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«ГРОДНЕНСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ»

Факультет иностранных учащихся

МЕЖДУНАРОДНАЯ НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ СТУДЕНТОВ И МОЛОДЫХ УЧЕНЫХ «SCIENTIA INFINITA» ПРИУРОЧЕННАЯ К 30-ЛЕТИЮ ОСНОВАНИЯ ФАКУЛЬТЕТА ИНОСТРАННЫХ УЧАЩИХСЯ ГРОДНЕНСКОГО ГОСУДАРСТВЕННОГО МЕДИЦИНСКОГО УНИВЕРСИТЕТА

Сборник материалов

Гродно, 28 марта 2025 г.

Ministry of Health of the Republic of Belarus

GRODNO STATE MEDICAL UNIVERSITY

Medical Faculty for International Students of the Grodno State Medical University

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М 43 **Международная** научно-практическая конференция студентов и молодых ученых «Scientia Infinita» приуроченная к 30-летию основания факультета иностранных учащихся Гродненского государственного медицинского университета : сборник материалов (Гродно, 28 марта 2025 г.) [Электронный ресурс] [на англ. яз.] = International Scientific And Practical Conference «Scientia Infinita» dedicated to the 30th Anniversary of the Medical Faculty for International Students of the Grodno State Medical University, Belarus / М. Н. Курбат (отв. ред.). – Электрон. текст. дан. и прогр. (объем 3,1 Mb). – Гродно : ГрГМУ, 2025. – 1 электрон. опт. диск (CD-ROM).
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Сборник содержит материалы конференции студентов и молодых ученых, приуроченный 30-летию со дня основания факультета иностранных учащихся УО «Гродненский государственный медицинский университет». Представленные работы посвящены актуальным теоретическим и практическим аспектам медицины и будут полезны студентам, научным работникам и врачам всех специальностей.

Авторы, представившие информацию к опубликованию, несут ответственность за содержание, достоверность изложенной информации, указанных в статье статистических, персональных и иных данных.

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The collection contains materials of the conference of students and young scientists, dedicated to the 30th anniversary of the Medical Faculty for International Students of EI "Grodno State Medical University". The works presented are devoted to relevant theoretical and practical aspects of medicine and will be useful for students, researchers and doctors of all specialties.

The authors who submitted information for publication are responsible for its content and validity, as well as statistical, personal and other data specified in the paper.

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PECULIARITIES OF CHILDREN WITH WHOOPING COUGH

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Introduction. Pertussis is a respiratory tract infection that can occur at any age but is most common and most likely to be fatal in young children, particularly infants at first 6 months. This infection is a vaccine-preventable childhood disease that is endemic throughout the world and has been increasing within recent years. Unvaccinated patients may become ill; furthermore, unvaccinated adolescents and adults are important *B. pertussis* carriers and thus are often the source of infection for unvaccinated infants during 1 year (who have had the highest increase in annual incidence and the highest case fatality rate). Virulence of outbreak strains may be increasing. One attack does not confer lifelong natural immunity, but secondary attacks and infections in previously vaccinated adolescents and adults whose immunity has waned are usually mild and often unrecognized.

Aim of the study. To determine the peculiarities of whooping cough among hospitalized patients treated at the Grodno State Clinical Hospital between 2023-2024.

Materials and methods. A review of 113 medical records of patients discharged from the Grodno Regional Infectious Diseases Clinical Hospital with a verified whooping cough for the period 2023-2024 was performed. Statistical analysis was carried out using Google Colaboratory I, the "Statistics" package, v.10, and the Excel program.

Results and discussion. Clinical evaluation of 113 children (0-18 years) was done, where there were females 54.9% (62 patients) and males 45.1% (51 patients). Majority of patients were kids less than 5 years old (total 62.8%, of these children 0-1 years – 30.1% (34 patients), 1-5 years – 32.7 % (37 patients). School-age children (6-10 years) numbered 23 (20.4%), adolescents (11-17 years) made19 patients (16.8%).

In diagnosing whooping cough, PCR analysis confirmed *B. pertussis* and *B. parapertussis* DNA in 85.19% (1 case *B. parapertussis*, 7 cases without verification but diagnosis was confirmed epidemiologically by close contacts (siblings). Additionally, 51.85% cases required an enzyme-linked immunosorbent assay (ELISA) to confirm the diagnosis.

