts from plants rich in bioactive compounds are effective in protection of inflammation processes which are an important risk factors in the pathogenesis of numerous chronic diseases. The object of the study was watercress - *Nasturtium officinale* R. Br. (Brassicaceae). Herb of this plant species possesses scientific proven activities e.g. antioxidant, hepatoprotective and anticancer, conditioned by a rich chemical composition (glucosinolates, phenolic acids and flavonoids). The aim of this study was to investigate the anti-inflammatory potential of biomass extracts from *N. officinale* bioreactor's microshoot cultures. Additionally the comparison of the extracts from in vitro cultured microshoots with the extracts of parent plant was performed.

**Methods:** Under the experiment the *N. officinale* microshoot cultures were maintained on liquid Murashige and Skoog (MS) medium supplemented with 1 mg/l 6-benzyladenine and 1 mg/l 1-naphthylacetic acid in RITA® bioreactors (Vitropic, France). The culture grown over 10 and 20-days periods (3 series). Under the analysis the methanolic extracts from lyophilized biomass of in vitro cultures and of in vivo harvested herb of parent plant (Botanic Garden of Medicinal Plants, Faculty of Pharmacy, JUMC, Cracow, Poland) were subjected. For the evaluation of anti-inflammatory activity, tests based on the in vitro inhibition of: 15-lipoxygenase (15-LOX), phospholipase A2 (sPLA2), cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) enzymes (Cayman Chem. Co.), were applied.

**Results:** Evaluation of 15-LOX inhibition showed that *N. officinale* herb and microshoot culture extracts (10 days growth period) moderately inhibited this enzyme: 20%—herb (18.4 µg/ml), 16%—microshoot cultures (17.5 µg/ml), respectively. The most promising results were obtained for inhibitory of COX-1 and COX-2 enzymes activities. *N. officinale* herb extracts; at 1.7 µg/ml – for COX-1 and at 17.2 µg/ml for COX-2, inhibited these enzymes in 43% and 41%, respectively. Microshoot culture extracts showed similar activity at concentration 16.4 µg/ml for COX-1 (equal 41%). The highest potential of microshoot extracts (inhibition equal 75%), was shown for COX-2 at 1.6 µg/ml. *N. officinale* herb and bioreactor microshoot extracts were not active against sPLA2 enzyme.

**Conclusions:** The anti-inflammatory activity of biomass extracts from *N. officinale* bioreactor's cultures under this study were examined for the first time. Extracts from in vitro cultures showed the higher and/or similar anti-inflammatory activity in comparison to plant material.

**Keywords:** *Nasturtium officinale*, anti-inflammatory activity, RITA bioreactor, bioreactor grown microshoot cultures, 15-LOX, COX-1, COX-2, sPLA2.

## THE ANTIOXIDANT POTENTIAL OF BIOMASS EXTRACTS FROM NASTURTIUM OFFICINALE MICROSHOOT CULTURED ON DIFFERENT VARIANTS OF MURASHIGE AND SKOOG MEDIUM

Marta Klimek-Szczykutowicz, Agnieszka Szopa, Michał Dziurka, Halina Ekiert

**Scientific supervisor:** Dr hab. Agnieszka Szopa

1Chair and Department of Pharmaceutical Botany, Jagiellonian University Collegium Medicum in Cracow, Poland 2Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, Cracow, Poland

**Introduction:** *Nasturtium officinale* R. Br. is partially protected in Poland perennial water plant. *N. officinale* herb possesses scientific proven activities such as: antioxidant, hepatoprotective and anticancer, conditioned by a rich chemical composition of bioactive metabolites, e.g. glucosinolates, phenolic acids and flavonoids. The aim of the study was to investigate the impact of plant growth regulators (PGRs) on antioxidant activity of *N. officinale* agar microshoot cultures and comparison with antioxidant activity the parent plant material.

**Methods:** Under the experiment, solid Murashige-Skoog (MS) medium variants were supplemented with PGRs in the concentrations of 1 mg/l each, cytokinin and auxin, in combinations: BA and NAA, 2iP and NAA, KIN and IAA, KIN and IBA, Zea and IBA, Zea and NAA. The tested culture growth periods lasted: 10, 20, 30-days (3 series). The material: microshoots and herb of parent plant, were lyophilized before analysis. The antioxidant potential was measured using: CUPRAC, FRAP, DPPH and Folin-Ciocalteu, methods. The amounts of antioxidants were expressed as trolox equivalent in mmol/100g of dry weight(DW).

**Results:** The antioxidant potential examined with the CUPRAC method ranged from 2.44 (KIN and IBA, 20 days) to 4.13 mmol trolox/100gDW (KIN and IAA, 30 days). The highest antioxidant potential of microshoots measured with CUPRAC method was similar to parent plant material (4.45 mmol trolox/100gDW). For FRAP method antioxidant activity varied from 0.52 (2iP and NAA, 10 days) to 1.03 mmol trolox/100gDW (KIN and IAA, 30 days). The highest antioxidant potential of microshoots measured with FRAP method was 1.4-times higher than of parent plant material (0.76 mmol trolox/100gDW). The antioxidant potential evaluated with DPPH method ranged from 17.91 (Zea and IBA, 30 days) to 30.89 mmol trolox/100gDW (KIN and IAA, 30 days). The highest antioxidant potential measured with DPPH method of microshoots was 1.2-times higher than in parent plant material (26.32 mmol trolox/100gDW). The total polyphenol contents measured by Folin-Ciocalteu method ranged from 3.23 (Zea and NAA, 30 days) to 8.69 mmol trolox/100gDW (Zea and NAA, 10 days). The highest polyphenol content of microshoots was 3.2-times higher than in parent plant material (2.70 mmol trolox/100gDW).

**Conclusions:** The performed studies, confirmed for the first time the explicit influence of PGRs on antioxidant activity of biomass extracts from *N. officinale* microshoot cultures. Extracts from *N. officinale* in vitro cultures revealed the higher and/or similar antioxidant potential compared to the plant material.

**Keywords:** *Nasturtium officinale*, antioxidant activity, agar microshoot cultures, CUPRAC, FRAP, DPPH, Folin-Ciocalteu.

## MATERNAL AND NEONATAL VITAMIN D STATUS AND ITS INFLUENCING FACTORS

Evelin Polanek, Edina Horváth, Andrea Szabó, Hajnalka Orvos, Edit Paulik

**Scientific supervisor:** Andrea Szabó

Department of Public Health, Faculty of Medicine, University of Szeged, Hungary; Department of Obstetrics and Gynecology, Faculty of Medicine, University of Szeged, Hungary

**Introduction:** Vitamin D (VD) hypovitaminosis is a global issue: approximately 70% of world's population has VD level  $<75$  nmol/L; it not only affects adult population but children as well. According to previous international studies, low VD level may be associated with perinatal complications, which emphasises the importance of VD supplementation during pregnancy. The aim of our study is to evaluate VD serum level among pregnant women from Szeged (Hungary), and its potential influencing factors, including diet, vitamin intake, month of birth and outdoor time.

**Methods:** The study was conducted at Szeged. Primary data were collected by self-reported questionnaires and maternal and neonatal serum VD levels were measured. Additional information was provided from patient documentations. Present data show the results of 34 premature and 66 term pregnancies. Data assessment was performed with IBM SPSS 24.0.

**Results:** According to serum VD levels, only 11% of women reached the optimal ( $\geq 75$  nmol/L) and another 37% the adequate (50.0-74.9 nmol/L) VD level, however, 31% of neonates came under the optimal category. None of the assessed mothers took sufficient VD via diet or prenatal vitamins alone, supplementary VD intake was needed. By aggregating vitamin D intake (i.e. diet, VD containing prenatal vitamins and additional VD) 13% of women reached the optimal ( $\geq 37.5$   $\mu\text{g/day}$ ) level. Aggregated VD intake correlated significantly to maternal and neonatal serum VD levels ( $p < 0.001$  and  $p = 0.002$ ). Combined intake of VD and omega-3 fatty acids resulted in a significantly higher maternal and neonatal VD level ( $p = 0.002$  and  $p = 0.003$ ). Month of birth correlated with maternal and neonatal VD levels ( $p = 0.01$  and  $p = 0.003$ ). Nonetheless, the mean outdoor time during the spring-summer period was higher (3.99 hours/day) than the recommendation, no connection was found between serum VD levels and outdoor spent hours.

**Conclusions:** VD status of included women was poor, additional VD intake would be needed in order to reach the optimal VD levels. Due to lack of Hungarian data and small sample size further investigation is required. Improvement of dietary literacy and consciousness is necessary. The research work is financed by the Research Fund of University of Szeged, Faculty of Medicine – Géza Hetényi Grant.

**Keywords:** vitamin D, pregnancy, vitamin supplementation.

## **BACTERIAL AETIOLOGY OF CHRONIC OTITIS MEDIA WITH EFFUSION IN CHILDREN**

Karolina Kielbik, Izabela Korona-Glowniak, Agata Wisniewska, Grazyna Niedzielska, Anna Malm

**Scientific supervisor:** Izabela Korona-Glowniak

1st, 2nd, 5th Department of Pharmaceutical Microbiology, Medical University of Lublin, Poland 3th, 4th Department of Pediatric Otolaryngology, Phoniatrics and Audiology, Medical University of Lublin, Poland

**Introduction:** Otitis media with effusion (OME) may occur spontaneously because of poor eustachian tube function or as an inflammatory response following AOM. Bacterial involvement in OME has been widely reported, with various available methods to identify pathogens from middle ear effusion, including traditional culture methods and polymerase chain reaction (PCR). Therefore, the primary goal of this study was to evaluate the bacteriological profile of middle ear effusion in OME. Risk factors of the bacterial OME aetiology were also identified.

**Methods:** Middle ear effusions (MEF) from 50 children, aged 2-8 years, diagnosed by ENT and undergoing routine tympanostomy tube placement were collected. MEF samples were streaked on standard microbiological media. Next, DNA was isolated from MEF samples and analysed with multiplex PCR for *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis* and *Alloiococcus otitidis*.

**Results:** Positive culture results were reported only for 6 (10%) children - *S. pneumoniae* (6%), *S. aureus* (4%) and CNS (2%). In multiplex PCR assay 37 (74%) of 50 children were positive for at least one of the four microorganisms. In 27.0% positive children multiple bacterial pathogens were identified. *A. otitidis* was the most frequently identified in positive MEF children (59.5%). By multiplex PCR, *H. influenzae*, *S. pneumoniae* and *M. catarrhalis* were detected in 24%, 18% and 8% of OME patients, respectively. There were significant associations between bilateral infection and *H. influenzae* aetiology of OME and unilateral OME with *S. pneumoniae* aetiology.

**Conclusions:** Overall we found OME predominantly a single otopathogen infection caused mainly by *A. otitidis*, which is difficult in identification using standard culture method, ahead to *S. pneumoniae* and *H. influenzae*. However, one third of MEF samples had multiple bacterial pathogens. Definitely, PCR was more sensitive method for searching of OME infection etiology in MEF samples.

**Keywords:** otitis media with effusion, otopathogens, risk factors.

## CLINICAL FEATURES AND THERAPEUTIC PERSPECTIVES ON GASTRIC STROMAL TUMORS- CASE REPORT

Anastasia Padureanu, Rebeca Petrea, Calin-Cristian Costea

**Scientific supervisor:** Dr. Sergiu Padureanu

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Background:** Gastric stromal tumors (GST) are a part of gastrointestinal stromal tumors group which predominantly metastasize hematogenously or by peritoneal dissemination. These are rare tumors, with malignant potential, with an incidence of 1-3/100.000 persons a year. The most common localization is in the stomach (50-70%) and in the small intestine (20-30%), rarely developed in other segments of the digestive tract.

**Case Report:** The patient RM, 62 years old, diagnosed with stage III essential hypertension, grade III obesity and chronic alcoholism, was admitted with the following symptoms: hematemesis, melena, dizziness, fatigue, sclero-tegumentary pallour, with a 24 hour debut. On admission, the patient was hemodynamically stable, the laboratory evidence displaying only a secondary anemia (Hb = 7.8 g / dl, Ht = 23.6%). Abdominal echography revealed, along with the hepatomegaly with hepatic steatosis, the stomach containing near the gastric angle a hypo-echogenic mass, with 31/41 mm in size; the upper digestive endoscopy revealed a protrusive formation at the gastric angle with active bleeding and blood clots; the upper gastrointestinal series indicated at the antrum, a lacunary image, with a polylobulated aspect, then a vertical gastric fold, located before the lesion. The established presumptive diagnosis was antral hemorrhagic gastric neoplasm. The surgeon performed a subtotal gastrectomy with a Reichel-Polya gastro-jejuno-anastomosis and drainage of the peritoneal cavity. After surgery, the patient presented a prolonged ileus and developed a duodenal stump fistula flow on the subhepatic drain and, subsequently, on the abdominal surgical wound. Primarily there was a parietal suppuration, associated with a purulent secretion, which later assumed a digestive aspect, followed by a Klebsiella pneumoniae infection. After the antibiotic therapy, parenteral nutrition and a fistulous orifice prosthesis, the patient's evolution took a favorable turn, and full oral nutrition was reintroduced on the 7th post-surgery day. 28 days post-surgery, the patient was declared surgically cured and discharged. The laboratory tests indicated a positive diagnosis for GST, a case of low proliferative activity and probably benign behavior.

**Conclusions:** Gastric stromal tumors are challenging for both doctor and patient due to their malignant potential. However, GSTs can be successfully cured with a surgical approach.

**Keywords:** gastric stromal tumor, GIST, gastrectomy.

## MANAGEMENT OF MERKEL CELL CARCINOMA: CASE REPORT

Anastasia Padureanu, Rebeca Petrea, Calin-Cristian Costea

**Scientific supervisor:** Dr. Sergiu Padureanu

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Background:** Merkel cell carcinoma (MCC) is a rare, potentially lethal form of cutaneous cancer which comes alongside with a higher mortality rate than the malignant melanoma. This type of carcinoma is a neuroendocrine tumor that may appear as a papule, a small red or violet nodule, which exhibits a fast growth within 1-3 months.

**Case Report:** The patient VE, 69 years old, was admitted to hospital with a tumoral mass localized in the outer upper quadrant of the left gluteal region and left inguinal lymphadenopathy. The patient presented a previous history of carcinoma situated in the left gluteal region which had been surgically removed (incision and drainage) 7 months prior. The histopathological examination of the surgical resection specimen revealed a malignant tumor, a carcinoma, with a trabecular pattern of growth and a high mitotic index (>10 mitoses/HPF). This tumoral mass contained necrosis areas and vascular emboli. Further investigation was recommended in order to determine whether it was a secondary cutaneous cancer or a primary undifferentiated tumor. At the moment of admission, the patient had an immobile tumor of 5/3 cm in her left gluteal region, situated above the old surgical scar, with a firm consistency and painful on palpation. The left inguinal lymphadenopathy was described as firm, painless and mobile. Thoracic-abdominal-pelvic CT scan revealed the presence of a lump in the outer upper quadrant of the left gluteal region that was highly suggestive of a recurrent cancer and lymphadenopathy which pointed out its malignancy. The surgical procedure consisted of the tumor excision (0,5 cm excision margins) with a partial ablation of gluteus maximus muscle, drainage and left inguinal lymphadenectomy. Muscular fascicles were not affected by tumoral invasion; however, the lymph nodes displayed metastases with extracapsular invasion. The histopathological examination indicated a poorly differentiated endocrine carcinoma, a Merkel cell carcinoma. The patient had a favorable post-operative evolution; her drain was removed on the 8th post-surgery day and she was discharged on the 10th post-surgery day.

**Conclusions:** MCC is a rare neuroendocrine tumor with possibly fatal consequences. However, an appropriate surgical management can give the patient a favorable prognosis.

**Keywords:** MCC, neuroendocrine carcinoma, metastasis.

## ANTIOXIDANT POTENTIAL OF SCHISANDRA HENRYI – EXTRACTS FROM LEAVES OF INTACT PLANT AND FROM BIOMASS OF IN VITRO CULTURES

Karolina Jafernik, Agnieszka Szopa, Magda Barnaś, Michał Dziurka, Halina Ekiert

**Scientific supervisor:** Prof. dr hab. Halina Ekiert

Chair and Department of Pharmaceutical Botany, Jagiellonian University Collegium Medicum in Cracow, Poland; Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, Cracow, Poland

**Introduction:** Oxidative stress and mutations caused by free radicals are the reasons of many diseases, including cancers. Antioxidant activity of plant extracts is a very desirable attribute in the modern phytotherapy. Recent studies proved that fruits and leaves of *Schisandra chinensis* (Turcz.) Baill. show considerable antioxidant activities. Biological properties of this plant are attributed mainly to dibenzocyclooctadiene lignans and phenolic compounds. The object of this research was another, endemic for Yunann province of China, less known species - *Schisandra henryi* C.B. Clarke. The aim of the study was to investigate the antioxidant potential using in vitro models, of extracts from *S. henryi* microshoot cultures and leaves of the parent plant.

**Methods:** Under the experiment the *S. henryi* agar microshoot cultures were maintained on Murashige-Skoog medium supplement with 1 mg/l BA (6-benzyladenine) and 1 mg/l IBA (indole-3-butyric acid) over 30 days growth periods (3 series). The leaves were harvested from the parent plant in May 2016 (“Clematis” Company, Poland). The antioxidant potential was evaluated using: CUPRAC (cupric ion reducing antioxidant activity), FRAP (ferric reducing ability of palsa), DPPH (1,1-diphenyl-2-picrylhydrazyl) and Folin-Ciocalteu (total polyphenol content) methods. The amounts of antioxidants were expressed as trolox equivalent in nmol/mg of dry weight (DW).

**Results:** The antioxidant activity of microshoot cultures evaluated with CUPRAC method was equal 259 nmol trolox/mg DW, and was 3.8-times higher than for leaves of intact plant (67 nmol trolox/mg DW). For FRAP method antioxidant potential of microshoot cultures was equal 135 nmol trolox/mg DW, and was 5.6-times higher than for parent plant material (24nmol trolox/ mg DW). The antioxidant potential of microshoot cultures evaluated with DPPH method was equal 176 nmol trolox/mg DW, and was 3.3-times higher than for leaves (53 nmol trolox/mg DW). The total polyphenol content in in vitro cultured biomass measured by Folin-Ciocalteu method was equal 370 nmol trolox/mg DW, and was 4.1-times higher than in leaves (90 nmol trolox /mg DW).

**Conclusions:** This is the first report documented the high power of extracts from *S. henryi* microshoots cultured in vitro

**Keywords:** *Schisandra henryi*, *Schisandra chinensis*, antioxidant activity, microshoots, in vitro cultures, CUPRAC, FRAP, DPPH, Folin-Ciocalteu total polyphenol content.



**ANTI-INFLAMMATORY ACTIVITY OF EXTRACTS FROM LEAVES OF SCHISANDRA HENRYI AND FROM MICROSHOOTS CULTURED IN VITRO**

Karolina Jafernik, Agnieszka Szopa, Michał Dziurka, Halina Ekiert

**Scientific supervisor:** Prof. dr hab. Halina Ekiert

Chair and Department of Pharmaceutical Botany, Jagiellonian University Collegium Medicum in Cracow, Poland; Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, Cracow, Poland

**Introduction:** Inflammation is a body defense process developing after the influence of a damaging factors of different origin, e.g. biological, chemical and physical. Many bioactive plant's derived extracts show anti-inflammatory activities, which is increasingly used in modern phytotherapy. The object of this research was the endemic for Yunnan province of China, species from Schisandraceae family – *Schisandra henryi* C.B. Clarke. So far, a small amount of research has been done on this species. But *S. henryi* has been shown to have a similar biological effect to the pharmacopoeial species - *Schisandra chinensis* (Turcz.) Baill. of scientifically proved anti-inflammatory, adaptogenic, hepatoprotective and antioxidant properties. The aim of the study was an evaluation of the anti-inflammatory activities of extracts from *S. henryi* in vitro cultured microshoots and from leaf extracts.