Clinical evaluation of 113 children revealed that 62.96% were appropriately vaccinated against Diphtheria, Tetanus & Pertussis (DTP), crucial for reducing morbidity and mortality.

White blood cell count indicated that 33.33% demonstrated a normal WBC count (4-9 x 10^9/L). In contrast, 48.15% exhibited 10-19 x 10^9/L, 14.81% had levels ranging from 20-29 x 10^9/L and in 3.70% had a markedly elevated count of 30 x 10^9/L. Additionally, in 29.63% cases erythrocyte sedimentation rate (11 mm/h) had elevated, warranting further investigation.

In terms of treatment, most children received appropriate antimicrobial therapy. 77.78% were given macrolide antibiotics, 18.52% kids did not receive antibiotics, raising concerns about their management.

Conclusion. More than 60 % of patients with whooping cough were kids of 0-5 years old (62.8%). Adolescents made only 16.8 %, but they could be an important carrier for *B. pertussis* and are thus often the source of infection for unprotected infants.

The findings indicate that while a majority of the children were vaccinated and diagnosed with pertussis. Continuous public health efforts must focus on confirming the importance of booster dose of DTP (or mono vaccine against whooping cough) around adolescent and pregnant women to prevent and protect the most sensitive to whooping cough groups (infants of first 6 months).

SUBCUTANEOUS DIROFILARIASIS IN A 60-YEAR OLD FEMALE IN GRODNO REGION, BELARUS

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Introduction. The vector-borne zoonotic helminth illness dirofilariasis, which is caused by *Dirofilaria immitis* and *Dirofilaria repens*, is a significant concern in the European Union, particularly in such countries as Belarus, Russia, and Ukraine. The symptoms appear due to the movement of immature helminths in human tissues or because the internal organs have a lengthy course and progressive maturation.

Aim of the study. This case study hopes to bring more awareness and understanding about human subcutaneous dirofilariasis. Also, it is important to suspect the presence of dirofilariasis even in non-endemic areas when the patient comes with a similar clinical presentation as we have discussed here.

Materials and methods. A 60-year-old woman was diagnosed with a spherical, elastic, smooth, and painless tumor-like formation in her scalp. The tumor was asymptomatic and spherical. The patient underwent surgical intervention, including excision of the tumor-like formation, under local anesthesia. The wound was treated with hemostasis, sutures, and a small amount of fluid was released.

Results and discussion. A patient in Belarus was diagnosed with dirofilariasis of the subcutaneous fat of the right temporal region after undergoing surgery. The condition is rare in Belarus, but there is a high probability of autochthonous transmission due to the discovery of an adult heartworm in a wild wolf and increasing human cases in mosquitoes. Diagnosis involves clinical indicators, parasitological, serological, histological,

ultrasonography, and molecular approaches.

Conclusion. Dirofilariasis of the subcutaneous fat is a rare zoonotic helminth disease in Belarus. A patient was initially diagnosed as an epidermal cyst, but a preoperative ultrasound examination and blood count led to the suspicion of dirofilariasis of the subcutaneous fat, where the postoperative pathohistological examination confirmed the diagnosis. Early diagnosis is crucial to reduce patient suffering and raise awareness about this rare helminth disease.

EXPERIENCE IN THE TREATMENT OF LIVER ECHINOCOCCOSIS IN GRODNO REGION, BELARUS

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Introduction. The tapeworm echinococcus causes liver echinococcosis, a parasitic hydatid disease that is a global health concern. The larval stages of taeniid cestodes belonging to the Echinococcus family are the cause of echinococcosis, a serious liver disease. Although six species have been identified, four *Echinococcus granulosus*, *Echinococcus multilocularis*, *Echinococcus vogeli*, and *Echinococcus oligarthrus* are of general concern for human health. Recently, two novel species have been identified: *Echinococcus felidis* in African lions and *Echinococcus shiquicus* in small vertebrates from the Tibetan level. Humans occupy a middle position in the life cycle of parasites, and the clinical signs can vary and be non-specific depending on the size and intensity of the cyst. The complications include bleeding, perforation, suppuration, cyst rupture, mechanical jaundice, and portal hypertension.

Aim of the study. Surgical analysis of treatment.

Materials and methods. Instrumental and laboratory diagnostic methods were used for every patient. The tests include a general blood test, a biochemical blood test (IFA) to identify antibodies to the echinococcus antigen, abdominal ultrasound and MRI, retroperitoneal area CT of the belly and chest, and a brain scan to look for further echinococcus foci. Ultrasonography clarifies the presence of problems, particularly in liver and lung diseases, as well as the internal structure, number, and location of cystic structures. The hydatid cysts were discovered to be hypoechoic, double-configured forms on ultrasonography. The external hyperechogenic layer was represented by a fibrous capsule composed of fibrous tissue. The innermost layer of hyperechogenic tissue was called the chitinous shell. From 40.6-36.4 mm to 160-105 mm, the echinococcal cysts' sizes varied. The liquid of the hypoechoic layer was visible in the space between the two forms. Hyperechogenic inclusions, which are components of the echinococcus germ, were also discovered inside the cyst. It was demonstrated that the parasite cysts generated both hyperintense and hypointense MRI echoes. A CT scan revealed one

echinococcus in the patient's left lung, but no parasite cysts were seen in the brain. In the whole blood test, seven patients with hepatic echinococcosis had an elevated ESR, and the blood leucocyte formula had more eosinophils. In nine instances, biochemical testing revealed that an increase in all immunoglobulin types led to an increase in total blood plasma protein. To find antibodies to echinococcus antigens, ELISA was used to analyze blood samples from 24 patients. In the whole blood test, seven patients with hepatic echinococcosis had an elevated ESR, and the blood leucocyte formula had more eosinophils. Biochemical testing revealed that in nine of the cases, a rise in all types of immunoglobulins was responsible for an increase in total blood plasma protein. ELISA was used to analyze blood samples from 24 patients in order to identify antibodies.

Results and discussion. There were 17 women and 10 men among the 27 patients that took part in this study. The patients ranged in age from 18 to 83 years old. Three people were referred to the "Minsk Scientific and Practical Centre for Surgery, Transplantation and Hematology" because they had significant liver cysts. The cysts of the two individuals were 160x105 mm and 104x86 mm. The third patient was transferred after undergoing two liver surgeries. Liver resection procedures were performed using a water jet dissector, LigaSure technology, and an ultrasonic scalpel. In cases when serious bleeding is possible, patients were prepared for total vascular isolation of the liver before surgery, which helps minimize blood loss. This method generally involves separating and removing the hepatoduodenal ligament and the lower hollow vein in its supra and subhepatic sections on the turnstiles. According to these tomograms, the liver's postoperative hypertrophy left lobe is sufficiently massive to guarantee the organ's regular operation. On days 12-18 all patients were released for outpatient therapy; there were no postoperative complications or deaths in our instances.

Conclusion. Regardless of the size and location of the cysts, patients with echinococcosis should have surgical treatment. Minimally invasive surgical techniques cause the least amount of trauma. The two most reliable diagnostic tests for echinococcosis are ultrasound and MRI. Total vascular isolation is preferred to regulate blood loss during operation

COMPARATIVE STUDY OF THE FREQUENCY OF ATRIAL FIBRILLATION IN PATIENTS WITH HYPERTENSION OF VARYING SEVERITY

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Introduction. Atrial fibrillation (AF) is the most common arrhythmia among patients with hypertension, which significantly increases the risk of stroke, heart failure, and other cardiovascular complications. Studies show that up to 40% of patients with hypertension may develop AF. This disease is

associated with left atrial hypertrophy, fibrosis, and changes in the electrophysiological properties of the myocardium, which is a consequence of prolonged high blood pressure. Understanding the relationship between the degree of hypertension and the frequency of AF is critical for more effective diagnosis and the development of prevention and treatment methods.

Aim of the study. The aim of this study is to assess the incidence of AF among patients with hypertension of varying severity, as well as to investigate the mechanisms that contribute to its development and the effect of the degree of hypertension on the occurrence of arrhythmias.