**Methods:** Under the experiment the *S. henryi* agar microshoot cultures were maintained on Murashige-Skoog medium supplement with 1 mg/l BA (6-benzyladenine) and 1 mg/l IBA (indole-3-butyric acid) over 30 days growth periods (3 series). The leaves were harvested from the parent plant in May 2016 ("Clematis" Company, Poland). For the evaluation of anti-inflammatory activities, tests based on the in vitro inhibition of: phospholipase A2 (sPLA2), 15-lipoxygenase (15-LOX), cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) enzymes (Cayman Chem. Co.), were applied.

**Results:** For *S. henryi* leaf and microshoots extracts inhibited sPLA2 in 19% (164 µg/ml) and 17% (16,93 µg/ml), respectively. Evaluation of 15-LOX inhibition showed that *S. henryi* leaf and microshoots extracts moderately inhibited this enzyme in 27% (18 µg/ml) and in 26% (19 µg/ml), respectively. The most promising results were obtained for inhibition of COX-1 and COX-2 enzymes. Microshoots extracts showed the highest activity at concentration 177 µg/ml; the inhibition of COX-1 and COX-2 reached 76% and 66%, respectively. The maximal inhibition of COX-1 and COX-2 of leaf extracts was equal 70% (171 µg/ml) and 36% (171 µg/ml), respectively.

**Conclusions:** This is the first report documented the anti-inflammatory potential of *S. henryi* leaf and microshoots extracts. Research showed the highest anti-inflammatory potential for microshoot extracts relative to COX-1 and COX-2 enzymes.

**Keywords:** *Schisandra henryi*, anti-inflammatory activity, microshoot cultures, 15-LOX, COX-1, COX-2, sPLA2.

## **A RARE OVARY-ACTION OF THE STROMAL TISSUE: JUVENILE GRANULOSA CELL TUMOUR**

Rebeca Petrea, Anastasia Padureanu, Calin-Cristian Costea

**Scientific supervisor:** Lecturer Elena Cojocaru, MD, PhD

Department of Morphological and Functional Sciences I, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Background:** Granulosa cell tumours of the ovary (GCTs) are rare, hormonally active, estrogen-secreting and unilateral malignant sex cord-stromal tumours. Only 0.1% of all ovarian tumours and 4-5% of GCT occur in children. They are divided into two categories: the adult form and the more infrequent juvenile form. Juvenile GCTs have a favourable prognosis if diagnosed during early stages.

**Case Report:** We report a case of juvenile granulosa cell tumour of the ovary in a 14-year-old female who was initially diagnosed with right ovarian dysgerminoma. She was admitted to the Paediatric Surgery Clinic of "St. Mary" Emergency Hospital for Children Iasi. Computed tomography (CT) of the abdomen and pelvis identified a homogenous fluid-filled mass of 2,35x2,03 cm arising from the left ovary as the dominant follicle. After the mandatory preoperative investigations, she underwent a surgical intervention. The excision product was sent to the Pathology laboratory where the tissue fragments were processed using the classical method of paraffin embedding and Hematoxylin-Eosin staining. The histopathological examination revealed a tumour proliferation consisting of medium-sized cells with coffee-bean like, basophilic nuclei and eosinophilic cytoplasm which were arranged as solid nodules, diffuse cellular regions along with macro and microfollicles. Inside the slightly irregular follicular ducts an eosinophilic secretion was found. The tumour cells were also revealed in the adventitia layer of the left fallopian tube. Immunohistochemistry proved the tumour cells were Calretinin positive while the rate of cell proliferation as assessed by Ki-67 immunoreactivity was 8 mitosis/10 HPF.

**Conclusions:** Subsequent to our previous investigations, we established a final diagnosis of juvenile granulosa cell tumour of the ovary with an adult component. Histopathological diagnosis requires a great deal of expertise in terms of age, treatment and prognosis as JGCTs are rarer than other ovarian tumours.

**Keywords:** juvenile granulosa cell tumour, ovary, histopathology, rare disease.

## **THE INFLUENCE OF METALLOPROTEINASE MMP-2, MMP-9 ON DEVELOPMENT OF PHARYNX AND LARYNX CARCINOMA**

Krzysztof Jędraszek, Angelika Mastalerczyk

**Scientific supervisor:** Dr n. med. Anna Boguszevska-Czubara

Department of Medical Chemistry, Medical University of Lublin, Poland

**Background:** Cancer cells are able to degrade extracellular matrix constituents for their growth and metastasis. Every year galore of people are diagnosed for laryngeal and pharyngeal cancer and half of estimated patients dies. Despite constant development of medicine, patients' mortality is still high, and therefore new therapies in cancer treatment are searched.

**Case Report:** Nowadays metalloproteinases (especially MMP-2 and MMP-9), which are proteolytic enzymes, are gaining popularity for their properties. Research indicates the impact of metalloproteinases on larynx and pharynx carcinoma formation. Metalloproteinases MMP-2 and MMP-9 are zink-dependent endopeptidases. Overexpression of MMPs causes angiogenesis and non-controlled proliferation of cancer cells, because of catalyzing the reaction of degradation of extracellular matrix and basal membrane, which allow to develop and metastasis of carcinoma. Likewise, in that process expression of MMP's natural tissue inhibitors (TIMPs) is inhibited. In larynx carcinoma cells, level of MMPs is significantly higher than in normal cells and the level of TIMPs is also lower. Such situation, which is the lack of metalloproteinases inhibition mechanism results in disturbances in angiogenesis and development of carcinoma metastasis.

**Conclusions:** The level of MMPs and TIMPs are firmly correlated concerning angiogenesis and subsequent formation of carcinoma cells. Regulation of that levels allows to create an inhibiting expression of MMPs and TIMPs medicines. Significant reduce in cancer related mortality can be obtained by employing metalloproteinases mechanisms in clinical treatment.

**Keywords:** metalloproteinases, larynx carcinoma, pharynx carcinoma.

## ANALYSIS OF PARTICLES LOCATION IN COMPOSITE DENTISTRY FILLINGS

Janusz Tarczydło, Bartłomiej J. Zieliński, Emilia Klimek

**Scientific supervisor:** PhD Eng., Monika Ostapiuk<sup>2</sup>, PhD. Bożena Tarczydło, PhD. Hab. Barbara Tymczyna-Borowicz

Scientific Society at the Department of Conservative Dentistry and Endodontics, Medical University of Lublin, Poland;

Department of Materials Engineering, Faculty of Mechanics, Lublin University of Technology, Poland

**Introduction:** The efforts intended to find a perfect composite material for dentistry fillings are confined to creation of the groups of materials which differ in terms of the kind and amount of filling material which is important with regard to the material quality and strength. Agglomeration and size of particles as well as their location may have a major impact of physico – mechanical properties of filling and of bonding between filling and tooth tissues. The purpose of the study was to carry out the microstructural analysis of composites reinforced by nanoparticles as well as the quantitative analysis of particles location in fillings in terms of particles agglomeration and size prevalence.

**Methods:** Third molars extracted for orthodontic reasons have been used for the studies. Black's class 1 cavities have been prepared in a/m teeth to the depth of 4mm and filled in accordance with applicable principles thereafter using two types composites reinforced by nanoparticles i.e. Essentia (GC) i CeramX One SphereTec (Dentsply) according to manufacturer's recommendations. The studies have been carried out by means of SEM PhenomProX (ThermoFisherScientific) scanning microscope at the voltage of 15 kV and Nikon MA200 (Olympus) optical microscope. Computerized image analysis has been carried out by means of Image Pro Plus software ver. 4.5.0.29.

**Results:** The results also indicate to prevailing presence of class 1 particles from 1?m -10 ?m in the areas of boundary of layers as well as to increased presence of class 2 particles from 10?m -100 ?m at tooth – filling boundary in comparison to central area of the filling. Shape irregularity and compact structure of class 2 particles may contribute to their washout from surface layer and to filling tarnishing. Computer analysis of fillings also indicates to the fact that reinforcing particles tend to occur in increased volume at the boundaries with the tooth and at boundaries of the layers.

**Conclusions:** It has been found that increased presence of particles takes place at tooth – filling boundary as well as at boundary of layers in the both materials. Therefore it is possible to conclude that the degree of polymerization shrinkage is greater on outer edges of material. However, obtained results do not indicate to prevailing presence of individual classes of sizes in examined areas.

**Keywords:** composite fillings in dentistry, microstructure analysis, clusters of particles.

## **EFFECTS OF MAMMALIAN TARGET OF RAPAMYCIN (MTOR) INHIBITORS ON COGNITIVE DEFICITS IN YOUNG ADULT RATS WITH FETAL ALCOHOL SYNDROME (FAS)**

Małgorzata Łopatyńska-Mazurek, Paweł Grochecki, Joanna Filarowska-Jurko, Sylwia Talarek, Jolanta Kotlińska

**Scientific supervisor:** Prof. dr hab. n. farm. Jolanta Kotlińska

Department of Pharmacology and Pharmacodynamics, Medical University of Lublin, Poland

**Introduction:** Ethanol is well known for its teratogenic effects during fetal development. It brings physical, behavioral and cognitive abnormalities in children whose mothers consumed alcohol in pregnancy. This group of disorders are known as Fetal Alcohol Syndrome (FAS). Especially dangerous for the fetus is maternal alcohol consumption during 3rd trimester of pregnancy. This leads to serious brain damage, including impairment in memory, attention and cognition. Recent reports have shown that the mammalian target of rapamycin (mTOR), a serine-threonine kinase, could participate in neurotoxic effects of ethanol and inhibits autophagy (repair processes in the Central Nervous System (CNS)). The aim of the present study was to investigate which of mechanism: mTORC1 and/or mTORC2 or the mTOR-independent autophagic process is involved in repair processes of CNS and may prevent memory and learning impairment in rats with FAS.

**Methods:** The experiment was performed with male Wistar rats. FAS model rats were intragastrically intubated with ethanol (5g/kg, 11.33% v/v), twice a day over postnatal day (PND) 4 to 9. Rapamycin (main selective inhibitor of mTORC1), Torin-2 (unselective inhibitor of mTORC1 and mTORC2) and FK-506 (the mTOR-independent inductor of autophagy) were given intraperitoneally at the dose of 5mg/kg, 1 h before ethanol treatment. The Barnes Maze (BM) test was conducted in young adult (46 PND) rats.

**Results:** Our results demonstrated that ethanol impaired memory and learning processes in the BM test by increasing primary latency (PL) and number of errors (NE) when compared to control animals. Pre-treatment with rapamycin, torin-2 and FK-506 during FAS development decreased the PL and NE in the BM test in the FAS rats, but rapamycin is the most potent.

**Conclusions:** Our results show that pre-treatment with rapamycin best impairs the development of memory and learning disorders in rats with FAS and induction of autophagy by inhibition of mTORC1 brings the best therapeutic effects.

**Keywords:** rapamycin, torin-2, FK-506, mTOR, Barnes maze, memory deficits.

## **LACK OF ASSOCIATION BETWEEN HOTAIR RS1899663-POLYMORPHIC VARIANT AND CLEAR CELL RENAL CELL CARCINOMA EMERGENCE AMONG UKRAINIANS**

Aliona Kolnoguz, Viktoriia Harbuzova, Andriy Volkohon

**Scientific supervisor:** Prof. Dr. of biological sciences Harbuzova Victoriia

Department of Physiology and Pathophysiology with Medical Biology Course, Medical University of Sumy State University, Ukraine

**Introduction:** Hox transcript antisense intergenic RNA (HOTAIR) is a long non-coding RNA (lncRNA), that occurs epigenetic regulation of different genes expression through the interaction with Polycomb repressive complex 2 (PRC2) and Lysine-specific histone demethylase 1 (LSD1). However, overexpression of HOTAIR is associated with primary tumor growth as well as cancer metastasis including clear cell renal cell carcinoma (CCRCC). Thus it was assumed that rs1899663 single nucleotide polymorphism (SNP) in HOTAIR gene changes its activity and affects cell oncological transformation of renal epithelium cells.

**Methods:** Venous blood of 101 patients with diagnosed CCRCC (mean age [ $\pm$ SD] 55.31 $\pm$ 10.4 year) and 100 control subjects (mean age 77.38  $\pm$  8.49 year) without any oncological process was used for DNA extraction. Polymerase chain reaction-restriction fragment length polymorphism analysis (PCR-RFLP) was the main method of the study. Horizontal electrophoresis in agarose gel was performed for HOTAIR rs1899663 genotypes discrimination. All statistical calculations were performed in SPSS 17.0 (Chicago, IL, USA).

**Results:** The distribution of HOTAIR rs1899663 genotypes in cancer and control groups was following: GG – 39,6%; GT – 52,5%; TT – 7,9% and GG – 35%; GT – 49%; TT – 16% respectively. However, no statistically significant differences were found according to the chi<sup>2</sup>-test ( $P = 0.207$ ). The association analysis was performed in dominant, recessive, over-dominant and additive regression models. There was no link between HOTAIR rs1899663 SNP and CCRCC development both in crude models as well as after the adjustment for sex, age and smoking ( $P > 0.05$ ).

**Conclusions:** No association was found between HOTAIR rs1899663 locus and CCRCC development in Ukrainian population.

**Keywords:** HOTAIR, clear cell renal cell carcinoma, single nucleotide polymorphism.

## **MODERN RADIOLOGICAL METHODS IN THE DIAGNOSIS OF PULMONARY EMBOLISM.**

Aleksandra Leśniewska, Justyna Pałka, Joanna Kurzepa

**Scientific supervisor:** Dr n. med. Joanna Kurzepa

Students Scientific Association at the 1st Department of Medical Radiology, Medical University of Lublin, Poland

**Introduction:** Pulmonary embolism (PE) is defined as mechanical closure of a part of the pulmonary arterial vascular bed. The most common cause of PE is thrombus, rarely an embolus (e.g. elements of bone marrow, fat, cancer cells). Rapid and properly conducted diagnostics is crucial in the prognosis of patients with PE. Computed tomography angiography (CTA) is currently the gold standard in radiological diagnosis of PE, especially in patients with high and medium clinical risk. Modern dual-energy CT (DECT) has the potential to improve the detection and follow-up of pulmonary emboli.

**Methods:** The paper presents an analysis of the literature on the use of CTP in PE diagnostics, with particular emphasis on DECT. A review of the scientific literature indexed in the PUBMED database from the last 10 years was carried out. The work was illustrated by examinations from the 1st Department of Medical Radiology, Medical University of Lublin and from scientific publications.

**Results:** Multi-row computed tomography in the angiographic protocol is an easily available, non-invasive and fast diagnostic method that allows the detection of PE with high sensitivity and specificity. The test is performed with intravenous injection of a high iodine contrast agent with the reference scan technique allows real-time monitoring of contrast bolus inflow into the pulmonary arterial bed. The PIOPED II study showed high sensitivity and specificity of CTA of about 83% and 96% in the diagnosis of PE. The extension of the CTA examination protocol to venography allows a rapid comprehensive assessment for thromboembolic disease. The introduction of modern DECT scanning technique has allowed new morphological and functional information to be obtained in PE patients. Applying iodine-dependent maps, perfusion images and scans at various energy levels allow to improve the detection of small contrast defects in the subsegmental arteries and the accompanying disorders of pulmonary parenchymal perfusion.

**Conclusions:** DECT, which is increasingly used in the diagnosis of PE, has the capacity to improve the diagnostic accuracy of PE in radiological imaging.

**Keywords:** pulmonary embolism, dual-energy computed tomography, computed tomography angiography.

## THE EFFICIENCY OF THE PANORAMIC DENTAL X-RAY AS A SCREENING METHOD IN EARLY DIAGNOSTICS OF CARIES, ITS COMPLICATIONS AND PERIODONTAL DISEASES

Yelyzaveta Shmatova, Anastasia Liakh

**Scientific supervisor:** Assoc. Prof. Tatyana Kamina

Department of Therapeutic Dentistry, Kharkiv National Medical University, Ukraine

**Introduction:** Caries, its complications and periodontal diseases are the most widespread dental diseases that are diagnosed in 99% of the population of middle and old age. Therefore, with respect to this statistics, the primary and secondary prevention of these diseases is the most current task of modern therapeutic dentistry. Modern protocols of rendering the dental help include mandatory annual routine dental examination as a type of secondary prevention. Annual examination consists of two main parts: subjective (patient's complaints collection, doctor's questionnaire survey conduction) and objective (visual and instrumental examination of the oral cavity tissues). Unfortunately, patients complaints and visual symptoms of pathology appear much later during the disease development. Therefore we consider it beneficial to offer to add the usage of a panoramic dental X-ray as screening method to the protocol of mandatory annual routine dental examination.

**Methods:** Clinical research was conducted in affiliation with the Department of the Therapeutic dentistry of Kharkiv National Medical University and carried out during the time period of September 2018 to March 2019. We held an examination on 33 patients. All of them had panoramic dental X-ray as an additional examination method. Generally accepted classifications were used in diagnostics, evaluation of severity and prevalence of diseases.

**Results:** During the complex dental examination of 33 patients it was found that 60.6% of patients was diagnosed with the signs of primary caries (41 cases in 20 patients) including caries of approximal teeth surfaces (28 cases in 18 patients) in 48% of patients, 81.8% have secondary caries (83 cases in 27 patients), 30.3% have change radiographic picture of inflammation in periapical tissues (15 cases in 10 patients), 72.7% have change radiographic picture of periodontal diseases (localized and generalized forms, 24 cases in 24 patients), 12% have radiological indication of intact periodontal and hard tooth tissues.

**Conclusions:** The obtained data demonstrates a high level of examination efficiency in early caries and periodontal diseases diagnostics during which an additional panoramic dental X-ray had been conducted.

**Keywords:** panoramic dental X-ray, prevention, screening, early diagnostics, caries, periodontal diseases.



## **DEVELOPMENT OF REFLUX ESOPHAGITIS IN PATIENTS WITH ESOPHAGEAL HERNIA**

Tatiana Reva, Volodymyr Reva, Kyrylo Pantsiuk

**Scientific supervisor:** Iftodiy A.G.

Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Ukraine

**Introduction:** The development of reflux esophagitis in patients with esophageal hernia does not lose its relevance. According to our data, reflux esophagitis developed in 61.3% of patients, while in other patients there were no manifestations of esophagitis. The aim was to study the influence of some factors on the development of reflux esophagitis.

**Methods:** Of the total number of patients, 60 with confirmed gastro-esophageal reflux were selected. Of these, 33 patients had reflux esophagitis, and 27 had no manifestations of esophagitis. Intra-esophageal pH-metry was carried out.

**Results:** During performing intra-esophageal pH-metry, a decrease in pH in the lower third of the esophagus below 4.0 was observed in 100% of patients in both groups. The number of reflux incident, within one hour, in patients with reflux esophagitis is twice higher the same as in patients without reflux esophagitis, the total duration of reflux incident was also greater in the first group of patients. There were no incident of reflux lasting more than five minutes in the group of patients without reflux esophagitis. In another group 17 (56.6%) patients had one incident of reflux lasting more than five minutes.

**Conclusions:** The development of reflux esophagitis depends on the duration of contact of the esophageal mucosa with acidic gastric contents. Rare but long-lasting reflux incident have a more destructive effect on the mucosa than frequent but short-lived ones. We have found that in patients with reflux esophagitis, the number of reflux incidents and the total duration of acidic gastric content were twice as high as in patients without reflux esophagitis. However, the stomach pH does not have a decisive influence on the development of changes on the part of the esophagus mucous membrane.

**Keywords:** reflux esophagitis, esophagitis, pH-metry.

## **A RARE CASE OF PERIORBITAL NECROTIZING FASCIITIS WITH SCALP EXTENSION**

Calin-Cristian Costea, Rebeca Petrea, Anastasia Padureanu, Victor-Justinian Solomon

**Scientific supervisor:** Mihaela Pertea MD, PhD

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Background:** Necrotizing fasciitis is rare, but highly lethal. The soft tissue infection spreads rapidly along the necrosis of the superficial fascia and systemic toxicity. Other reports state there have been only 94 cases of periorbital necrotizing fasciitis over the last 20 years. Periorbital necrotizing fasciitis can be clarified into two subtypes according to its microbiological status: type I (due to a polymicrobial infection) and type II to a group A streptococcus with or without staphylococcal infection.

**Case Report:** We present the case of a homeless 67-year-old male, with psychiatric history and alcohol consumption, with facial traumatism 14 days old at the time of submission at the hospital. Clinical examination revealed important edema of the left side of the face with infected wounds around supra-eyebrow, upper eyelid and infraorbital regions as well as subcutaneous emphysema. This aspect extends to the scalp, until the occipital region. For the diagnosis, we used LRINEC (laboratory risk indicator for diagnosis of necrotizing fasciitis), obtaining a score of 9. We performed enucleation of the left eyeball, wide excision of devitalized tissues, fasciectomy, parieto-occipital necrectomy which left the parietal bone exposed. Around the 5th postoperative day, he required a secondary suture and we completed the coverage of the denuded parietal bone through a rotation fascial flap and a free split thickness graft, as in the case of the orbit. The patient presents a psychiatric decompensation and also parieto-occipital fascial flap necroses, which is why we performed a surgical reintervention by removing the periosteum and covering the defect with a free split thickness graft. The patient was discharged after 40 days of hospitalization. The patient was discharged in good condition. Afterwards, he was transferred to the psychiatric clinic to continue the specific treatment. The patient was completely cured in terms of plastic surgery. In addition, he needed to be seen by an ophthalmological team to receive an ocular prosthesis.

**Conclusions:** Necrotizing fasciitis is a rare and very aggressive pathology with a high percentage of mortality, for which the treatment must be established immediately.

**Keywords:** periorbital necrotizing fasciitis, infection, scalp.

## **TECHNICAL PECULIARITIES OF FINGER REPLANTATION IN CHILDREN UNDER 4 YEARS OLD**

Calin-Cristian Costea, Rebeca Petrea, Anastasia Padureanu, Victor-Justinian Solomon

**Scientific supervisor:** Mihaela Pertea MD, PhD

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Introduction:** The amputation of the thumb or any other finger in children has the indication of replantation. Functional results, sensitivity and aesthetic outcomes are better than in adults. The younger the patient, the more difficult reconstructive techniques of bone, tendon and soft tissue repair, vascular or nerve micro anastomosis, postoperative care are. The well-being of the children, their fast social reintegration and satisfaction of the parents, deserve all the needed effort.

**Methods:** The study is based on a total number of 4 cases, all males, involving a 2-year-old child, a 2 year and 10 months one, a 3 year and 2 months patient and a 4-year-old. The first child suffered a ring finger amputation of the proximal phalanx, the second and fourth one had an index amputation of the second phalanx, and the third one an amputation of the medius finger at the level of the second phalanx. The trauma occurred during housekeeping activities such as wood cutting using an axe. Bone repair was difficult due to the need of keeping the growth cartilage intact. The small vessel diameter restrained us from using a 11.0 suture thread and forced us to use the minimum number of stitches. Postoperative analgesia played an important role in preventing vasospasm and increasing the chance of a successful replantation. The splinting was done taking into account the principles of immobilization in children.

**Results:** The results were good considering all of our cases. The 4 year-old-child developed a postoperative venous insufficiency that we managed successfully. The functional and sensitive rehabilitation corresponded to those of a healthy person. Only one case needed a secondary surgical intervention for the reconstruction of the extensor apparatus.

**Conclusions:** Replantation of the amputated finger in children has an absolute indication. The younger the patient the more difficult the surgical repair is, but is counterbalanced by the good functional and aesthetic results.

**Keywords:** replantation, children, vascular anastomoses, finger amputation.

## **FUNCTIONAL AND AESTHETIC RESULTS OF THE NON-MICROSURGICAL RECONSTRUCTION AVULSED THUMB**

Calin-Cristian Costea, Rebeca Petrea, Anastasia Padureanu, Victor-Justinian Solomon

**Scientific supervisor:** Mihaela Pertea MD, PhD

Department of Surgical Semiology, "Grigore T. Popa" University of Medicine and Pharmacy Iasi, Romania

**Introduction:** The evaluation of functional and aesthetic results after primary thumb reconstruction (mobility, sensitivity, strength, cortical reintegration, patient satisfaction) using non-microsurgical reconstruction techniques of the avulsed thumb can have similar results as the microsurgical one.

**Methods:** The study is based on 28 cases of thumb amputation at the level of the first or second phalanx, being associated or not with other fingers trauma. The mechanisms by which the trauma occurred were quite versatile, involving avulsion, crushing, sharp tool and industrial machines. In all cases, primary microsurgical replantation was not possible, and we resorted at unique or associated non-microsurgical techniques. The aim was to obtain a functional, sensitive and aesthetic thumb. Among the 28 cases of avulsed thumb, 19 cases (in 12 cases the amputation was at the distal third of the first phalanx and in 7 cases the amputation was at the interphalangeal joint) benefitted from non-microsurgical techniques such as modified Mantero-Bertolotti technique, using a Littler neurovascular flap instead of O'Brien flap. The other cases required a simple Littler flap (5 cases) and a classic Mantero-Bertolotti technique (4 cases). For another 7 cases the Littler flap had the length of two phalanxes of the third finger and a width of 2,3 cm, adapted to the thumb defect. The size of the flaps was smaller taking into account the remaining cases.

**Results:** The viability of the flaps was good in all cases. The evaluation tested the mobility and stability (bone resorption), the digital pinch (Kapandji scale), the sensibility and cortical reintegration (2PD test and Semmens-Weinstein test) and the aesthetic appearance of the thumb (the patient was asked to complete a satisfaction questionnaire).

**Conclusions:** Microsurgical techniques are of great value and they offer marvelous outcomes. When the microsurgical reconstruction is not possible, we should take into consideration a non-microsurgical technique whose results can be compared with the replantation itself. Their good functional outcomes support this statement.

**Keywords:** replantation, flaps, non-microsurgical, thumb reconstruction.

## THE METHOD FOR THE DESTRUCTION OF MICROBIAL BIOFILMS IN CHRONIC WOUNDS

Yurii Kravchuk, Iryna Kozlovska, Yaroslav Kulachek, Anna Sauliak

**Scientific supervisor:** Iryna Kozlovska

Department of Surgery No 2

Higher State Educational Establishment of Ukraine

«Bukovinian State Medical University», Ukraine

**Introduction:** Chronic wounds (CW) is caused by microorganisms in biofilm and their therapy is ineffective as bacteria in biofilm are 50-100 times more resistant to antibiotics or antiseptics than planktonic forms. The aim of the research was to develop a method of destroying biofilms by electrophoresis and to determine the optimal current density, which would have the best bactericidal effect on the bacteria and destroy the microbial biofilms.

**Methods:** The species and populations of microflora in 83 CW and microorganisms' ability to form biofilms were studied. The density of biofilms was determined by a spectrophotometric wavelength of 570 nM. If the density of the biofilm's flushing solution was up to 0.50 units, the biofilms density was considered low, from 0.51 to 1.00 units - medium and more than 1,01 units – the density of the formed biofilm was considered high.

**Results:** Bacteria isolated in monoculture (*E. coli* and *Ps. aeruginosa*) in 100% cases formed high density biofilm. Bacteria in monoculture exhibit stronger adhesive properties and their biofilms matrix was denser, which better protects them from antimicrobial medicines. Mixed bacteria formed high-density biofilms - from 50.0% to 83.3%, medium density – from 16.9% to 50.3%, low density – from 10.1% to 13.8%. Action of direct current electric field with the density of 0,025 mA/cm<sup>2</sup> didn't have a bactericidal effect on cells in the biofilm, although the density of the latter decreased by an average of 1.5 times. With increase of electric density to 0,05-0,1 mA/cm<sup>2</sup> the biofilm matrix was destroyed more intensively, its density decreased from high to middle and low. This led to the death of bacteria, which caused their decrease in destroyed biofilm from 10.7 to 56.4 times ( $p < 0.05$ ).

**Conclusions:** The formation of microbial biofilms complicates antimicrobial therapy and determines the chronic nature of the wound process. So treatment of CW should include not only antibiotic therapy, but also new methods of influencing biofilms of appropriate density. In complex treatment of CW we recommend to conduct an electrophoresis with a current density of 0,05-0,1 mA/cm<sup>2</sup>, and antibacterial therapy should be designed with the previously investigated sensitivity isolated from the wound of microorganisms in a biofilm.

**Keywords:** biofilms, density, electrophoresis, chronic wound.

## TREATMENT OF CHRONIC TROPHIC VENOUS ULCERS USING VAC-THERAPY OF NEGATIVE PRESSURE

Oksana Komar, Oleh Rusak, Andriy Iftodiy

**Scientific supervisor:** Rusak Oleh Bohdanovych

Higher State Educational Establishment of Ukraine «Bukovinian State Medical University», Ukraine

**Introduction:** The main reason of chronic ulcers is insufficient of tissue trophic, due to the problems of venous outflow and arterial blood supply. The efficacy of traditional methods of treatment is low and reaches 10%, and the incidence of recurrence of ulcer after surgery is noted in 31% of patients. The use of VAC-therapy in the treatment of trophic ulcers of the lower extremities of different genesis is one of the promising ways of solving this problem, as it effects on the main pathological links of development of the ulcers, especially at insufficiency of microcirculation and tissue trophies. Aim: To study the clinical efficacy of local prolongation VAC-therapy with use of variable-pressure in the treatment of venous trophic ulcers.

**Methods:** 45 patients with chronic venous insufficiency were treated. In comparison group (15 patients) we used traditional therapy of trophic ulcers - surgical treatment of the wound with excision of necrotic tissues, application of antiseptics and the bandage with water-based antiseptic ointments was applied. In the main group (30 patients) used a comprehensive VAC-therapy, were the main stage was optimal surgical treatment of the wound, followed by treatment with low-dose of negative pressure.

**Results:** The VAC-therapy effect of variable-pressure is expressed in the increase of peripheral perfusion, increased lymphatic outflow, peripheral perfusion and finally rapid wound healing. Subjectively in all patients noted a decrease or disappearance of pain and heaviness in the legs, the appearance of granulation and an increase in epithelialization. As a result, the average length of stay in the hospital before skin grafts was reduced from  $19.7 \pm 0.4$  to  $11.6 \pm 1.4$  days ( $p=0.004$ ), the total length of hospitalization was from  $22.8 \pm 3.8$  to  $15.1 \pm 1.9$  days ( $p=0.043$ ).

**Conclusions:** The use of local prolongation VAC-therapy with use of variable-pressure is a promising method in the complex treatment of patients with venous ulcers. This method can significantly improve all the basic indicators of treatment and healing of ulcer defects, improves the wound repair processes. VAC-therapy has a pronounced positive effect on the general condition of patients in the form of increasing tolerance to stress, reducing pain, and improving general well-being.

**Keywords:** VAC-therapy, trophic ulcers, venous insufficiency, variable-pressure.

## **RADIOLOGICAL IMAGING OF BROWN TUMORS**

Agata Rocka, Faustyna Piędel, Klaudia Pagacz, Dominika Madras, Jakub Pierzchała, Joanna Kurzepa

**Scientific supervisor:** Prof. Elżbieta Czekajska-Chehab

Students Scientific Association at the 1st Department of Medical Radiology, Medical University of Lublin, Poland

**Introduction:** Brown tumors (BTs) belong to non-neoplastic bone changes occurring in the course of metabolic disorders (hyperparathyroidism, HPT). Elevated level of parathyroid hormone causes rapid osteoclastic turnover of bone. Local repair processes result in bone marrow replacement by proliferating granulation, vascular and fibrous tissue, resulting in BT. BTs occur with a frequency of 1.5% to 1.75% in secondary hyperparathyroidism and from 3% to 4% in primary hyperparathyroidism.

**Methods:** The results of imaging tests from the 1st Department of Medical Radiology, Medical University of Lublin and information available in the literature were analyzed.

**Results:** BTs are located the most often within the long bones (ribs, collarbone, tibia), vertebral bodies and in the iliac wings. Head and neck (mainly the lower jaw) may be a rare location of BT, which in some cases leads to significant facial deformities as well as respiratory disorders and difficulties in feeding. Among the imaging tests in the diagnosis of BT mainly the following are used: x-ray (XR), computed tomography (CT) and nuclear medicine exams. Radiologically, BTs most often manifest as single or multiple, well demarcated osteolytic lesions, often accompanied by local thinning of the cortical layer of the bone and its distension. In scintigraphy with <sup>99m</sup>Tc- sestamibi it has increased radiolabel uptake. Magnetic resonance imaging (MRI) shows multi-localized destructive tissue damage with high T2 and indirect T1 signal.

**Conclusions:** In diagnostic proceedings in patients with suspected brown tumor, the correlation of radiological symptoms with clinical history (HPT, renal osteodystrophy) and laboratory tests (calcium and phosphate disorders) is extremely important. If there is any doubt about the final diagnosis, a biopsy of the suspected lesion is recommended. Treatment consists in normalizing calcium phosphate disorders and constant endocrine control. In rare cases associated with severe course, large extent of lesions and severe bone deformities, resection of the lesion is necessary.

**Keywords:** brown tumor, hyperthyroidism, metabolism, osteolysis, radiology.

## **BETTER LATE THAN NEVER: A DELAYED TREATMENT OF COMMON VARIABLE IMMUNODEFICIENCY**

Anastasia Padureanu, Alexandra Stefan, Rebeca Petrea, Calin-Cristian Costea

**Scientific supervisor:** Dr. Liliana Padureanu

Department of Allergology and Clinical Immunology, Emergency Clinical Hospital "St.Spiridon" Iasi, Romania

**Background:** Common variable immunodeficiency (CVID) is one of the most frequently diagnosed immunodeficiencies, especially in adults, characterized by a heterogenous subset of hypogammaglobulinemias of unknown etiology. The most common symptoms are severe, recurrent and sometimes chronic bacterial infections mainly of the respiratory and gastrointestinal tracts and a significant proportion of CVID patients develops additional autoimmune, inflammatory or lymphoproliferative complications.

**Case Report:** We present the case of a 53-year-old female with a medical history of common variable immunodeficiency, bronchiectasis, megaloblastic anemia, vitiligo and total thyroidectomy, who was hospitalized for a biological and clinical evaluation and treatment planning for immunological deficiency. Although the patient had been diagnosed with common variable immunodeficiency 15 years prior to her current hospital admission, she hasn't received the immunoglobulin replacement therapy before. Physical examination revealed substantial weight loss (BMI:14,38), rapid intestinal transit with loose stools and right basal crepitations. During hospitalization, the patient displayed fever (39°C) in the context of a respiratory infection which was successfully managed by administering Moxifloxacin for 7 days. Laboratory tests indicated the presence of inflammatory markers, leukocytosis, agammaglobulinemia, iron deficiency and elevated ferritin levels and anemia. The patient also underwent upper endoscopy and duodenum biopsy which helped us diagnose her with Marsh 3a celiac disease. Consequently, she started a gluten-free diet that ameliorated her gastrointestinal symptoms and she was administered iron deficiency treatment as well as immunoglobulin therapy. The patient was provided every month with human immunoglobulin (0,8g/kg) that led to a favorable evolution and significantly improved her quality of life. However, she occasionally displayed vesperal fever episodes and productive cough. On the fourth immunoglobulin therapy session, the patient provided a sample for the sputum test which came back positive for Mycobacterium tuberculosis. CT scan confirmed the diagnosis of miliary tuberculosis and a treatment with 4 antibiotics was immediately started.

**Conclusions:** The case presented here emphasizes the main potential complications of a CVID that hasn't been managed properly, with a 15-year delay in treatment administration. Not only early diagnosis but also early treatment are the keys to avoiding severe complications and improving prognosis in patients with common variable immunodeficiency.

**Keywords:** common variable immunodeficiency, immunoglobulin therapy, infectious complications.



**ANTIOXIDANT ACTIVITY OF SELECTED PLANT SEMI-FINISHED PRODUCTS USED FOR PRODUCTION OF ANTI-AGING COSMETIC**

Sylwia Zarzycka, Dominika Nurzyńska, Wioleta Pietrzak, Aleksandra Pieczykolan, Renata Nowak

**Scientific supervisor:** -

Chair and Department of Pharmaceutical Botany, Medical University of Lublin, Poland

**Introduction:** Plant extracts currently represent one of the most numerous and most highly valued groups of ingredients used in the cosmetic industries. A number of studies have shown that plant ingredients exhibit antibacterial, antiviral, antifungal, and anti-inflammatory activity. Also plant extracts are used as natural antioxidants.

**Methods:** The aim of the presented study was to determination of the antioxidant activity of selected semi-finished products of plant origin available on the polish market, used in the production of anti-age cosmetic preparations. The tested products were divided into hydrolates (liquid intermediates) and plant extracts (intermediates in the form of powder). The antioxidant activity was measured using two methods: by the DPPH(2,2-diphenyl-1-picrylhydrazyl) method with some modifications [Olech et al., 2012; Brand-Williams et al., 1995] and an improved ABTS+ decolorization assay [Pieczykolan et al. 2019; Re et al., 1999].

**Results:** The results of antioxidant activity measured by the DPPH method show that the low EC 50 values, so high antioxidant activity, were found for extracts obtained from green tea ( $0.046 \pm 0.002$  mg dry extract ml<sup>-1</sup>), green coffee (EC 50 value was  $0.156 \pm 0.005$  dry extract ml<sup>-1</sup>) and from rose fruit ( $0.163 \pm 0.002$  dry extract ml<sup>-1</sup>). The highest EC50 values, so low ability to inactivate free radicals, were determined in extracts of young wheat juice and young barley juice (123.302 and 175.319 mg of dry extract per ml, respectively). Similarly in the modified ABTS + method, extract from green tea showed the highest antioxidant activity ( $6.668 \pm 0.246$  mM Trolox per g dry extract) and extracts from young wheat juice and young barley juice the lowest antioxidant activity (EC 50 - 0.003 mM Trolox per g dry extract).

**Conclusions:** The plants material are a rich source of ingredients with antioxidant activity. The active compounds from plants have the ability to scavenge free radicals, whose excess may contribute, among others to accelerate the aging process of the body. Plant extracts also perform nourishing and skin regenerating functions and can be valuable ingredients in anti-age preparations.

**Keywords:** antioxidant activity, plant extracts, DPPH, ABTS+.

## ANTIOXIDANT ACTIVITY OF COSMETICS CONTAINING ROSE EXTRACTS

Wojciech Ziemichód, Sylwia Podstawka, Wiktoria Lachor, Marta Olech

### Scientific supervisor:

Chair and Department of Pharmaceutical Botany, Medical University of Lublin, Poland

**Introduction:** Antioxidants are compounds which can eliminate free radicals and have beneficial effect on organism. Free radicals cause many diseases as well as skin aging. Cosmetics which contain plant extracts rich in antioxidants help to maintain skin young and nourished. Since the ancient times people have known good properties of roses. Nowadays roses are used in cosmetology because of good influence on skin, ability to reduce acne, to stimulate the synthesis of collagen etc. Moreover, rose hips are rich in ascorbic acid and provitamin A. Rose extract can be found in cosmetic rose absolute, rose oil, rose water. Previous studies have shown that rose extracts have strong antioxidant potential. Therefore, the aim of this study was to test the antioxidant activity of various cosmetics containing rose extracts or rose oil. Moreover, antioxidant potential of cosmetic products was compared with the activity of extracts prepared from rose hip and petals.