Materials and methods. The study included 300 patients with hypertension aged from 45 to 70 years, who were divided into three groups depending on the severity of hypertension: mild (systolic BP <140 mmHg, diastolic <90 mmHg), moderate (systolic BP 141-160 mmHg, diastolic 91-100 mmHg) and severe hypertension (systolic BP> 160 mmHg, diastolic > 100 mmHg). AF was diagnosed using a 12-lead ECG and Holter monitoring for 24-48 hours. The incidence of AF was recorded for each group. A statistical analysis was performed to identify the relationship between the severity of hypertension and the likelihood of developing arrhythmias.

Results and discussion. The frequency of AF increased depending on the severity of hypertension. In the group with mild hypertension (systolic BP <140 mm Hg and diastolic <90 mm Hg), AF was detected in 12% of patients (36 out of 300). In the group with moderate hypertension (systolic BP 141-160 mm Hg, diastolic 91-100 mm Hg), AF occurred in 25% of patients (75 out of 300). In the group with severe hypertension (systolic BP> 160 mmHg, diastolic BP >100 mmHg), AF was diagnosed in 40% of patients (120 out of 300). These data show that severe hypertension significantly increases the likelihood of developing AF.

The mechanisms that contribute to the development of AF include structural changes in the myocardium, such as left atrial hypertrophy and fibrosis. Increased pressure in the heart leads to stretching of the atrium, thickening of its walls and disruption of the normal conduction of electrical impulses, which creates conditions for the circulation of electrical waves. In addition, hypertension activates the renin-angiotensin-aldosterone system, which contributes to further myocardial fibrosis and deterioration of conduction, which ultimately contributes to the development of fibrillation.

Conclusion. The data obtained confirm that hypertension, especially in severe forms, significantly increases the risk of developing AF. This emphasizes the importance of early diagnosis and control of blood pressure, especially in patients with severe hypertension. Regular monitoring of blood pressure and effective treatment of hypertension can significantly reduce the likelihood of arrhythmias and other cardiovascular diseases, improving the prognosis and quality of life of patients. For patients with severe hypertension, it is necessary to ensure more careful medical supervision, including the use of modern diagnostic methods to detect early signs of AF and other cardiac disorders.

SYNONYMY IN ANATOMICAL TERMINOLOGY

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Introduction. Modern medical terminology is ingrained in languages all around the world and serves as the foundation for the results of extensive historical development. Latin terminology, which serve as the foundation for all medical discourse texts, are the subject of this study.

Aim of the study. The aim of our research is to explain and categorize synonymic nouns and adjectives in Latin anatomical terminology, taking into account term functional consistency. The following tasks will be addressed in order to accomplish the goal: 1) identifying terms with comparable semantic nests and meanings; 2) establishing criteria for semantic differentiation of the terms within these groups; 3) creating classifications of terms-synonyms.

Materials and methods. During the research, we used the following methods: comparative method, method of structural and semantic analysis, method of linguistic description.

Results and discussion. Three categories of synonyms can be identified based on how semantically similar they are. Group 1: synonyms that are completely synonymous in both meaning and usage. Nouns in Group 2 are distinguished by their historical compatibility with other terms. Their existence could be caused by a number of things, such as the fact that different experts may have given the same object multiple names. Group 3 consists of phrases with comparable meanings that are used to represent various concepts. We refer to these concepts as quasi-synonyms. A number of things that are similar in structure and function and can be identified by their location and morphological similarity make up the human body.

Conclusion. When examining contemporary anatomical terminology and differentiating between words with similar meanings, as well as assessing the compatibility of these terms in the Latin language, three categories of synonymous nouns have been identified. It has been observed that the characteristics used to differentiate Latin quasi-synonyms in anatomical terminology vary significantly and can reflect attributes such as the shape of an object, type of tissue, morphological similarities, and location. Additionally, an analysis of the limited group of Latin adjective synonyms indicates that they may fit into Group 2 of this classification, as the selection of an adjective largely depends on its compatibility with the associated noun. Future research opportunities lie in further investigating synonymous nouns and adjectives. Furthermore, a comprehensive analysis of the anatomical term system is warranted due to the current disorganization within anatomical terminology.