**Methods:** Fourteen cosmetics available in Poland including four herbal distillates, three tonics, one gel, two flower waters, one face cream and three herbal oils were studied. The ethanolic extracts from rugosa rose (*Rosa rugosa* Thumb.) hips and petals were prepared by the use of maceration followed by the ultrasound assisted extraction. The activity of cosmetics and plant extracts was tested using two spectrophotometric assays, with DPPH (2,2-diphenyl-1-picrylhydrazyl) and ABTS (2,2'-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid) radicals.

**Results:** We have found that ethanol extracts from petals and hip of *Rosa rugosa* L. have strong antioxidant properties. Rose petals extract has a higher degree of radical reduction than extract from rose hip. Comparing the level of radical reduction of cosmetics we may observe it is much lower than the activity of rose extracts. It was noticed that herbal distillates from ecological producers showed much higher activity than herbal distillates from drugstores.

**Conclusions:** Some cosmetics contain rose oil and their antioxidant potential is not high. This is probably due to the presence of other ingredients and the quantity and quality of the components used. The most active cosmetic products were found to be the ones of organic origin and those with rose extract at the beginning of the list of ingredients.

**Keywords:** rose, rose petals, rose hip, cosmetics, antioxidants, skin aging.

**Psychiatry, Psychology and Human  
science in Medicine, Neurology and  
Neurosurgery**

## **INTERNET-ADDICTION IN THE SOCIAL NETWORKS PROJECTION: PSYCHOLOGICAL PECULIARITIES OF USERS, WHO CONSIDER THEMSELVES AS BLOGGERS**

Tetiana Ivanitska

**Scientific supervisor:** PhD, MD, Prof. Olena Venger

Department of Psychiatry, Narcology and Medical Psychology, Ternopil National Medical University named after Ivan Horbachevskyi Ministry of Health of Ukraine, Ukraine

**Introduction:** Target of our work – to investigate the psychological characteristics (level of sociability, social frustration, self-esteem, anxiety, self-attitude, as well as dominant personal radicals) of the social networks users.

**Methods:** 75 students of I-VI years of study were interviewed. Used: 1) test to determine the sociability level (Next: "T1"); 2) method to diagnose social frustration ("T2"); 3) "Mini-Mult" test ("T3"); 4) method of self-esteem ("T4"); 5) questionnaire to determine the personality of the individual ("T5").

**Results:** The students under research were divided into two groups according to the answer "Do you a blogger?": 12 people (16%) who answered "Yes" - group A and 63 people (84%) - "No" – group B. According to the results of the study it was found that "T1" of the group "A" students was mostly high (66.6%). In the group B - overwhelmingly normal (79.3%).

According to "T2" in the group A there was observed reduced or very low level of dissatisfaction with social achievements (83.3%), while in the group B - uncertain level (55.5%) or increased one (31,7%). According to "T3": in group A, hysterical and hypomaniacal personal radical were predominant, while in the group B - schizoidness and hypotension. According to "T4" 75% of students under research from the group A have an unrealistic and uncritical attitude towards their own capabilities, which is an indicator of adverse personality development. 55.5% of students under research from the group B have an optimal view of their capabilities. According to "T5" - the average level of self-esteem was 7% higher in group A than in group B; autosympathy is higher by 15%, respectively; and the level of self-humiliation in the first group is 9% lower than in the second one.

**Conclusions:** Thus, the psychological characteristics of students who consider themselves bloggers are different from ordinary users of social networks. In particular, they have high level of sociability, which is pathological, reduced level of frustration, hysterical and hypomaniacal personal radical are dominated, they have a non-critical attitude to themselves, as well as overestimation of self-esteem and autosympathy.

**Keywords:** psychology, bloggers, Internet, Instagram.

## **DIAGNOSIS AND TREATMENT OF ACUTE ISCHEMIC STROKE IN PREGNANCY AND PUERPERIUM BASED ON TWO CASE REPORTS AND LITERATURE REVIEW**

Antonina Oboz-Adaś, Katarzyna Kuźniar, Anna Karaś, Sylwia Kocór, Krzysztof KuldaneK

**Scientific supervisor:** lek. Marcin Wiącek

Students' Scientific Group of Neurology, Department of Neurology with Stroke Treatment Unit, University of Rzeszow, Poland

**Introduction:** Acute ischemic stroke (AIS) in pregnancy and puerperium is a rare event posing a serious risk for both mother and child. Unlike strict AIS treatment guidelines defined for general population, no optimal management has been elaborated in women during and after pregnancy.

**Methods:** The review is based on overview of researches and scientific papers available on Pubmed and the most recent recommendations and guidelines. The publications have been found using the following key words: acute ischemic stroke, pregnancy, puerperium, labour, thrombolysis, thrombectomy, neuroimaging. Two unique case reports from Neurology Clinic in Rzeszow were also included in this scientific work.

**Results:** First presented 35-week gravid patient aged 27 was diagnosed with proximal occlusion of the left middle cerebral artery causing AIS. Following a caesarean section, the woman was successfully treated with mechanical thrombectomy (MT). The second woman was a 35-year-old multigravida who one day after the labour demonstrated basal artery (BA) occlusion and left vertebral artery dissection. During MT, the recanalization of BA was obtained, however the patient developed malignant brain oedema and acute hydrocephalus. After unsuccessful neurosurgical management the woman died. According to the literature, despite safety of both methods, neuroimaging with head MRI is preferable to CT in pregnancy, still it may be depreciated with regard to sparse availability. During the puerperium, there are no special restrictions on neuroimaging. Thrombolysis can be considered in pregnancy only when benefits exceed the risk of uterine bleeding, but it is contraindicated for 14 days after the labour. Up to date, 8 successful cases of MT in pregnant women have been published. In selected group of patients it seems to be a safe and efficient therapeutic option.

**Conclusions:** AIS diagnosis and treatment in pregnancy is a severe problem and it should be investigated. To the date, MT has proved a safe and efficient option and may become a recommended treatment.

**Keywords:** mechanical thrombectomy, acute ischemic stroke, pregnancy, puerperium.

## **PARENTAL STRESS AND AFFECT IN THE FACE OF AN ONCOLOGICAL CHILDREN DISEASE- PSYCHOLOGICAL ASPECTS**

Natalia Ziólkowska, Kamilla Bargiel-Matusiewicz

**Scientific supervisor:** Dr hab. Kamilla Bargiel-Matusiewicz

1st author: Faculty of Psychology, SWPS University of Social Sciences and Humanities in Warsaw, Poland;

2nd author: Department of Psychology, University of Warsaw, Poland

**Introduction:** A child's oncological disease is an exceptionally difficult event that burdens the whole family system. It causes changes in the functioning of the affected family. According to the statistics, there are 1100-1200 new cases of cancer in patients under 18 years of age each year. An oncological disease triggers various emotions and strategies of coping in this situation.

**Methods:** The aim of the presented study was to analyze the correlation between the experienced affect and the preferred and dominating strategies of coping in the difficult situation among parents of children remaining in active treatment. The study was conducted in pediatric oncology clinics. The participants in the study were 75 parents of children diagnosed with an oncological disease. The Mini-COPE questionnaire as adapted by Juczyński and Ogińska-Bulik (2009) and the PANAS-X Scale as adapted by Krok (2009) were used in the study.

**Results:** The analysis of correlation showed that general positive affect is positively correlated with planning ( $\rho=0.34$ ;  $p=0.003$ ), active coping ( $\rho=0.44$ ;  $p<0.001$ ) and positive overestimation ( $\rho=0.33$ ;  $p=0.004$ ) and negatively correlated with denial and self-blame. In the case of negative affect, positive correlations included denial ( $\rho=0.42$ ;  $p<0.001$ ) and self-blame ( $\rho=0.38$ ;  $p=0.001$ ). In the case of basic emotions, most of them were concerned positive emotions as well. They correlate positively at a statistically significant level with active coping ( $\rho=0.39$ ;  $p=0.001$ ) and searching for emotional support ( $\rho=0.31$ ;  $p=0.008$ ). Negative emotions are positively connected with denial ( $\rho=0.38$ ;  $p=0.001$ ) and self-blame ( $\rho=0.42$ ;  $p<0.001$ ).

**Conclusions:** The study showed that positive affect and positive emotions are mostly connected with adaptive strategies of coping with stress, whereas negative emotions are more frequently related to less adaptive strategies. Therefore, the importance of the availability and meaningfulness of psychological support aimed at parents of children diagnosed with oncological diseases should be emphasized.

**Keywords:** parents of children with cancer, stress, coping with stress, affect.

## POSITIVE VS. NEGATIVE RELIGIOUS COPING AND EMOTIONS AMONG PARENTS OF CHILDREN WITH CANCER- PRELIMINARY STUDY

Natalia Ziólkowska

**Scientific supervisor:** Dr hab. Ewa Gruszczyńska, prof. SWPS University of Social Sciences and Humanities Faculty of Psychology, SWPS University of Social Sciences and Humanities, Warsaw, Poland

**Introduction:** Diagnosis of an oncological disease in children is a very difficult and threatening situation for their parents and the whole family system (Gouvela, Janvier, Dupuis, Duval, Sultan, 2017). Each stage of an oncological disease in children and the related treatment is an experience characterised by strong negative feelings for their parents. It triggers various strategies including also religious ones for coping with this situation.

**Methods:** The aim of the study was to analyze religious strategies of coping with stress and connections between coping with stress and emotions among mothers and fathers of children suffering from oncological diseases during an active treatment process. The study was conducted in the Department of Oncology of the Children's Memorial Health Institute in Warsaw and in the Children Haematology and Oncology Ward of the Medical University of Silesia's Clinical Hospital No 1 in Katowice. The parents were asked to complete Brief Coping-short version adapted by Jarosz, two scales from Mini-COPE in adaptation Juczyński and Ogińska-Bulik, Emotion Questionnaire and an own sociodemographic and clinical questionnaire. 100 parents participated in the study.

**Results:** The hierarchical regression analysis used shows that the level of negative emotions cannot be predicted by the sociodemographic and clinical variables, positive reevaluation, turning to religion and religious coping (none of the regression models was statistically important and the value of the corrected R square turned out to be negative). However, in the case of predicting positive emotions, the 5-step model proved to be best: it predicted 18.4% of the variance. The sociodemographic and clinical variables alone do not create a significant regression model, nevertheless, in the last step, positive reevaluation ( $p=0.001$ ) and negative religious coping ( $p=0.007$ ) proved to be significant predictors.

**Conclusions:** This is a pilot study, but results are interesting and require further exploration and longitudinal studies. However we can see, that an oncological disease in children is a very difficult and stressful situation for the whole family and require psychooncological support.

**Keywords:** cancer, children, coping, religious coping, emotions, parents.

## CHARACTERISTICS OF ANXIETY AND SUICIDAL TENDENCIES AMONG PATIENTS WITH SECONDARY-PROGRESSIVE AND RELAPSING-REMITTING TYPES OF MULTIPLE SCLEROSIS IN LVIV REGION

Sofiiia Fostiak

**Scientific supervisor:** Assoc. Prof. MD, PhD Mariia Shorobura

Department of Neurology, Danylo Halytsky Lviv National Medical University, Ukraine

**Introduction:** Suicidal ideation as a symptom of depression and anxiety particularly are common comorbid disorders that develop in patients with multiple sclerosis (MS) and significantly affect the overall psychosomatic status of patients. The aim of our study was to establish correlation between the severity of state anxiety (SA) and trait anxiety (TA), suicidal tendencies among different subgroups of patients and to discover its prevalence among patients population.

**Methods:** For statistical analysis, a group of patients who admitted for treatment to Lviv Regional Center for Multiple Sclerosis with relapsing-remitting (RR) and secondary-progressive (SP) types of MS were selected (n = 49, PP = 38, SP = 11, women - 38, men - 11, patients age 21-59 years, mean age  $39.62 \pm 7.46$  years, disease duration 1-22 years, mean duration  $9.73 \pm 3.46$  years). All participants signed information consent to participate in the study. Anxiety and suicidal tendencies were assessed using two scales: the Spielberger Anxiety Scale (STAI) and the SR-45 scale for identifying suicidal tendencies.

**Results:** The high level of SA - 34.7%, the moderate level - 42.8%, the low level - 22.5%. Among men, there was an increased SA - 72.7%, low - 27.3%; among women, increased SA - 78.9%, low - 21.1%. The high level of TA - 14.4%, the average level - 44.8%, the low level - 40.8%. Among men increased TA - 81.8%, low - 18.2%; among women, increased TA - 86.8%, low - 13.2%. The correlation coefficient between SA and TA  $r = 0.73843$ . The average incidence of suicidal tendencies is 2.05%, below average is 30.61%, and the low is 67.34%. The correlation coefficient between disease duration and suicidal ideation is  $r = 0.20374$ .

**Conclusions:** Obtained results indicate that the level of anxiety among MS patients is extremely high. There is no significant difference between men and women in gender disaggregation and anxiety is high in both groups. The positive high correlation between SA and TA indicates that it is imperative to consider the correction of anxiety in patients with high levels of TA, since they can develop pathological anxiety such as panic attacks or generalized anxiety disorder. A positive correlation between disease duration and suicidal ideation indicates that long-suffering patients may be more likely to have suicidal thoughts or suicide attempts. It is advisable to involve a psychotherapist in treatment of this group of patients and to consider prescribing antidepressants if necessary.

**Keywords:** multiple sclerosis, anxiety, STAI, SR-45, suicidal tendencies.



## **A CASE OF ISCHEMIC STROKE IN A 3 YEAR OLD CHILD**

Ewa Kopyto, Małgorzata Matuszek, Justyna Lenart, Natalia Kusak, Magdalena Maria Woźniak

**Scientific supervisor:** Magdalena Maria Woźniak PhD, Assoc. Prof.

Department of Pediatric Radiology, Medical University of Lublin, Poland

**Background:** Stroke in children occurs rarely, thus its symptoms are often questioned. The most frequent clinical presentation is an acute focal neurological deficit in the form of hemiparesis. Other symptoms that are often seen are headache, seizures and alteration of consciousness. Risk factors for stroke in children are most often associated with arteriopathy, cardiac disorders, thrombotic states, acute illness and chronic diseases. The gold standard for diagnosing stroke is nowadays diffusion-weighted (DWI), blood-sensitive magnetic resonance imaging (MRI). Antithrombotic treatment is associated with better neurological outcome and reduces the risk of a recurrent event.

**Case Report:** A 3 year old male patient was brought to the hospital emergency department at the University Children's Hospital in Lublin. The patient was confused and had slight right-hand paresis. He underwent a computed tomography (CT) scan in which hyperdense area was visualized in the projection of the division of the left middle cerebral artery (MCA). It corresponded to the occlusion of the vessel in the course of ischemic stroke. Then he underwent an MRI scan. In DWI sequence the diffusion restriction region within the deep left hemisphere structures was seen. In angio-MR a signal loss was seen at the level of division of the left MCA. The patient underwent thrombectomy followed by the improvement of his condition. Follow-up examinations revealed the extensive area of ischemic stroke within the left hemisphere of the brain. After 2 weeks the patient had several seizures, headache and right-sided paresis. CT scan revealed fresh blood in basal reservoir, Sylvian fissure and in intercellular fissure, which indicated a secondary hemorrhage into the area of the stroke. Additional examinations showed a blood clot in the heart. The patient undergoes rehabilitation.

**Conclusions:** The use of modern imaging techniques enables rapid detection of ischemic and hemorrhagic changes in the brain in children. CT scan is a primary modality which allows early diagnosis of ischemic stroke and is a very sensitive modality detecting fresh blood following hemorrhagic events. MRI, particularly especially DWI sequences, enable to diagnose with high sensitivity ischemic stroke from a very early stage with precise determination of its extend and determination of its phase.

**Keywords:** stroke in children, computed tomography, magnetic resonance imaging.

## **ASSESSMENT OF THE PREVALENCE OF EATING DISORDERS AMONGST STUDENTS OF THE MEDICAL UNIVERSITY OF WARSAW AND THEIR IMPACT ON LEARNING OUTCOMES**

Karolina Mikołaj, Kinga Szczepanik

**Scientific supervisor:** Dr n.med. Maja Herman

Student Psychiatry Club of Prof. Jan Mazurkiewicz, Psychiatry Clinic, Medical University of Warsaw, Poland

**Introduction:** Eating disorders are mental disorders which affect a high percentage of the society. Research shows that these patients may strongly strive for success and often be perfectionist. The aim of this study was to estimate the prevalence of eating disorders amongst students of the Medical University of Warsaw and to assess their impact on the achievements in college.

**Methods:** A questionnaire that was conducted was based on the EAT-26 test. A score of 20 or more indicates a higher risk of eating disorders. The questionnaire also included original questions about academic performance and behavioral patterns. 215 responses were collected. The data were analyzed using the Chi-square test and the Fisher test.

**Results:** The study showed that 26 people (12.1%) have been diagnosed with an eating disorder in the past, and 23.26% of polled students scored 20 or more points. Individual analysis showed that 29.2% felt the urge to vomit after meals, and 18% actually did it. 68.4% have gone on eating binges and 81.9% said that they sometimes "think there is too much fat in their bodies". A statistically significant correlations were found between the high EAT-26 score and the female gender ( $p = 0.0057$ ), more time spent on learning ( $p = 0.028$ ) and perfectionism ( $p = 0.0085$ ).

**Conclusions:** Among students of the Medical University of Warsaw, the prevalence of eating disorders is higher than in the general population. An alarming number of students demonstrate incorrect thinking about their own body, vomiting or binge eating. Eating disorders also have an impact on learning.

**Keywords:** eating disorders, medical students, body image, EAT-26, perfectionism, learning.

## STRESS EATING AND SYMPTOMS OF DEPRESSION IN YOUNG PEOPLE

Kalina Kolasińska, Julia Suwalska

**Scientific supervisor:** Dorota Łojko MD, PhD

Department of Adult Psychiatry, Poznan University of Medical Sciences, Poland

**Introduction:** Emotional eating is defined as the propensity to eat in response to aversive or unpleasant affective states. In experimental studies, emotional eaters were found to consume more high-fat snack foods and more sweet-and-fatty foods in response to stress compared with those not classified as emotional eaters. Symptoms of depression have been found to correlate with emotional overeating in response to negative emotions. The aim of the present study was to examine putative associations between emotional eating, depressive symptoms and negative body image in young people.

**Methods:** The study was a cross-sectional survey of 70 students of physiotherapy at Poznan University of Medical Sciences. The group consisted of 25 (36%) men and 45 (64%) women. Three students had previous history of depression, 2 of them did not have symptoms of depression at the time of the study. General health, demographic and lifestyle factors such as smoking and alcohol consumption were gathered by a general questionnaire. Anthropometric variables such as height and weight were also measured. Intensity of depressive symptoms was evaluated with Beck Depression Inventory (BDI). Food Frequency Questionnaire (FFQ-6) and the Three Factor Eating Questionnaire (TFEQ-18) were used to assess dietary habits.

**Results:** Nearly 20 percent of participants had depressive symptoms defined by BDI  $\geq 12$ . Thirteen percent of students had BMI  $\geq 25$ , including 8 individuals who were classified as overweight and 5 as obese. In TFEQ-18, participants with depressive symptoms more often agreed with statements related with stress eating: “When I feel anxious, I find myself eating” (62% vs 26%,  $p < 0.01$ ), “When I feel blue, I often overeat” (46% vs 21%) and “When I feel lonely, I console myself by eating” (28% vs 19%). When asked if they accepted their appearance, people with depressive symptoms were significantly more often “very dissatisfied” or “dissatisfied” (46% vs 7%,  $p < 0.01$ ).

**Conclusions:** The results of the study point to the association of depressive symptoms and stress eating and sense of self-attractiveness. Further research is needed to elucidate the connection between depression and eating habits in a population of young people.

**Keywords:** stress-eating, depressive symptoms, self-attractiveness.

## THE IMPACT OF ANXIOUS AND DEPRESSIVE CONDITIONS ON MANIFESTATIONS OF HEADACHE IN THE STUDENTS OF DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY

Maryana Voloshyn

**Scientific supervisor:** MD, PhD, Sofiia Kirilyuk

Department of Neurology, Danylo Halytskyi Lviv National Medical University, Ukraine

**Introduction:** Headache is one of the most relevant problems of modern medicine. Students and people with intellectual work are at high risk of developing a primary headache, because their lifestyle requires a constant concentration of attention and leads to emotional stress, prolonged uncomfortable head and neck position, lack of physical activity. Aim of the study was to find out a correlation between headache and anxiety-depressive manifestations in I, IV and VI year students of the medical faculty of Lviv National Medical University named after Danylo Halytsky.

**Methods:** 150 I, IV and VI course students (50 people from each year) were examined. Diagnostics of headache was performed using a questionnaire, which was developed on the basis of the International Classification of Headache (2003). Visual Analog Scale (VAS), Headache Impact Test (HIT-6), and the Hospital Anxiety and Depression Scale (HADS) were used. The arithmetic mean, standard error, Student's t-test, Pearson correlation criterion were calculated. The level of statistical probability was considered to be  $p < 0.05$ .

**Results:** Headache was observed in more than 60% of medical students: 1st year - 68%, IV - 84%, VI - 66% ( $p > 0.05$ ). Among all the courses surveyed, the precedence took tension headache (I course - 30%, IV - 40%, VI - 34%), and the least were students with migraine (18%, 14% and 10%). On the VAS scale, the average score for the 1st year was  $3.92 \pm 1.2$ , IV -  $4.34 \pm 1.32$  and VI -  $3.22 \pm 1.1$ , and on the HIT-6 scale -  $52.1 \pm 8.17$ ,  $54.44 \pm 7.34$  and  $50.28 \pm 7.75$ , respectively. Anxiety disorders took prevalence in all courses compared to depression (mean HADS anxiety score in the 1st year was within  $7.96 \pm 2.6$  points, IV -  $6.36 \pm 1.6$ , and VI -  $5.36 \pm 1.7$  and depression  $5.56 \pm 1.9$ ,  $4.42 \pm 1.8$  and  $4.56 \pm 1.2$ , respectively,  $p > 0.05$ ). A direct correlation was found between a significant level of anxiety symptoms and a high VAS score ( $r = 0.353$ ) and HIT-6 ( $r = 0.42$ ),  $p < 0.05$ . The increase in depressive manifestations was accompanied by an increase in the number of students with headache ( $r = 0.369$ ) and a worse HIT-6 score ( $r = 0.412$ ),  $p < 0.05$ .

**Conclusions:** Students of all years suffer from headache with great preference for tension headaches. High levels of anxiety and depressive states due to HADS combine with an increased impact of headache on daily activities, and greater percent of people with headache directly correlates with an increase in the level of depression, however, the intensity of headache due to VAS depends on the level of anxiety ( $p < 0.05$ ).

**Keywords:** headache, anxiety, HADS, VAS, depressive conditions.

## **MUNCHAUSEN BY PROXY SYNDROME IN MOVIES AND TV SERIES**

Marcin Kuna

**Scientific supervisor:** Maja Herman, MD

Student Psychiatry Club of prof. Jan Mazurkiewicz, Department of Psychiatry, Faculty of Medicine, Medical University of Warsaw, Poland

**Introduction:** Munchausen by proxy syndrome is a better-known name of DSM-5 Factitious disorder imposed on another (FDIA). It is a psychiatric condition where a caregiver, most likely being the mother, is declaring non-existent symptoms in their children, manufacturing the medical history and impacting upon examination and laboratory results. There is no apparent benefit coming from medical abuse other than gaining affection. Medical students and doctors are taught to trust and help their patients and families; hence it may be difficult to make an appropriate diagnosis. When suspicion emerges, it is confronted with possible legal claims on overlooking an actual illness. It is crucial to know how can FDIA manifest itself in order to prevent unnecessary child suffering. Since it is rarely diagnosed, it may be useful to analyse how is the disorder depicted on the silver screen.

**Methods:** Materials for this research study were obtained by analysing available scientific literature as well as popular TV series and cinematographic works.

**Results:** Munchausen by proxy disorder is latterly a buzz topic, because of a story of Gypsy Blanchard, who was sentenced to 10 years in prison for assisting in the murder of her mother, after life of being made to pass as disabled and chronically ill, subjected to unnecessary surgery and medication, controlled by means of physical and psychological abuse. The story was reported in media and introduced to a wide audience thanks to a recent Emmy awarded The Act, HBO documentary Mommy Dead and Dearest, Gypsy's Revenge and Love You to Death. FDIA has also been depicted in classic movie The Sixth Sense, where one of the dead people the main character sees is young girl, who directs him to a videotape, unveiling the fact that her mother had been feeding her a cleaning agent. The topic is also raised in A Child's Cry for Help, Bubble Boy, Fragile, Loverboy, It and Everything, Everything

**Conclusions:** Owing to Munchausen syndrome being rarely reported diagnosis, its artistic vision may remind health care providers not to blindly trust those we treat.

**Keywords:** Munchausen by proxy, Factitious disorder imposed on another, TV series and movies depiction of psychiatric disorders.

## **EFFECTIVENESS COMPARISON OF THE PSYCHOSOCIAL REHABILITATION BETWEEN HOSPITALIZED PATIENTS AND OUTPATIENTS**

Kotryna Liberyte

**Scientific supervisor:** Dr. Marius Karnickas

Department of University and Psychosocial Rehabilitation, Republican Vilnius Psychiatric Hospital, Faculty of Medicine, Vilnius University, Lithuania

**Introduction:** Psychosocial rehabilitation (PSR) is a recovery model of mental illness, it is a process of making people hopeful, empowered, skilled and supported. This research is focused on finding the difference of the effectiveness of the PSR among the outpatients and hospitalized patients.

**Methods:** A prospective study was conducted; 75 hospitalized patients and outpatients were interviewed before and after programme of PSR. The Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM) was used. The domains are subjective well-being, symptoms, functioning and risk. The sum of all statements in CORE-OM score reflects the overall level of psychological distress. The data were systematized and statistical analysis performed using SPSS 23.0 statistical package. Significance level -  $p < 0,05$ .

**Results:** A paired-samples t-test was conducted to compare CORE-OM scores among patients before the programme of PSR and at the end of it. 47 outpatients completed the questionnaire: 19 women and 28 men, average age of  $36,8 \pm 11$  years and 28 hospitalized patients: 19 women and 9 men, average age of  $49,7,8 \pm 16,5$  years. The most common diagnoses in both groups - schizophrenia, schizotypal and delusional disorders (76,6% outpatients and 53,6% hospitalized patients), followed by affective disorders (23,4% outpatients and 32,1% hospitalized patients). A significant score differences before the treatment of outpatients ( $60,93 \pm 19,51$  points) and after ( $47,23 \pm 21$  points),  $p < 0,05$  as well as before the treatment of hospitalized patients ( $42,86 \pm 22,14$  points) and at the end of it ( $27,82 \pm 16,99$  points) were established. The difference between the score changes before and after the programme of these two groups is not statistically significant ( $p < 0,05$ ). In both outpatient and hospitalized patient groups all four domains decreased statistically significantly after the treatment. In the outpatient group the change of the domain of well-being was the most significant meanwhile in the group of hospitalized patients the biggest change was seen in the domain of symptoms.

**Conclusions:** The level of distress is statistically significantly lower in both PSR outpatient and hospitalized patient groups. The effectiveness of the treatment among these groups is not statistically significant.

**Keywords:** psychosocial rehabilitation, CORE-OM, psychological distress level.

## **PREVALENCE OF PSYCHOSOMATIC SYMPTOMS AMONG PATIENTS OF PSYCHOTHERAPY STATION**

Kotryna Liberyte, Dovile Meidute

**Scientific supervisor:** Dr. Inga Kisieliene, Dr. Ingrida Kazlauskaite

Department of University and Psychotherapy, Vilnius City Mental Health Center, Faculty of Medicine, Vilnius University, Lithuania

**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. This research is focused on finding the prevalence of physical symptoms among the patients who have recently started psychotherapy treatment because of their mental health issues (mostly anxiety and depression).

**Methods:** A prospective study was conducted, 57 patients and 79 people of the control group were interviewed. The questionnaire of 26 questions about psychosomatic symptoms of skin, digestive tract and musculoskeletal system as well as dermatology life quality index questionnaire were used. Statistical analysis performed using SPSS 23.0. A paired-samples t-test was conducted to compare the results. Significance level -  $p < 0,05$ .

**Results:** 25 (42,12%) men and 32 (56,14%) women of the patient group (average age of  $31,9 \pm 9,73$ ); 21 (26,58%) men and 58 (73,42%) women of the control group (average age of  $30,34 \pm 12,21$ ) 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 the control group had symptoms of itching/burning sensation of the skin; hair pulling; joint pain; stomach pain; bitter taste; feeling of bloating; painful swallowing; nausea; diarrhea; back, neck pain; numb feeling in legs and tension in muscles of the back and limbs ( $p < 0,05$ ). During the last 12 months significantly higher number of people in the patient group than in the control group were constantly feeling symptoms of acne; hair loss; changed shape of nails; hoarseness and feeling of being uncomfortably full ( $p < 0,05$ ). Dermatology life quality index (DLQI): the score of 6-10 points reached 14,29% of patients and 1,96% of the control group.

**Conclusions:** In the group of patients with mental health issues physical symptoms of skin, digestive tract and musculoskeletal system were expressed significantly more often than in the control group. Therefore, it is true to say that physical symptoms have strong correlation with mental health, stress and emotions and that special attention to the psychological issues should be paid while diagnosing patients in the primary-care.

**Keywords:** psychosomatic symptoms, psychotherapy, digestive tract, skin, pain.

## USE OF TRANSCRANIAL MAGNETIC STIMULATION IN A CASE OF SCHIZOPHRENIA WITH AUDITORY HALLUCINATIONS

Kotryna Liberyte

**Scientific supervisor:** Dr. Marius Karnickas

Department of University and Psychosocial Rehabilitation, Republican Vilnius Psychiatric Hospital, Faculty of Medicine, Vilnius University, Lithuania

**Background:** Transcranial magnetic stimulation (TMS) provides an ability to modulate specific brain areas. The most common indication for this treatment is depression, however it is also found to be useful for obsessive compulsive disorder, substance abuse and schizophrenia. We present a clinical case of a patient who is diagnosed with schizophrenia and has achieved remission of the auditory hallucinations after treatment with TMS.

**Case Report:** A patient is 19-year-old woman. She was born prematurely at 34 weeks after the physical trauma of her mother. Apgar score 6. At the early childhood the patient was lacking of concentration and was struggling to get in contact with other children. Since 10-year-old the patient was experiencing auditory, visual and tactile hallucinations. At the age of 14 was diagnosed with anorexia nervosa. She was hospitalized in psychiatric hospital multiple times due to mood swings, suicidal thoughts and actions, intensified auditory hallucinations. The woman is constantly hearing humiliating, insulting voices which are telling her to commit a suicide. The patient received treatment of various antipsychotic drugs, mood stabilizers and antidepressants with no significant effect. On 2015 after being hospitalized in psychiatric hospital and receiving electroconvulsive therapy a few months of the remission period was achieved, however the patient is refusing to get ECT, because after the procedure was feeling sick. For the past 2 years the woman is taking clozapine 300-350mg/d, haloperidol 12,5-15mg/d, agomelatine 12,5mg/d and clonazepam 2mg/d. Due to the medicament resistant constant auditory pseudohallucinoses the patient decided to be hospitalized in Republican Vilnius Psychiatric Hospital and get the treatment of repeated transcranial magnetic stimulation. After performing electroencephalogram and finding no signs of epileptiform patterns 17 procedures of TMS on the left temporoparietal junction were performed. The patient got in to remission period even with a lower amount of medications being used. Both positive and negative symptoms as well as general psychopathological state of the patient got significantly better and the patient did not have auditory hallucinations anymore.

**Conclusions:** The patient who was constantly experiencing auditory hallucinations got in to the remission after course of repeated transcranial magnetic stimulation.

**Keywords:** transcranial magnetic stimulation, auditory hallucinations.



## **STUDY OF AWARENESS OF DANGERS ASSOCIATED WITH USING E-CIGARRETTES AMONG SOCIETY**

Marcin Zaniuk, Magdalena Zawisłak, Patrycja Gierszon, Kaja Karakuła, Tomasz Krysa

**Scientific supervisor:** Dr. n. o zdr. Joanna Milanowska

Department of Applied Psychology, Medical University of Lublin, Poland

**Introduction:** Introduced as new way to quit smoking, e-cigarretes are becoming a new substitute to traditional cigarettes. For quite a long time e-cigarettes were considered a harmless alternative to smoking. However nowadays, each year is bringing new light on side effects of using e-cigarettes. This year, in USA, using e-cigarettes, also known as vaping has probably contributed to several cases of death among users. This resulted in some new laws which were passed to regulate this industry.

**Methods:** As a method we used an original questionnaire, provided on 281 people aged 16 – 25, which results were statistically analyzed. We also analyzed science articles associated to the topic.

**Results:** 71,4 % of responders admitted that they had contact with cigarets in the past. Moreover, 81,6%, says that they are now using or they used e-cigarettess in the past. Only 4,9% of responders think that vaping is harmless. Majority of them (76%) think it is not as harmful as traditional cigarettes. Rest of responders think that e-cigarettes are as harmful as cigarettes. The main reasons for trying e-cigs are: various flavors of liquids (58,4%), desire to try something new (52,8%) and desire to relief stress. Quitting smoking motivated 24,2% of responders.

**Conclusions:** Results show that there is a group of people, who didn't smoke cigarettes in the past, but they are vaping now. Study also shows that people see e-cigarettes as less harmful or even harmless alternative to smoking. Interesting finding is that the percentage of people who started using e-cig to quit smoking is quite small. E-cig are overtaking cigarettes in popularity due to more variety of flavors.

**Keywords:** cigarretes, danger, e-cig, awareness.

## COMMUNICATION WITH SPEECHLESS PATIENT – CHALLENGE FOR MODERN MEDICINE

Magdalena Zawiślak, Marcin Zaniuk, Patrycja Gierszon, Kaja Karakuła, Tomasz Krysa

**Scientific supervisor:** Dr. n. o zdr. Joanna Milanowska

Department of Applied Psychology, Medical University of Lublin, Poland

**Introduction:** Communication between patient and medical team is crucial not only for diagnosis, but also for therapy. Unfortunately, not all patients can verbally communicate with hospital workers. There is a group of patients, that have lost the ability to speech for many various reasons. They cannot express their feelings, emotions, needs or even their pain. Finding the way to communicate with them may improve the therapy results.

**Methods:** The method of the study is analysis of the literature according to the subject of communicating with speechless patients.

**Results:** Study “Exploring the scope of communication content of mechanically ventilated patients” shows that patients that have lost the ability to speak feel frustrated. Authors of the study emphasize the role of choosing proper method of communicating to every single patient to let them express not only basic needs, but also emotional and psychological issues.

Mechanically ventilated patients can use communication tool based on a tablet with a software which lets them communicate with medical workers also using those devices. Study “Use of Communication Tools for Mechanically Ventilated Patients in the Intensive Care Unit” shows that it could be really helpful and have a lot of positive effects on patients comfort. Moreover, it could reduce patients frustration and anger. The results of the study „Effectiveness of a technology-based communication intervention for suddenly speechless patients in critical care units: Nurses perceptions and experiences” has showed that using a TEC (technology-enhanced communication) device may result in saving time during working with patients and increase their comfort. Nowadays there is a lot of researches on using a BCI (brain-computer devices), what is an evidence of a huge role of communication with patient during the therapy. BCI devices are supposed to convert an EEG signal to voice or algorithms used to control machines helping patients in everyday life.

**Conclusions:** Results of the studies shows, that finding the way to communicate with speechless patients could have a strong positive effect on patients comfort, relieving their frustration and improving quality of their lives by enhancing the therapeutic process.

**Keywords:** communication, speechless, patient, bci.

# **Public Health and Reproductive Health**

## COMPREHENSIVE GERIATRIC ASSESSMENT IN PRIMARY CARE – DOES IT WORK?

Anna Średniawa, Anna Krotos, Joanna Mierzwa, Anna Wróbel, Dominika Drwila

**Scientific supervisor:** Dr hab. n. med. Tomasz Tomasik

Department of Family Medicine, Jagiellonian University Medical College, Poland

**Introduction:** Comprehensive Geriatric Assessment (CGA) is a complex diagnostic tool allowing physicians to evaluate patients in older age in medical, psychological, social and functional areas. In our study we wanted to assess the prevalence and severity of frequent problems in elderly like: depressiveness, cognitive impairment, malnutrition, sleep disorders, gait, frailty and functional limitations in basic and complex activities in everyday life.

**Methods:** A cross-sectional questionnaire study was conducted in the periods from April 2018 to April 2019 among patients aged 65 years old and more. Participants were selected from general practitioners' (GPs) offices in Cracow and nearby towns. To perform CGA eight scales were used: the Activities of Daily Living (ADL), the Instrumental Activities of Daily Living (IADL), Mini-Mental State Examination (MMSE), Geriatrics Depression Scale (GDS), Timed Up and Go Test (TT), Mini Nutritional Assessment (MNA), Clinical Frailty Scale (CFS) and Athens Insomnia Scale (AIS).

**Results:** 438 patients (276 women, 162 men) aged from 65 to 96 years old were examined. In most cases participants got high scores in assessed dimensions. Especially, elderly had no problems with activities of daily living (94%). They scored on average 21.6±4.0 points in IADL test. The most common disorders among elderly were insomnia, chronic pain and lowered mood. The older patients were, the more incorrect results in particular tests they had. Results from almost every test used in CGA were correlated with each other ( $p < 0.05$ ).

**Conclusions:** Our study showed that the most widespread problems in GPs' geriatric population were sleep disorders and depressiveness. Due to that fact, GPs should actively ask about those disfunctions during visits. Patients from younger age group (65-74 years) had relatively high scores in CGA tests, so it might be more important to screen people who are older than 75 years. CGA is a good tool when physicians want to identify previously undiagnosed health problems of elderly, but it should be used carefully to avoid over-treatment.

**Keywords:** comprehensive geriatric assessment, general practitioner, screening.

## FEW WORDS ABOUT QUALITY OF LIFE IN ELDERLY PATIENTS IN GENERAL PRACTITIONERS' OFFICES

Anna Średniawa, Dominika Drwiła, Eliza Siemaszko, Anna Wróbel, Anna Krotos

**Scientific supervisor:** Dr hab. n. med. Tomasz Tomasik

Department of Family Medicine, Jagiellonian University Medical College, Poland

**Introduction:** Aging of society is a phenomenon that presents considerable challenge in medicine. Increased life expectancy is a positive trend, but general practitioners (GPs) should be prepared to take care of geriatric patients. One of the tools used to assess elderly patients is comprehensive geriatric assessment (CGA). Nowadays, also quality of life (QoL) is of great importance. The main aim of our study was to evaluate the QoL of seniors in GPs' offices and to correlate it with various social and medical factors and the results of CGA.