A SPORADIC CASE OF SEVERE LEPTOSPIROSIS WITH A SHORT RECOVERY PERIOD

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Introduction. Leptospirosis, a globally significant zoonotic infection, is predominantly found in tropical and subtropical areas. While most cases are mild or asymptomatic, severe forms may lead to fatal outcomes. With an estimated >1 million cases and 59,000 deaths annually, leptospirosis presents various prognostic challenges. High mortality is often associated with complications such as hemorrhagic ARDS, acute renal failure, disseminated intravascular coagulation (DIC), and septic shock. The case described herein involves a severe form of leptospirosis with an unexpectedly shortened recovery period.

Aim of the study. This case suggests the need for further randomized controlled trials in managing severe leptospirosis and to refine clinical treatment guidelines.

Materials and methods. 1. Literature review of severe leptospirosis management. 2. Analysis of patient's case-record.

Results and discussion. A 31-year-old male presented to Erebouni Medical Centre in December 2023, diagnosed with the severe icteric form of leptospirosis, confirmed by real-time PCR for Leptospira DNA. The patient was admitted on the 6th or 7th day of illness, complaining of malaise, anorexia, fever, jaundice, and severe leg pain. Laboratory investigations revealed the following abnormalities consistent with hepatorenal syndrome: Hyperbilirubinemia, liver enzymes elevation, hypercreatinemia, lactatemia, hyperglycemia, hypoalbuminemia, anemia, thrombocytopenia, leukocytosis.

The patient was managed with methylprednisolone (iv. 500 mg daily), ceftriaxone (iv. 2.0 g daily), doxycycline (p/o 100 mg twice daily), hemodialysis, plasmapheresis (1 session).

Conclusion. Despite the presence of several poor prognostic factors, such as jaundice, thrombocytopenia, leukocytosis the patient demonstrated a favorable and rapid recovery. This case suggests that corticosteroid therapy, specifically methylprednisolone, may contribute to a reduction in mortality and a shortened recovery period in severe leptospirosis. The immunomodulatory and anti-inflammatory effects of corticosteroids may play a role in mitigating the systemic inflammation associated with this infection. However, further randomized controlled trials are essential to substantiate the effectiveness of corticosteroids in managing severe leptospirosis and to refine clinical treatment guidelines.

AN ACUTE CASE OF AMIODARONE INDUCED PULMONARY TOXICITY

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Introduction. Amiodarone is a commonly used class III antiarrhythmic drug. It has been associated with various adverse effects. One of the very severe side effects is amiodarone induced pulmonary toxicity. Early detection of this pathology has a better prognosis.

Aim of the study. To emphasize the significance of exercising caution when treating patients with amiodarone, as it can lead to amiodarone induced pulmonary toxicity. This knowledge will help medical professionals remain vigilant in their treatment and monitor potential adverse effects associated with the drug.

Materials and methods. We describe a case of a 57-year-old male with progressive dyspnea, who had a history of atrial fibrillation and was treated with amiodarone and who finally got diagnosed with amiodarone induced pulmonary toxicity and also how this complication was managed.

Results and discussion. A 57-year-old male, with a history of episodes of atrial fibrillation paroxysms, had been treated with amiodarone for a year. His symptoms presented shortly after an increased dosage of amiodarone to 200 mg continuously 1-2 times daily for 2 months. He presented to the emergency department of Grodno City Clinical Hospital with progressive dyspnea. After admission, according to the findings on chest X-ray, he was initially diagnosed with interstitial pneumonia. Although he was treated for pneumonia, there was no improvement of dyspnea. Due to this, a CT of the chest with contrast was performed, which showed pulmonary fibrosis. He was prescribed methylprednisolone 32 mg per day. After 2 weeks, he was discharged with a diagnosis of community-acquired bilateral pneumonia, which led to interstitial pulmonary fibrosis. At the time, his treatment with amiodarone was not considered as a possible cause of lung pathology. On the day of discharge, he was prescribed with a decreased dose of 16 mg methylprednisolone per day. After 2 weeks of continuation of methylprednisolone along with amiodarone for treatment of atrial fibrillation, he presented to hospital again due to ineffectiveness of the treatment. The patient complained of severe shortness of breath even at rest, and minimal physical exertion while walking. Radiological examinations were repeated. X-ray examination revealed signs of pulmonary fibrosis with decreased airspaces on the lower part of both lungs. CT showed ground-glass opacity along with signs of paraseptal emphysema. After observing these findings, they came to conclusion that these changes might have corresponded to amiodarone induced pulmonary toxicity. Hence, the patient was

asked to discontinue amiodarone and was prescribed methylprednisolone 16 mg per day in the morning after breakfast for 3 months. He was advised to control blood pressure and heart rate, and to follow with CT of chest once in 3 months. He was also asked to visit for follow-up once in 2 weeks to correct the dose of methylprednisolone by 4mg every 2 weeks. After several months, a CT was done after initiation of treatment. The CT showed positive dynamics. Large parts of ground-glass opacity areas previously determined on both lungs were not visualized with only residual non-intensive areas of ground-glass opacity. General condition of the patient improved and he felt much better. He was advised to continue the treatment prescribed. Based on improvement of symptoms upon discontinuation of amiodarone, he was finally diagnosed with amiodarone induced pulmonary toxicity.

Conclusion. It is important to monitor carefully and do regular follow-ups for patients taking amiodarone, and to take into consideration that amiodarone induced pulmonary toxicity could occur in those patients. For early diagnosis of amiodarone induced pulmonary toxicity, it is important to educate patients about potential adverse effects and importance of prompt reporting of any new symptoms to their physician before starting treatment with amiodarone. There are no specific diagnostic criteria for amiodarone induced pulmonary toxicity. In the present case, the patient was diagnosed based on his medical history, clinical symptoms, radiographic findings along with progressive improvement of patient's condition after discontinuation of amiodarone from his treatment plan.

C-REACTIVE PROTEIN/ALBUMIN AND D-DIMER AS BIOMARKERS OF SEVERE SEPSIS

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Introduction. According to the WHO, from the data collected in 2020 there were 48.9 million cases and 11 million sepsis related deaths worldwide. Infection is a powerful trigger of inflammation, and studies have been reported correlating CRP with severity and long-term mortality in patients with sepsis at discharge. CRP/albumin will be a better prognostic marker than CRP alone. The prognostic value of D-dimer in sepsis remains controversial.

Aim of the study. To establish the serum CRP/albumin ratio and D-dimer as useful markers for predicting prognosis in 20 critically ill ICU patients who were admitted in Grodno Regional Infectious Disease Hospital between the year 2023 and 2024.

Materials and methods. 20 medical cases of patients hospitalized with a diagnosis of sepsis in the ICU department were analyzed. Statistical processing of the material was carried out using the StatTech v. 4.7.2 software package,

Russia, using nonparametric methods and Excel.

Results and discussion. Of 20 patients in sepsis, 12 were males (60%) and 8 were females (40%). Mean age was 56.5 [32.0;63.0]. Mean bed-day was 15.5 [12.75;25.0]. 35% of the patients were documented to have pyretic fever (39-39.9%), 40% had headache, 85% weakness, 90% with sore throat, 15% with rash, 5% with cough, 10% cases with hypotension, 25% patients required mechanical ventilation. According to the review, GCS score 3-8 (5.0%), in 50% cases a PaO_2 less than 75 mmHg, Me SOFA was 4.0 [3.0;6.5], n=19. 65% of the patients had at least one organism isolated from either the blood culture, throat culture sputum culture, urine culture, stool culture, rectal smear, and CSF culture. Some patients had organisms isolated from different sources while some had multiple organisms isolated from the same source. Out of the twenty patients, 5 (25%) of them died.

An inverse correlation was established between SpO2% and CRP / albumin=0.482 (p=0.37) and a direct correlation between ESR and CRP/albumin, r 0,544 (p=0.013). A significant direct correlation was established between CRP/albumin and d-dimer=0.591 (p=0.013). According to the obtained data, when comparing d-dimer depending on gender, we found statistically significant differences and Me was higher in female patients 19.58 [3.56; 21.60], (p=0.025), Mann-Whitney U-test. D-dimer is a statistically significant predictor of sepsis severity depending on gender (AUC=0.829; 95% CI: 0.613 1.000, p=0.025). Severe condition was predicted with a d-dimer value 19.58 (Youden index). The sensitivity and specificity of the resulting model were 57.1% and 100.0%, respectively.