**Methods:** A cross-sectional questionnaire study was performed among patients aged 65 years old and above in outpatient clinics in Cracow and vicinity from April 2018 to April 2019. Researchers used EQ-5D-5L questionnaire, which evaluates general QoL on VAS scale and in five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. CGA consisted of eight tests: the Activities of Daily Living (ADL), the Instrumental Activities of Daily Living (IADL), Mini-Mental State Examination (MMSE), Geriatrics Depression Scale (GDS), Timed Up and Go Test (TT), Mini Nutritional Assessment (MNA), Clinical Frailty Scale (CFS) and Athens Insomnia Scale (AIS).

**Results:** We examined 438 patients, out of which 63% were females and 37% males. The average score in EQ-5D-5L questionnaire was 62.36±18.98 points. 2/3 of patients complained about chronic pain or discomfort. Every second patient had problems with walking. Only 21% of patients reached the highest scores in all five dimensions. QoL was correlated with age ( $p<0.001$ ), physical activity ( $p<0.001$ ) and the presence of someone else at home ( $p=0.01$ ). Statistically significant correlations were found between every aspect assessed in CGA and QoL ( $p<0.001$ ) and the strongest relationship was observed in depressive disorders ( $r=-0.57$ ).

**Conclusions:** Elderly patients in GPs' practices had relatively high health-related QoL, which decreased with age, poorer level of education and in people living alone. The most common were problems with chronic pain and discomfort, so we believe that GPs should treat pain more aggressively. In depressed people QoL is much lower than in healthy population, so physicians should earlier recognize mood disorders.

**Keywords:** comprehensive geriatric assessment, quality of life, EQ-5D-5L.

## **EATING DISORDERS IN UNIVERSITY STUDENTS IN ŁÓDŹ, POLAND IN SOCIAL TERMS. ROLE OF THE FAMILY PHYSICIAN**

Maria Dobielska, Praveen Malik, Małgorzata Koziarska-Rościszewska, Marzena Ocetek, Adam Jóźwik

**Scientific supervisor:** Małgorzata Koziarska - Rościszewska

Students Scientific Association of Family Medicine, Medical University of Łódź, Poland; Nephrology, Hypertension and Family Medicine Department, Medical University of Łódź, Poland; Faculty of Physics and Applied Informatics, University of Łódź, Poland

**Introduction:** Eating disorders [ED] such as anorexia nervosa and bulimia nervosa are serious mental and behavioral disorders with a complex etiologies, many including a family basis. These conditions may lead to social withdrawal, anxiety, depression or addiction.

**Methods:** A survey-based examination was performed on university students aged 18-26. The anonymous questionnaire concerned studies, attitude to ED, preferred therapy, and any previous diagnosis of ED or trigger factors including family relations. The data collected in the questionnaire and measurement data were statistically analyzed using STATISTICA 9.0.

**Results:** We received a total of 651 responses (Female = 453, Male = 198, Experienced ED directly [EEDD] = 358) The research revealed that 9,5% (43) of the women and 2,5% (5) of the men were diagnosed with ED. ( $p=0,003$ ) Men, more often than women, would seek help from a family physician if they suffered from ED ( $p=0.0389$ ). EEDD students and students diagnosed with ED indicated an unhealthy parent-child relationship as a risk factor more often ( $p=0,0003$ ). EEDD students less often consider family physicians as appropriate specialists to treat ED in comparison to students who have not experienced/not experiencing eating disorders directly. ( $p=0,0184$ ).

**Conclusions:** Eating disorders prove to be a common problem among university students. Unhealthy parent-child relationships are major predisposing factors. Because of the probable family-based onset of the disease, family physicians represent large untapped potential in the effort to diagnose and treat eating disorders.

**Keywords:** eating disorders, students, family physician, general practitioner, family medicine, public health.

## **SEROPREVALENCE OF IGG ANTIBODIES AGAINST MEASLES IN SELECTED POLISH POPULATION – SHOULD WE BE RE-VACCINATED?**

Justyna Holka, Katarzyna Pawlak, Olga Ciepiela

**Scientific supervisor:** Olga Ciepiela, PhD

1Students Scientific Group of Laboratory Medicine, Medical University of Warsaw, Poland;

2Central Laboratory, Central Teaching Hospital of University Clinical Center, Warsaw, Poland;

3Department of Laboratory Diagnostics, Medical University of Warsaw, Poland

**Introduction:** Measles is a highly contagious, preventable, viral disease. Its outbreaks appear all over the world, and decreasing herd immunity forecloses its elimination. High level of IgG antibodies against virus efficiently protects against infection. The aim of this study was to assess seroprevalence of anti-measles IgG in serum of patients at different age tested for measles IgG at our Laboratory.

**Methods:** Total number of 364 samples from patients aged 0-101 age was analyzed using indirect chemiluminescence immunoassay on the Diasorin Liaison® automated analyzer.

**Results:** Our results indicate that seropositivity ratio was 78.02%. The lowest number of seropositive subject was shown in the group of infants (0-1 years old) – 53.85%, and group of adults aged 19-38 years old – 55.68%. The highest ratio of seropositive subject was found in a group of the oldest patients (70-101 years old) - 100%, and adults aged 60-69 years old – 97.22%.

**Conclusions:** These data suggest that group of young adults who were vaccinated with one or two doses of MMR vaccine in childhood are the most susceptible for infection, and when working in contact with other people, should be re-vaccinated to be protected against measles.

**Keywords:** anti-measles IgG, antibodies, herd immunity, humoral immunity, measles, seroepidemiology.

## **HOW MANY CIGARETTES A INHABITANT OF THE LUBELSKIE VOIVODESHIP SMOKES PER DAY (2015-2018)**

Robert Chudzik, Marcin Kulczyński

**Scientific supervisor:** Paweł Rybojad MD PhD Habilitated, Marek Sawicki MD PhD Habilitated  
Chair and Department of Thoracic Surgery, Medical University of Lublin, Poland; Chair and Department of Neurology, Medical University of Lublin, Poland

**Introduction:** According to WHO, clean air is considered as one of the basic criterium influencing human health. Using the formula developed by Dutch researchers for calculating the number of passively smoked cigarettes, we can calculate how many cigarettes each inhabitants of the Lubelskie voivodeship passively smokes per day. The calculations are based on the concentrations of two of the mains pollutants: PM 2.5 and NO<sub>2</sub>. Their main source is the burning of fossil fuels and road transport. The aim of the study was to calculate number of passively smoked cigarettes among Lubelskie voivodeship population.

**Methods:** We used Microsoft Excel to analyze databases of the Chief Inspectorate for Environmental Protection (2015-2018). Calculation was made by formula prepared by Saskia C. van der Zee, Paul H. Fischer, Gerard Hoek 2016.

**Results:** PM<sub>2,5</sub> annual mean µg/m<sup>3</sup>: 2015-24,7; 2016- 22,2; 2017-23,4 ; 2018-22 NO<sub>2</sub> annual mean µg/m<sup>3</sup>: 2015-14,5; 2016-13,6 ; 2017-13,2 ; 2018-14,1 Number of passively smoked cigarettes per day: 2015- 8,6; 2016- 7,8; 2017-8,1; 2018-7,8

**Conclusions:** After analyzing the calculations, we can determine that each inhabitant of the Lublskie voivodeship passively smokes almost half a packet of cigarettes a day. This gives half a packet for year, after 60 years we already have 30 packets/years. This is the limit after which risk of developing lung cancer increased. Most of cases occur just after the age of 60. We can therefore assume that air pollution increases morbidity of lung cancer. This is valuable information, especially for patients who have never smoked cigarettes.

**Keywords:** smoke, lung caner, air pollution.



## **AWARENESS OF TATTOO ARTISTS ABOUT THE RISKS OF TRANSMISSION OF INFECTIONS THROUGH HANDS IN TATTOO STUDIOS IN UKRAINE.**

Kateryna Orlovska, Arkadii Orlovskiyi

**Scientific supervisor:** -

Department of Epidemiology, National Medical University, Kharkiv, Ukraine

**Introduction:** Tattoo (drawing on the skin) is an invasive procedure, with large-scale damage to the integrity of the skin and the introduction of pigments into the dermis. One of the most important rules for preventing the transmission of infections, especially parenteral (blood) infections, is strict adherence to rules for hand treatment and personal hygiene by staff. Since the tattoo procedure involves direct contact between the hands of the tattoo artist and the skin of the client, there is a significant risk of contracting infections through the hands.

**Methods:** A questionnaire of 40 questions was developed regarding the attitude and practice of hand processing among tattoo artists. The questionnaire consists of 3 parts: passport, knowledge (infectious risks in the work of a tattoo master, security), practice (what knowledge is used in practice). A total of 542 respondents took part in the survey. The survey was conducted in June-August 2019. Respondents personally answered questions.

**Results:** Of the 542 tattoo artists surveyed, the majority were men - 69%, women 31%. By age groups: 222 people (41%) 18-25 years old; 152 people (28%) 26 - 35 years old; 130 people (24%) 35 - 45 years old; 38 people (7%) - 45 years +. Most respondents 393 people (72.5%) have been working as tattoo artists for less than 3 years, 142 people (26.2%) have been working for 5-10 years, 7 people (1.3%) have been working more than 15 years. 21 people (3.9%) have medical education, 13 people (2%) underwent medical training, 508 people (94.1%) do not have any medical training. 504 of the interviewed masters (93%) observe the rules of personal hygiene (by washing with soap and water) after visiting the toilet, 228 masters (42%) after coming from the street to the workplace. None of the respondents treat their hands with alcohol-containing solutions, before putting on gloves, 21% respondents wash their hands with soap and water, 79% respondents do not handle their hands. 80% of respondents before starting work, treated gloves with alcohol-containing solutions., 20% of the masters after a tattoo session wash their hands. Hygiene treatment of the hands in full is not carried out by any of the tattoo artists interviewed. At the time of the survey, 493 tattoo artists (91%) noted that they had damage to the integrity of the skin of the hands. Of the 542 respondents, 214 people (39.5%) said they did not know what infections could be transmitted by hand.

**Conclusions:** The questionnaire data indicate that the masters do not possess the knowledge and skill of hygienic processing of hands. They do not have knowledge about hand-borne infections. Since the tattoo is associated with a violation of the integrity of the skin and can be equated with medical manipulations, we believe it is necessary to develop and introduce educational programs on the hygienic treatment of hands in the activities of tattoo artists, as well as introduce regulatory documents for tattoo studios in Ukraine.

**Keywords:** hand hygiene, hands-transmitted infections, tattoos, tattoo master.

## **BMI, WC OR WHtR? THE BEST PREDICTOR OF BIOCHEMICAL ABNORMALITIES**

Marcin Czezelewski, Paweł Kędzierawski, Cezary Sienko, Wiktor Borkowski-Wrona, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** The amount of body fat to a great extent determines the cardio-metabolic risk factors such as elevated blood glucose levels and dyslipidemia. However, direct measurement of body fat requires advanced methods like a magnetic resonance or bioelectrical impedance analysis. Hence, to reduce financial and time expenditure the surrogate obesity indicators are used in clinical practice. Well known indexes are Body Mass Index (BMI) and waist circumference (WC), yet, there is ongoing research for a more specific one. Waist-to-height ratio (WHtR) is proposed as a height-specific indicator of central obesity. The aim of the study was a comparison of surrogate obesity indicators in estimating the biochemical abnormalities.

**Methods:** The retrospective cross-sectional analysis included 2333 people (1276 women and 1057 men). Measurement of somatic features included body mass, body height, and waist circumference. Additionally, the biochemical analyzer Hitachi from fasting blood samples determined: total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), triglyceride (TG), fasting plasma glucose (FPG). Data were analyzed using Receiver Operating Characteristic and Pearson's correlation coefficient.

**Results:** Analysis of the relationships between surrogate body fat indexes and lipid parameters showed inverse correlation ( $p \leq 0,05$ ) between TC and BMI, WC, yet, lack of the relationship between TC and WHtR. Inverse correlations ( $p \leq 0,001$ ) were observed between HDL-C all indexes. However, LDL-C did not have a significant relationship with any of the surrogate indexes. The concentration of TG and glucose was highly significantly ( $p \leq 0,001$ ) correlated with VAI, BMI, WHtR and WC. Computed values of AUC indicated weak ( $AUC < 0,7$ ) ability of indexes to predict deviations from the norm. Significant ability was presented by WC in predicting HDL-C and TG; BMI and WHtR in predicting HDL-C, TG, and FPG.

**Conclusions:** Our results indicate higher importance of measuring waist circumference over other examined anthropometric indicators in the studied population. In clinical practice, the simplicity of use of this indicator combined with high efficiency in the detection of metabolic and cardiovascular risk factors constitute a unique combination. Other indicators can also be useful in assessing deviations in lipid and carbohydrate metabolism.

**Keywords:** obesity, waist circumference, body mass index, waist-to-height ratio.

## KNOWLEDGE, AWARENESS AND PRACTICE OF IRON-DEFICIENCY ANEMIA AMONG THE POPULATION OF UKRAINE

Serhii Iliukha, Tetyana Chumachenko

**Scientific supervisor:** -

Department of Epidemiology, Kharkiv National Medical University, Ukraine

**Introduction:** World Health Organization estimated about 30% of population has iron-deficiency (ID). ID negatively affects the physical and cognitive development of children, damages the immune mechanisms, leads to a condition of anemia and an increase in the incidence of infectious diseases. Among the influences that cause ID, nutritional factors (inadequate iron intake due to poor or restrictive diets, foods that reduce iron absorption etc.) are significant and preventable. Our aim was to estimate the level of knowledge, attitude and practice (KAP) of Ukrainian population in iron-deficiency.

**Methods:** Cross-sectional study was conducted in March-June in 2019 in Western and Eastern Ukraine. Self-administrated questionnaires consisted of 4 parts: demographic information, assessment of knowledge, attitude and practice were used. Questionnaire included “yes” or “no” and multiple-choice questions. There were a total 629 study participants, where gender distribution was 215 of male and 414 of female. Respondents were divided into two groups according to their age: 1st group 6-18 years old scholars, and 2nd group 26-69 adults (parents and grandparents). These groups also were divided into subgroups: rural and urban residence. For analysis we used DB Browser (SQLite) and Microsoft Office Excel.

**Results:** The obtained data revealed a high level of knowledge about ID and anemia in 2nd group in both rural (80% adult participants) and urban (87% adult participants) residence. But 1st group was significantly less aware in this condition - 34% respondents in both areas. We observed a good level of knowledge about food with high consistent of iron in both groups: 86% respondents and 89% respondents in rural and urban areas respectively in the 1st group, 66% respondents and 72% respondents in rural and urban areas respectively in 2nd group. One of the risk factors of ID is drinking beverages which impair iron absorption. In the group 1 we observed high level of those who drank coffee/tea - 92% school-age children (73% of them practiced it every day) and 94% school-age children (81% of them practiced it every day) in rural and urban area respectively. Group 2 answered that the 97% of surveyed drank coffee or/and tea and 97% of those who drank this beverages every day in both rural and urban area. When assessed for anemia risk expose we found that 352 responders refrained from answering the question about their own possible risk of anemia, so the total number of responders of 277 was taken for this indicator, where 45% of them said they could not have an anemia, 50% of them were not sure, and 5% of responders thought that they may have an anemia.

**Conclusions:** In our study we noted that adults had a higher level of knowledge comparing to younger responders. Schoolchildren, especially adolescents, have an increasing consumption of food outside the home, including fast food. On the other hand there are a lot of female among of responders which are under a higher risk of anemia comparing male due to physiological peculiarities. Also, the high levels of consumption coffee/tea in both groups give rise to concern. Taking account of higher level of physical activity and physiological peculiarities, the group of scholars is vulnerable to such condition as ID. Thereby it is important to implement sufficient preventative measures such as good nutrition and educational programs in schools.

**Keywords:** nutrition, vitamins, minerals, diet, school-aged children.

## THE KNOWLEDGE AND EXPERIENCES OF PREGNANT WOMEN REGARDING PHYSICAL ACTIVITY DURING PREGNANCY

Izabela Walasik, Katarzyna Kwiatkowska

**Scientific supervisor:** MD, PhD, Katarzyna Kosińska-Kaczyńska

1st Department of Obstetrics and Gynecology, Medical University of Warsaw, Poland

**Introduction:** Adequate physical activity of a pregnant woman has been proven to decrease the risk of pregnancy complications. The knowledge of women regarding physical exercise in pregnancy is a part of conscious motherhood, while a lack of it may lead to not taking up any form of physical activity during pregnancy.

**Methods:** An anonymous questionnaire, consisting of 57 questions, was completed electronically in 2018 by women who gave birth at least once. The respondents were qualified as “physically active during pregnancy” if they performed physical exercises such as regular walks, marching, jogging, working out at a gym, swimming, yoga, pilates, fitness, exercise-ball workouts or home gymnastics.

**Results:** The study group consisted of 9345 women. 52% of them performed exercises during pregnancy. The main reasons for a lack of physical activity were: lack of interest in physical activity (45%), lack of energy (40%), lack of knowledge regarding proper exercise during pregnancy (34%), lack of time (27%) and medical contraindications (25%). Non-active respondents suffered from gestational hypertension (6,7% vs 9,2%;  $p < 0,01$ ) and gave birth prematurely (7% vs 9%;  $p < 0,001$ ) to newborns with a lower birth weight significantly more often (4% vs 6%;  $p < 0,001$ ). Physically active women reported suffering from pregnancy-related ailments such as fatigue, back pain or constipation significantly less often. 22% of all respondents were unable to identify reliable sources of information regarding exercise during pregnancy. A majority of the exercising women used the Internet to obtain gain information on physical activity during pregnancy (69,1%). 4% of women thought that exercising during pregnancy is forbidden, while 20% thought it is not allowed in the 3rd trimester. Physically active women had vaginal delivery more often (61% vs 55%;  $p < 0,05$ ). Episiotomy was performed most often on non-active primiparous respondents (77,5% vs 71% active primiparous,  $p < 0,001$ ). 13% of women felt discriminated due to their physical activity during a pregnancy. 22% of respondents' physical activity was not accepted by their environment. 39,1% of the women were told by others to stop physical exercise because it was bad for the baby's health.

**Conclusions:** The knowledge of Polish women regarding proper physical activity during pregnancy is insufficient, which may influence a lack of will to initiate such activity among pregnant women. Physical activity of a pregnant woman may have an impact on the course of the pregnancy and birth.

**Keywords:** pregnancy physical activity.

## **ANALYSIS OF THE MEDICAL GYNECOLOGICAL CARE**

Kinga Dudek, Dominika Tatar, Weronika Dąbrus, Krzysztof Starszak

**Scientific supervisor:** Dr n. med. Mateusz Zamłyński

Student Research Circle of Gynecology, Obstetrics and Oncological Gynecology at the Department of Gynecology, Faculty of Medicine, SUM Katowice, Medical University of Silesia, Poland

**Introduction:** Regulations concerning care of patients receiving oral hormonal contraception are specified in the Recommendation of the Polish Gynecological Society regarding indications and safety the use of hormonal and intrauterine contraception from March 2014. Putting the guidelines into practice in the context of holistic gynecological care was examined.

**Methods:** The study involved 2,881 women who declare to use oral hormonal contraception, in the age 16 to 35 years. The questionnaire prepared by our team contained 29 questions - single and multiple choice, and open questions with short answers.

**Results:** Less than 10% of women admitted that the gynecologist didn't order biochemical tests before the implementation of oral contraceptive, while most had the physical examination. It is worth noting that 1800 (62.5%) respondents intending to use oral contraceptive, didn't have basic blood tests ordered. Women using oral contraceptive usually arranged control visits between 6 and 12 months.

**Conclusions:** Recommended tests are often not ordered, because the money intended for them, comes from the benefits package (economic considerations). The issue of interpretation of the guidelines by doctors may also be a problem. Actually recommendations were created in 2014 - it's necessary to consider updating them corresponding to the situation in the current year.

**Keywords:** contraception, gynecological care, gynecology examination.

## **PATIENTS MENTAL HEALTH AND THE USE OF ORAL HORMONAL CONTRACEPTION**

Dominika Tatar, Kinga Dudek, Weronika Dąbruś, Krzysztof Starszak

**Scientific supervisor:** Dr n. med. Mateusz Zamłyński

Student Research Circle of Gynecology, Obstetrics and Oncological Gynecology at the Department of Gynecology, Faculty of Medicine, SUM Katowice, Medical University of Silesia, Poland

**Introduction:** Depression is one of the most serious problems of the modern world affecting about 350 million people. According to WHO predictions, in 2030 it may be the first most common disease in the world. When conducting research on population groups of women of different ages taking oral hormonal contraception, the information collected is often analyzed for comorbidities, while the authors observed marginalization of depression. The frequency of adverse events was comparatively analyzed in groups of women declaring the disease, and healthy.

**Methods:** From the respondents, we chose a group of 2614 healthy patients and 267 patients suffering from depression who had previously used oral contraceptive. The study group consisted of women under gynecological care, aged 16 to 35. The questionnaire prepared by our team contained 29 questions - single and multiple choice, and open questions with short answers.

**Results:** It has been observed that mood disorders, as an side effect, are more common in patients with depression, than in women who declare no such disease. The most common complaints also turned out to be the most troublesome for patients from both groups, which was often the basis for changing the preparation by the gynecologist. In the majority of respondents, a preparation change, brought a satisfactory effect - a reduction of symptoms previously complained to by their doctors, however, the occurrence of side effects was more common in the group of patients suffering from depression.

**Conclusions:** It has been observed that the use of oral hormonal contraceptives may adversely affect the patient's mental health. It was noticed that women with diagnosed depression more often deteriorated their mood, compared to women declaring they had no disease. It is important to analyze patient data, also in terms of mental health, which may affect the possibility of choosing better therapy and noticing correlations, necessary to create new algorithms for treating people suffering from mental illness.

**Keywords:** contraception, side effects, depression, mental health.

## USE OF ORAL HORMONAL CONTRACEPTION IN HEALTHY AND DISEASED WOMEN

Dominika Tatar, Kinga Dudek, Weronika Dąbruś, Krzysztof Starszak

**Scientific supervisor:** Dr n. med. Piotr Bodzek

Student Research Circle of Gynecology, Obstetrics and Oncological Gynecology at the Department of Gynecology, Faculty of Medicine, SUM Katowice, Medical University of Silesia, Poland

**Introduction:** Due to the accompanying diseases a large group of women, who declare to use oral hormonal contraception, is under care of many specialist clinics. Anamnesis and physical examination before beginning of therapy and control tests during it, plus classification of adverse reactions are the integral part of the therapeutic process.

**Methods:** The study involved 2,881 women who declare to use oral hormonal contraception, in the age 16 to 35 years. The questionnaire prepared by our team contained 29 questions - single and multiple choice, and open questions with short answers. Four subpopulations were identified because of diseases declared by the respondents.

**Results:** Most patients did not have laboratory tests ordered or performed, both before and during contraception. The exception are women with polycystic ovary syndrome (PCOS). 115 (35.94%) patients with PCOS didn't have laboratory tests ordered, while in the subpopulation with no comorbidities they were not ordered in 1293 (65.73%). For comparison - in patients suffering from obesity - 125 (64.77%), with hypothyroidism - 123 (52.34%). The most commonly used preparation in all patients was the combination of drospirenone 3mg + ethinylestradiol 0.02 mg. The most common side effects were: sex drive decrease, scanty withdrawal bleeding, emotional lability, weight gain, and vaginal dryness.

**Conclusions:** The method of anamnesis and physical examination by the gynecologist, during the first and next visits, is similar in all subpopulations - both for patients who declare other diseases, as well as for those, who are not struggling with any diseases. More often, laboratory tests were order in group of patients with PCOS, compared to other subpopulations. The least frequently measured were D-dimers concentration and genetic tests. Patients with PCOS and hypothyroidism, compared to others, slightly more often complain about emotional lability, which can be caused by the underlying disease or taking medication. As in the case of obese patients, who more often report weight gain.

**Keywords:** contraception, side effects, comorbidities, gynecology.

## **NUTRITIONAL MANAGEMENT IN CHRONIC KIDNEY DISEASE. NEW POSSIBILITIES FOR VITAMIN D.**

Zofia Pietrzak, Anna Kolano, Natalia Baran

**Scientific supervisor:** Dr n.med. Agnieszka M. Grzebalska

Student Research Circle at the Department of Nephrology, Medical University of Lublin, Poland

**Introduction:** Chronic kidney disease (CKD) is a civilization disease. It is estimated that in Poland about 4 million people suffer from CKD. There are many risk factors leading to acceleration of CKD course. Some of them, like diet, can be modified. Especially reduction of protein and sodium intake is recommended in order to delay renal replacement therapy (RRT). Another one common problem in CKD is Ca/P metabolism abnormalities. It can be found in the third stage of CKD and remains for life. Dangerous complications, like calcification in the cardiovascular system or osteodystrophy can emerge as a result of this disorder. Up today there is no possibility to eliminate them.

**Methods:** In this work we have made an analysis of current nutritional recommendations and publications on diet in chronic kidney disease.

**Results:** Many studies have shown disorders in Ca/P homeostasis in patients with CKD, which lead to renal osteodystrophy and cardiovascular complications (valves and coronary arteries calcification). The typical abnormalities for CKD are: hypocalcemia, hyperphosphatemia and secondary hyperparathyroidism, because of reduction in converting vitamin D into its active form. Thus, in order to improve the Ca/P homeostasis, supplementation of calcium and the synthetic derivative of vitamin D (alphadiol) are commonly used. Alphadiol reduces the increased level of PTH and thereby saves bones from osteomalacia. In the last years there were many studies which focus on Vitamin D 3 deficiency and its supplementation in healthy individuals living in the northern countries. The same problem: Vitamin D 3 deficiency, is affecting patients with CKD. It is worth to ask yourself a question, if Vitamin D3(1,25-(OH)2D3), (calcitriol), should be given to patients with CKD or maybe alphadiol is quite enough? Opinions are divided. If you decided to use both: alphadiol and calcitriol, you must carefully monitor the level of Ca and P to avoid hypercalcemia and calcification.

**Conclusions:** Supplementation of vitamin D3 in patients suffering from advanced stages of CKD or under RRT is still a matter of futures, but improvement in Ca/P homeostasis may prevent cardiovascular complications, thus may markedly reduce mortality among patients.

**Keywords:** chronic kidney disease, diet, nutrition, calcium-phosphate metabolism.



## **RISK STATUS ASSESSMENT IN PREGNANT WOMEN IN RURAL AREAS OF BELAGAVI, INDIA**

Bartłomiej Marcinkiewicz, Magdalena Rybaczek

**Scientific supervisor:** Assoc. Prof. Sulakshana Baliga, Łukasz Szczerbiński MD PhD

Department of Endocrinology, Diabetology and Internal Medicine, Medical University of Białystok, Poland;  
Department of Community Medicine, Jawaharlal Nehru Medical College, Belagavi, India

**Introduction:** High-risk pregnancy is defined as one which is complicated by factor or factors that adversely affects the pregnancy outcome (maternal, perinatal or both). Global Health Observatory data shows that Maternal Mortality Ratio for United States of America is 14 per 100 000 live births, in India – 174 per 100 000 live births. In India about 20-30% pregnancies belong to high risk category, which is responsible for 75% of perinatal morbidity and mortality. So timely detection of high risk pregnancies is important. In view of above facts, the present study was planned to assess risk status in rural areas of Belagavi, India.

**Methods:** The cross-sectional study in Primary Health Centre and surrounding subcenters at field practice area of Department of Community Medicine, Jawaharlal Nehru Medical College, Belagavi, India. The data were obtained from group of pregnant women attending prenatal clinics under Primary Health Centre during the study period (1st – 31st August 2018). Data was collected through interviewing the study participants during prenatal investigation by prepared questionnaire, before medical examination.

**Results:** In results from 412 participants, age range of the women 17-41 years. According to the scoring system used, 68.2% of the women had a high risk pregnancy. From total amount of study participants 32,8% were registered after 12 weeks of gestation. Among study group 17,5% women were high risk, due to age of first pregnancy <18 or >30 years. Significant impact on study had anemia, previous mode of delivery, previous obstretic complications and chronic diseases.

**Conclusions:** The prevalence of high risk pregnancy in our study was 68,2% which is very high. In study group anemia was the most common risk factor during pregnancy. Prevalence of high risk pregnancy was found higher in lower socioeconomic status and in lower education group. Low socioeconomic status is a high risk factor, such as more probability occurrence of infection or obstretic complications, due to poor maintenance of hygiene, difficulties with access to healthcare facilities.

**Keywords:** high risk pregnancy, pregnancy, India, Belagavi.

**PHYSICAL EXAMINATION BY NURSES - PROSPECTS AND OBSTACLES**

Marcin Czeczelewski, Paweł Kędzierawski, Karolina Brzozowska, Wiktor Borkowski-Wrona, Jacek Baj

**Scientific supervisor:** Dr n. med. Jacek Baj

Department of Forensic Medicine, Medical University of Lublin, Poland

**Introduction:** For 20 years Polish nurses have been allowed to perform physical examination of patients. In professional practice this skill is used to identify patient's needs, make correct nurse's diagnosis and take appropriate interventions. The aim of the study was to define the scope of examinations performed by nurses and identify the main obstacles hindering the examination.

**Methods:** The study was conducted using an anonymous survey distributed online to participants of specialist course on physical examination. Responses equaled 171. The obtained data were analyzed using chi-square test in form of G-function. P value <0.05 was considered significant.

**Results:** The majority of respondents were women (97,7%). Almost one third of respondents (32,7%) had below 20 years of work experience, 66 nurses (38,6%) had 21-30 years of seniority and over 30 years in work declared 28,7% of nurses. Over the half of nurses (57,9%) declared to perform physical examination in professional practice. Carrying out physical examination was determined neither by length of work experience, nor possession of specialization, nor academic degree. Among the reasons of not performing physical examination, nurses pointed mainly: lack of time caused by other duties (45,8%), lack of time caused by staff shortages (43,7%) and reluctance of doctors (38,0%). The techniques of physical examination used by nurses were: inspection (81,8%), palpitation (59,6%), percussion (6,1%), auscultation (22,2%). Performing percussion and auscultation was significantly more often declared by nurses with specialization ( $G=10,09$ ;  $p<0,01$ ;  $G=6,33$ ;  $p<0,05$ ). Nurses with bachelor or master's degree declared to perform palpitation significantly more often ( $G=15,03$ ;  $p<0,001$ ) than nurses without degree. The body areas/ organs that were the most often examined by the nurses in the professional practice were: skin (78,8%), abdominal cavity (57,5%), oral cavity (55,6%) and thorax (50,5%).

**Conclusions:** Physical examination is a tool that allows nurses to obtain information about a patient. The work experience and education level did not determine whether the examination would be performed. The most often performed type of examination is inspection. The main obstacles in performing the examination were lack of time and doctors' reluctance.

**Keywords:** physical examination, nurses, diagnosis, palpation, auscultation, percussion.

## PRIMARY NON-COMPLIANCE TO RESPIRATORY MEDICINES – CONCLUSIONS FROM E-PRESCRIPTION PILOT IN POLAND

Grzegorz Kardas

**Scientific supervisor:** Michał Panek, Piotr Kuna, Przemysław Kardas

Department of Internal Medicine, Asthma and Allergy, Medical University of Lodz, Poland

**Introduction:** From 01/01/2019, all pharmacies in Poland support electronic prescriptions (e-prescriptions), and from 2020 e-prescriptions are to become a national standard. In 2018, an e-prescription pilot was carried out in Poland, which included both hospital centers and primary healthcare facilities. This created a chance to analyse the primary non-compliance, which is the percentage of patients who do not purchase a prescription, to different drugs. In this work, we focused on respiratory medicines. Our aim was to assess the degree of primary non-compliance with for respiratory medicines (Beta2-adrenergic agonists, inhaled corticosteroids etc.) in Poland, understood as failure to comply with the prescription issued on time.

**Methods:** We used the data from the e-prescription pilot in Poland from 2018 containing 47,163 e-prescriptions for 119,880 drugs. Among these, 1973 e-prescriptions were issued for inhaled respiratory medicines.

**Results:** The overall primary non-compliance for respiratory drugs issued on an e-prescription in 2018 reached 16,97%, while for inhaled respiratory medicines it was 15,31%. In particular, 13,33% inhaled corticoids, 16,82% LABAs, 13,92% LAMAs, 14,64% SABAs were not purchased; no statistically significant differences in this aspect among genders were found. However, statistically significant differences were found among different age groups, where primary non-compliance in particular groups was: 11,8% (1-18 y.o.), 17,8% (19-39 y.o.), 17,5% (40-64 y.o.), 18,0%(65-74 y.o.) and 10,8% (75+ y.o.),  $p=0,0023$ . Also, we found that a higher primary non-compliance was observed for DPI (17%) than for MDI (13,4%) inhalers,  $p=0,0415$ .

**Conclusions:** Inhaled respiratory drugs were purchased by Polish patients slightly above the average for all preparations prescribed in the form of an e-prescription in 2018. Age, but not gender, significantly influenced the degree of primary non-compliance. This is the first analysis for inhaled respiratory drugs using the e-prescription database in Poland, which allows for a reliable assessment of primary non-compliance. However, one should remember about the pilot nature of the e-prescription in 2018, which could have affected the results.

**Keywords:** asthma, allergy, primary non-compliance, e-prescription.

## THE USE OF POSTCOITAL CONTRACEPTION AMONG STUDENTS

Alicja Ozga, Aleksandra Obuchowska, Justyna Wójcik, Karolina Obuchowska, Żaneta Kimber-Trojnar

**Scientific supervisor:** Żaneta Kimber-Trojnar, MD, PhD

Student's Scientific Association at the Chair and Department of Obstetrics and Perinatology, Medical University of Lublin, Poland

**Introduction:** Nowadays there are two methods of postcoital contraception that available in Poland - pills containing ulipristal acetate (UPA) and levonorgestrel (LNG). These pills, if taken in the middle of follicular phase, cause inhibition or delay in ovulation, restraining the follicle growth. These medicines affect endometrium, causing significant tissue changes and thus decreasing the ability of a blastocyst to implant. They also increase the density of cervical mucous and inhibit peristalsis of fallopian tubes. UPA should be used within 120 hours (5 days) of an unprotected sexual intercourse or if method of contraception used has failed. Ulipristal acetate is given in a single dose of 30mg, regardless of the day of menstrual cycle. The typical dosage of levonorgestrel is 1,5mg and it should be used within 72 hours of unprotected sex.

**Methods:** Investigation is based on the results of the survey conducted from November 2018 to January 2019 among students from polish universities. The valid scientific literature regarding postcoital contraception is also presented.

**Results:** 848 students at age from 18 to 28 years old were involved in the survey. 15% of them used postcoital contraception - the most often cause was the failure of other contraceptive method. Scientific researches showed that UPA has a significant advantage over LNG respect to the emergency contraception.

**Conclusions:** Survey displays that emergency contraception seems to be relatively popular among students of universities in Poland.

**Keywords:** ulipristal acetate, levonorgestrel, postcoital contraception, emergency contraception.

# **Radiology and Nuclear Medicine**

## **DIAGNOSIS OF POST-TRAUMATIC CHANGES IN THE SPLEEN**

Ignacy Rożek, Karol Bochyński, Katarzyna Drelich, Agnieszka Brodzisz, Magdalena Woźniak

**Scientific supervisor:** Dr hab. n. med. Magdalena Woźniak

Department of Pediatric Radiology, Medical University of Lublin, Poland

**Introduction:** The abdominal cavity is the second most common area of injury. Post-traumatic changes most often occur in the liver and spleen. Due to its superficial location and fragile structure, the spleen is extremely vulnerable to damage, which can be a great threat to patients' lives.

**Methods:** Ultrasound was performed on 15 patients with abdominal trauma with suspected spleen injury. Eight haemodynamically unstable patients were referred for abdominal CT dynamic examination.

**Results:** Out of 15 patients after abdominal trauma, 5 patients (33%) were diagnosed with interstitial hematomas, 4 patients (27%) with subcapsular hematomas. Two patients (13%) were diagnosed with splenic rupture without rupture of the capsule, while four patients (27%) had fluid in the abdominal cavity and small pelvis and coexistence of interstitial hematoma. Computed tomography confirmed the diagnosis of ultrasound. In addition, 4 patients in the CT scan showed extravasation of the contrast agent indicating active bleeding.

**Conclusions:** Ultrasound examination in children after abdominal trauma is a method with high sensitivity and specificity. Computed tomography makes it possible to confirm these changes and additionally to recognize active bleeding, which are invisible in ultrasound.

**Keywords:** abdominal injuries, ultrasound, splenic changes.

## **BONE METASTASES IN PATIENTS WITH COLORECTAL CANCER DETECTED WITH 18 FDG PET/CT**

Tomasz Szawłoga, Mikołaj Skrzypczak, Paweł Olko, Adrianna Serwin, Sylwia Nemeček

**Scientific supervisor:** Anna Nocuń, MD, PhD

Department of Nuclear Medicine, Medical University of Lublin, Poland

**Introduction:** Positron emission tomography/computed tomography (PET/CT) is a very good referential method of detecting tumors. It is suitable for primary and secondary cancers, with high sensitivity for detection of metastatic lesions in various locations, for example bone metastases undetectable with other modalities. The aim of this retrospective study was to analyse incidence, location and activity of bone metastases in colorectal cancer detected by fludeoxyglucose (18FDG) PET/CT.

**Methods:** The database of the Department of Nuclear Medicine, Medical University in Lublin was analysed for patients with pathologically proven colon and rectal cancer who underwent 18FDG PET/CT and were detected with bone metastases. Images were acquired using PET/CT system Biograph mCT S(64) -4R (Siemens, Germany).

**Results:** A total of 28 (6%) cases among 477 patients with colorectal cancer who underwent PET/CT between January 2015 and March 2019 were diagnosed as having bone metastases (17 male, 11 female, age 34 to 81 years, mean age 63 years, 12 cases with rectal cancer, 16 with colon cancer). 36 bone metastases were found: 21 lesions were sclerotic (58%), 8 lytic (22%) and 7 mixed (20%). The most frequent site was the sacral bone (11 lesions – 30%) followed by the pelvis (10 – 28%), thoracic spine (4- 11%), lumbar spine (4 – 11%), ribs (4 – 11%), long bones (2 – 6%) and the sternum (1 – 3%). In 13 patients bone metastases were associated with local recurrence (47%), followed by hepatic lesions (8 – 28,5%), occasionally lymphatic nodes (4 – 14%), peritoneum (2 – 7%) lungs (1 – 3,5%). Standardized uptake values (SUV) were from 2,6 to 31,2 with mean 7.

**Conclusions:** Bone metastases in patients with colon and rectal cancer are rare, in all cases associated with local recurrence or spread to other organs. The most frequent sites of these lesions are the sacral bone and the pelvis. They are mostly sclerotic, in some cases presenting high metabolic activity.

**Keywords:** PET/CT, colon cancer, rectal cancer, bone metastases.

## **METASTASIS OF COLORECTAL CANCER DETECTED IN PET/CT**

Mikołaj Skrzypczak, Paweł Olko, Adrianna Serwin, Sylwia Nemecek, Angelika Mastalerczyk

**Scientific supervisor:** Dr n.med Anna Nocuń

Department of Nuclear Medicine, Medical University of Lublin, Poland

**Introduction:** PET CT is a very good reference method for detecting cancer. Suitable for detecting primary and secondary changes as well as metastases. Thanks to it, it is possible to detect metastases to typical, often occupied locations, e.g. liver, and to places not detectable by other methods, e.g. bone metastases.

**Methods:** Our database was analysed for patient with pathologically proven colon and rectal cancer who underwent FDG PET/CT in our institution. Images were acquired using PET/CT system Biograph mCT S(64)-4R (Siemens, Germany). CT was performed without contrast enhancement.

**Results:** Among PET examined people in the period from January 2014 to April 2019, 520 patients two-thirds, i.e. 346 had meta-like neoplastic lesions. Age range from 34 to 86 with an average age of 64. The majority of patients were men (220, or 63%), and women constituted 37% (126 people). Most lesions were located in the liver (157), lungs (110), lymph nodes (distinguish) (105), peritoneum (36). Other locations were less frequently used, e.g. pelvis (34), bones (28), muscles (19), sporadically e.g. intestines (10), spleen (7), prostate (7), thyroid (5), adrenal glands (4), kidneys (3), uterus (3), abdominal wall (2). pancreas (1) and perineum (1) In 145 cases (42%) only one location was occupied. Most often it was the liver (50), lungs (24), less often lymph nodes (16), peritoneum (9), occasionally intestines (4), muscles (2), spleen (1) pancreas (1).

**Conclusions:** In the case of colorectal cancer, meta changes occur in various organs, most often to the liver, lungs and lymph nodes. Also in the case of a single lesion, these are the most common metastatic locations

**Keywords:** PET-CT, colorectal cancer, metastasis.



## **SUCCESSFUL EMBOLIZATION OF PULMONARY ARTERY ANEURYSM IN A PATIENT WITH LUNG CANCER: A CASE REPORT.**

Aleksandra Porzucek, Jakub Niziołek, Justyna Żyga

**Scientific supervisor:** Dr hab. n. med. Anna Drelich-Zbroja, lek. Maciej Szmygin

Department of Interventional Radiology and Neuroradiology, Medical University of Lublin, Poland

**Background:** By definition, a true aneurysm is a blood-filled sac resulting from vessel wall dilatation that involves all three layers of vessel wall. Oncological patients, especially undergoing chemoradiation therapy, are more prone to develop vascular malformations, including aneurysms and pseudoaneurysms. However, only a few Pulmonary artery Aneurysm (PAA) cases have been described in patients with lung cancer. Authors present a case of oncological patient with Pulmonary Artery Aneurysm, successfully treated with endovascular methods.

**Case Report:** A 64-year-old female with diagnosis of squamous cell carcinoma of the lung was admitted to the Oncology Department for chemotherapy treatment. On admission the patient complained of weakness and moderate haemoptysis for 2 weeks. Control CT examination revealed disease progression and pathological mass surrounding right pulmonary artery. Due to lab results indicating increasing anemia the patient was referred to Interventional Radiology Department for endovascular treatment. Initial Angiography of right pulmonary artery disclosed a huge aneurysm of the vessel. The urgent procedure of embolization was performed.

**Conclusions:** Pulmonary Artery Aneurysms related to lung cancer are uncommon and potentially life-threatening condition. Mortality rate associated with the rupture of aneurysm ranges from 50% to 100%. Therefore, early diagnosis and treatment is crucial. Interventional procedure of coil embolization is minimally invasive and effective method of treatment.

**Keywords:** pulmonary artery, aneurysm, embolization.

## **THE APPLYING OF CT AND MRI IN THE DIAGNOSIS AND MONITORING OF NEUROBLASTOMA TREATMENT IN CHILDREN.**

Katarzyna Drelich, Karol Bochyński, Ignacy Rożek, Joanna Nurzyńska-Flak, Magdalena Maria Woźniak

**Scientific supervisor:** -

Department of Pediatric Radiology, Medical University of Lublin, Poland

**Introduction:** Neuroblastoma is a malignant tumor of the sympathetic nervous system. It is one of the most common cancers in children and at the same time the most common cancer diagnosed in infants. Its incidence is 5-7% of all childhood cancers. Computed tomography and magnetic resonance imaging play an important role in diagnosing, staging and monitoring of treatment of neuroblastoma in children. The aim of the study is to show the role of CT and MRI examinations in diagnosing and monitoring of treatment of neuroblastoma in children.

**Methods:** In 11 patients aged 0-18 years abdominal and pelvic examinations from 2017-2019 were analyzed. The material included both tumors during diagnosis, monitoring of treatment and after its completion. In total, 123 imaging examinations were performed, 35 of them were CT scans and the remaining 88 were MRI examinations.

**Results:** Both in CT and MR images at the time of diagnosis, the tumor in all patients presented large dimensions (in the largest dimension from 6 to 31 cm). It was a heterogeneous solid tumor showing heterogeneous intense contrast enhancement. In 8 patients tumor calcifications were seen at CT scans at the time of diagnosis. In 7 patients, the tumor crossed the median line, moved adjacent organs and surrounded the vascular structures. In 4 patients, the tumor was also located in the spinal canal in MRI examination.

**Conclusions:** Both CT and MR are non-invasive diagnostic methods. Magnetic resonance imaging allows better assessment of changes in the spinal canal. Computed tomography allows the detection of calcifications in the tumor. There is no clear evidence which of these methods is better because each has its advantages and limitations. Magnetic resonance imaging and computed tomography are complementary methods necessary for diagnosis as well as monitoring of treatment of patients with neuroblastoma.

**Keywords:** neuroblastoma, pediatric radiology, malignant tumor, sympathetic nervous system.

## **EXERCISE-INDUCED INTRARENAL ARTERY RUPTURE. A CASE REPORT**

Jakub Niziołek, Aleksandra Porzucek, Justyna Żyga

**Scientific supervisor:** Dr hab. n. med. Anna Drelich-Zbroja, lek. Maciej Szmygin

Department of Interventional Radiology and Neuroradiology, Medical University of Lublin, Poland

**Background:** Sport-related renal complications are common among athletes during intense or long-lasting physical activity. Most characteristic manifestations are proteinuria and hematuria. However, acute rupture of intrarenal artery in an otherwise healthy male causing severe hematuria during the workout is extremely rare.

**Case Report:** 44-year old male was admitted to the hospital complaining of pain in the left lumbar region and hematuria. Symptoms occurred during intense training at the gym. Laboratory blood and urine tests proved active bleeding. CT examination revealed blood clot in the bladder. The deteriorating condition of the patient was an indication for renal angiography which disclosed extravasation of the contrast medium in upper part of the left kidney. Embolization of the bleeding vessel was successfully performed. After 7 days of hospitalization the patient was discharged in a good clinical condition.

**Conclusions:** Prolonged exercise-induced hematuria causing deterioration of the patient's condition should be an indication for angiography which can disclose the source of active bleeding. Endovascular embolization of the bleeding vessel is the best treatment option.

**Keywords:** hematuria, intrarenal artery rupture, embolization, endovascular.

## **THE USE OF COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING IN THE DIAGNOSIS AND MONITORING OF TREATMENT OF BRAIN TUMORS IN CHILDREN**

Karol Bochyński, Katarzyna Drelich, Ignacy Rożek, Magdalena Woźniak, Dorota Sławińska

**Scientific supervisor:** -

Department of Pediatric Radiology, Medical University of Lublin, Poland

**Introduction:** Computed tomography (CT) and magnetic resonance imaging (MRI) are quite common methods used in imaging diagnostics. They are particularly valuable in the case of brain tumors. They allow for fairly quick detection of tumors, evaluation of their structure and size as well as the way of vascularization. They are used to both diagnose tumors and assess the effectiveness of their treatment.

**Methods:** In this work, the results of imaging studies of 50 selected patients hospitalized at the University Children's Hospital were analyzed in the period from 01/01/2017 to 31/08/2019, in which 110 CT and 280 MRI examinations were performed. The referring physician decided about the imaging method. The material included brain tumors both during diagnosis and monitoring of treatment and after treatment.

**Results:** The largest group of patients were patients diagnosed with pilocytic astrocytoma - 65% (33 patients). In 12% (6 patients) it was medulloblastoma, in 10% (5 patients) - glioblastoma, and in 8% (4 patients) - ependymoma. In 3% (2 patients) there were other diagnoses

**Conclusions:** CT and MRI are valuable brain tumor imaging studies. They enable the diagnosis of the tumor first, and through subsequent, control tests, help in choosing the optimal therapy.

**Keywords:** computed tomography, magnetic resonance imaging, CT, MRI, brain tumor, children, glioblastoma, ependymoma, medulloblastoma, pilocytic astrocytoma.

**BLESSING IN DISGUISE: CONGENITAL HEART DISEASE FACILITATES PRENATAL ULTRASOUND DIAGNOSIS?**

Filip Karuga, Bartosz Szmyd

**Scientific supervisor:** Prof. Maria Respondek-Liberska

Department of Prenatal Cardiology Polish Mother's Memorial Hospital, Medical University of Lodz, Poland

**Introduction:** Ultrasound (US) is the principal imaging modality used to diagnose and evaluate congenital heart disease (CHD), which is the most common birth defect worldwide, affecting 9.410 per 1000 newborns. Some of them may require emergent treatment in the newborn period to improve their survival. Mother's BMI, amniotic fluid index, foetal mobility and presentation are the factors which influence the precision and difficulty of prenatal US examination. During the 3rd trimester of gestation majority of foetuses assume cephalic presentation (left - GI or right - GII spine position). In our study we considered if foetuses with CHD have any predilection to any positions. It has never been reported before.

**Methods:** We analysed results of 1620 (control - 835, isolated CHD - 321, non-isolated CHD - 464) foetal cardiac US performed between June 2016 and September 2019 at the Department of Prenatal Cardiology. Only foetuses older than 20 hbd and singleton foetuses were enrolled into study. The following parameters: gestational age, foetal position (GI, GII; breech position- B; transverse presentation - T; oblique line - O), CHD, and noncardiac anomalies/defects were taken into consideration for further statistical analysis (chi-squared test; Statistica 13.1PL).

**Results:** Healthy foetuses revealed 41% of GI, 29% of GII, 18% of B, 10% of T, and 2% of O. In the case of isolated CHD these frequencies were equal to 40%, 43%, 10%, 6%, 1%. In the case of non-isolated CHD - 45%, 38%, 13%, 3%, 1%, respectively. There was observed statistically higher frequency of GII position among foetuses with CHD, as well as isolated and non-isolated CHD in comparison to healthy control ( $p < 0.0001$ ,  $p < 0.0001$ , and  $p = 0.0015$ , respectively). Further analysis in age groups:  $\leq 26$  hbd, 27-32 hbd, and  $\geq 33$  hbd revealed statistically significant differences in GII position among  $\geq 33$  hbd group of CHD foetuses (46%), especially isolated ones (51%) compared to healthy control (37%;  $p = 0.0292$  and  $p = 0.0049$ , respectively).

**Conclusions:** Foetuses with CHD had predilection to right cephalic position more often than healthy foetuses. As this factor determines the sensitivity of US examination, it should be mentioned in medical reports of prenatal ultrasound.

**Keywords:** ultrasound, fetal presentation, congenital heart disease.

## **BRONCHIAL ARTERY EMBOLIZATION (BAE) AS A TREATMENT OF HEMOPTYSIS – CASE REPORT**

Justyna Żyga, Aleksandra Porzucek, Jakub Niziołek

**Scientific supervisor:** Dr hab. n. med. Anna Drelich-Zbroja, lek. Maciej Szmygin

Department of Interventional Radiology and Neuroradiology, Medical University of Lublin, Poland

**Background:** Hemoptysis is an expectoration of blood or blood-stained sputum. Pulmonary bleedings typically accompany diseases of the respiratory such as bronchitis, bronchiectasis or lung cancers. Massive bleeding is associated with high mortality. Immediate diagnosis and active therapy are therefore essential. Bronchial Artery Embolization (BAE) is an effective and safe treatment modality for patients with massive hemoptysis.

**Case Report:** 23-year old farmer with no significant medical history was admitted to Pulmonology Clinic reporting massive hemoptysis for last 7 days. Control CT examination revealed pathological right pulmonary artery. Due to lab results indicating increasing anemia the patient was referred to Interventional Radiology Department for endovascular treatment. The urgent procedure of Bronchial Artery Embolization was performed. After 5 days the patient was discharged in a good clinical condition.

**Conclusions:** The diagnosis and treatment of hemoptysis in non-oncological otherwise healthy patients is challenging and difficult therefore requires thorough diagnostic evaluation and close interdisciplinary collaboration among pulmonologists, radiologists and interventional radiologists.

**Keywords:** BAE, hemoptysis, interventional radiology.

## THE EFFECTIVENESS OF I-131 THERAPY IN PATIENTS WITH NON-TOXIC NODULAR GOITRE

Barbara Emilia Nikitiuk, Karolina Niedzielska, Natalia Królik, Michał Sankowski

**Scientific supervisor:** Saeid Abdelrazek

Department of Nuclear Medicine, Medical University of Białystok, Poland

**Introduction:** Simple goitre is defined as the enlargement of the thyroid gland, when there are no evidences of autoimmune thyroid disease, malignancy, or inflammation. Radioiodine therapy (RAIT) is non-invasive, safe and cost effective method of therapy for goitre reduction. The aim of our study was to evaluate the short term efficacy of therapy using I131 to reduce thyroid volume in patients with non-toxic nodular goitre

**Methods:** We treated 980 patients, aged 20-90 years; (76%) of the studied groups were female and (24%) male; the mean radioiodine uptake (RAIU) was 39% and thyroid volume ranged between 44-170ml. Qualification of these patients were based on normal levels of serum fT3, fT4, TSH and characteristic appearance on thyroid scans and USG. Malignant changes were excluded in all suspected nodules by fine needle aspiration biopsy. The activity dose was calculated by the use of Marinelli's formula and ranged between 200 -800 MBq ( $459 \pm 171$  MBq). The mean absorbed dose was  $199.4 \pm 23.8$  Gy, and was proportional to thyroid volume. Thyroid ultrasonography, and thyroid scan with RAIU at 24hours was done before and after 12 months of RAIT. Follow up control for the evaluation of fT4, TSH was done every 6 weeks.

**Results:** A mean thyroid volume reduction of 48% was achieved after 12 months. Approximately half of the effect is obtained within the first 3 months. Euthyroidism persist in 92% of patients, and hypothyroidism develop only in 8% of patients. All patients were highly satisfied

**Conclusions:** Radioiodine is a non-invasive and effective method of therapy for reduction of the goiter volume. It should be used as first choice in every patient with non toxic nodular goitre with thyroid volume > 40 ml especially. Surgery should be reserved as first choice if malignancy is suspected. The reduction of thyroid volume with low percent of hypothyroidism, were obtained due to well accurate measurement of administered activity, relatively high effective half-life and well-organised follow up.

**Keywords:** iodine, radiotherapy, radioiodine, I 131, non toxic nodular goitre, simple goitre, thyroid gland.

## THE INDUCTION OF HYPERTHYROIDISM IN PATIENTS WITH NON-TOXIC GOITRE AFTER RADIOIODINE THERAPY

Karolina Niedzielska, Barbara Emilia Nikitiuk, Natalia Królik, Michał Sankowski

**Scientific supervisor:** Dr. Saeid Soleman Abdelrazek

Department of Nuclear Medicine, Medical University of Białystok, Poland

**Introduction:** Radioiodine therapy (RAIT) is a commonly used method during the therapy of non-toxic goitre. It is safe, non-invasive and cost-efficient. Although, one of the early side effects could be a temporary hyperthyroidism. Moreover, some of the researchers reported permanent hyperthyroidism after the therapy in some patients. The same results could have been observed in our patients.

**Methods:** Our study involved treating 980 patients, aged 20-90 years (76% female and 24% male). Qualification of patients were based on normal levels of serum fT3, fT4, TSH and characteristic appearance on thyroid scans and ultrasound. By fine needle aspiration biopsy, we excluded any malignant changes in suspected nodules. The mean radioiodine uptake (RAIU) was 39%. The thyroid volume ranged between 44-170ml. The activity dose ranged between 200 -800 MBq (calculated with Marinelli's formula). The mean absorbed dose was  $199.4 \pm 23.8$  Gy. Thyroid ultrasonography, and thyroid scan with RAIU at 24hours was done before and after 12 months of RAIT. Follow up control for the evaluation of fT4, TSH was done every 6 weeks.

**Results:** Permanent hyperthyroidism were induced in 12 patients ( 4 male and 8 female ), the mean age was 50 years. The mean thyroid volume in these patients was  $58.3 \pm 25.3$  ml and a mean RAIU at 24hour was  $48.2 \pm 13.4\%$ . These patients received a mean radioiodine dose of  $420 \pm 147.2$  MBq. Hyperthyroidism was induced between 4 and 6 months after therapy. Before RAIT, TSH receptor antibodies were negative and became positive in all patients after the therapy. RAIU at 24h increased in all the patients, and thyroid scintigraphy showed homogenous and diffuse uptake in both lobes with small reduction in the thyroid volume. To control the hyperthyroidism, antithyroid drugs were given to all the patients. Four patients were in euthyroid state and 8 patients received second dose of radioiodine. After the second dose, three patients achieved euthyroid state and five patients were in hypothyroidism.

**Conclusions:** Radioiodine therapy is safe, non-invasive and cost-efficient method of reducing the non-toxic goitre. It is a beneficial method even in patients with low radioiodine uptake. It should be used not only on patients with high operative risk or elderly. The induction of hyperthyroidism may occur as a result of activation of silent Graves' disease in these patients, yet it is a minor side effect, which could be treated with the second dose of radioiodine.

**Keywords:** radioiodine therapy, RAIT, hyperthyroidism, non-toxic goitre.



## **EMBOLISATION OF SUPERIOR MESENTERIC ARTERY BRANCH ANEURYSM - CASE REPORT**

Dominik Niemirski, Piotr Machowiec, Patryk Leszczyk

**Scientific supervisor:** Lek. Łukasz Światłowski

Dr hab. n. med. Anna Drelich-Zbroja

Students Scientific Assosiation of Interventional Radiology and Neuroradiology Department, Medical University of Lublin, Poland

**Background:** Visceral artery aneurysms include aneurysms of celiac trunk, superior mesenteric, or inferior mesenteric arteries and their branches. Despite their rarity (prevalence stands at 0,1-2%), it is significant to detect them, because mortality due to the rupture is high - it ranges from 25% to 100%, depending on their size and location. The possibilities of treatment include conservative management (in case of smaller aneurysms), invasive methods of vascular surgery or endovascular intervention.

**Case Report:** 56-year-old male patient was referred from the Vascular Surgery Department to the Interventional Radiology and Neuroradiology Department for the further evaluation and treatment of superior mesenteric artery branch aneurysm. After catheterisation of superior mesenteric artery and revealing the lesion using angiography, microcatheter was inserted to the aneurysm. Following assessment indicated that risk of ischemia after embolisation of the aneurysm is low, due to the collateral circulation. The embolisation using microspirals was successfully performed, with no visible complications in the control angiography.

**Conclusions:** The successful intervention confirmed high benefits in usage of interventional radiology methods as an effective treatment of visceral artery aneurysms. Endovascular intervention seemingly outperforms the methods of vascular surgery in such a cases, thanks to its precision and safety.

**Keywords:** embolisation, interventional, radiology, visceral, aneurysm.

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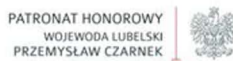
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