Conclusion. CRP/albumin ratio is a biomarker for predicting prognosis in patients with severe sepsis. A significant direct correlation was established between d-dimer and CRP/albumin. Severe condition in female patients was predicted with a d-dimer value 19.58. Therefore, studies on a larger number of patients are needed to confirm these results and establish the serum CRP/albumin ratio as a useful marker for long-term prediction of mortality in ICU patients.

MUSCULAR MANIFESTATION OF MILD ANXIETY AND MILD STRESS IN STUDENTS

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Introduction. A review of scientific literature shows that moderate anxiety is a prerequisite for good academic performance and responsibility in everyday life.

Mild anxiety and mild stress can have not only mental but also physical manifestations.

Anxiety is an emotion or feeling of uneasiness, fear and worry that can be experienced by people regardless of age, gender and ethnicity. It can be caused due to several factors and symptoms of anxiety vary according to each individual. Symptoms of anxiety can include psychological as well as physical symptoms. The article reviews the correlation between mild anxiety, mild mental stress, and tension in the levator scapulae muscle.

Aim of the study. 1.To investigate the correlation between mild anxiety, mild mental stress, and tension in the shoulder blade lifting muscle. 2.Analyze the gender differences in the results obtained. 3.Compare the results obtained from international students and local students.

Materials and methods. The study was conducted among foreign and local 5^{th}-and 6^{th}-year students of Grodno State Medical University. The study involved 30 volunteers, of which: males – 19, females – 11. The study was conducted by palpation of the shoulder blade lifting muscle.

Two parameters were evaluated: muscle tension, muscle soreness.

Results and discussion. The study showed that the tension of the shoulder blade lifting muscle was detected in 28 students, which is 93.3% of cases.

No tension of this muscle was detected in 2 students (6.7% of cases).

In the group of international students, tension in the shoulder-lifting muscle was observed in 16 people (53.6% of cases). There are 14 people in the group of local students (46.4% of cases). It was found out that the left side shoulder blade muscle tension was more common than the right side in both genders in both local and foreign student groups and the frequency of detection of tension was higher in females comparatively to males.

Conclusion. 1.Mild anxiety and mild stress on a physical level are manifested by tension in the shoulder blade lifting muscle. 2.This pattern is noted by both international students and local students. 3.In females, tense muscles of the shoulder blade are detected more often than in males, both in foreign and local student groups.

Based on the results obtained, we can assume that females are more anxious than males. We can assume that females' increased anxiety will correlate with their higher academic performance.

INDICATORS OF THE RETICULOCYTE HEMOGLOBIN EQUIVALENT IN PREMATURE NEWBORNS OF THE GRODNO REGION

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Introduction. Preterm infants are at a higher risk of developing iron deficiency anemia. Reticulocytes develop from erythroblasts following

hemoglobin synthesis and transform into mature red blood cells in 1-2 days upon entering the peripheral blood. Therefore, the reticulocyte hemoglobin equivalent (Ret-He) is a representation of instantaneous hemoglobin synthesis. This parameter allows the early diagnosis of iron deficiency anemia and even the early restorative effects of iron therapy. Ret-He is the fastest way to identify changes in the current iron supply and also the quality of the cells.

Aim of the study. To analyze data from the anamnesis, clinical picture, laboratory (the level of Ret-He content in capillary blood) and instrumental tests on admission of pre-mature infants.

Materials and methods. A retrospective analysis of 67 case reports of pre-term babies that were admitted to the Grodno Regional Children's Hospital during the period of January 2024 to November 2024 was studied. Statistical analysis was carried out using the application package "STATISTICA 10.0" and "EXCEL".

Results and discussion. According to the analysis of the case reports, 47% of the babies studied were boys, while the remaining 53% were girls. The proportions of the modes of delivery are as listed; c-section 60 (89.6%), vaginal delivery 7 (10.4%). The average parameters at birth of the babies were as follows: birth length 45 [41;47] cm, birth weight – 1950 [1420;2410] g, head circumference 31 [28;32] cm. The gestational age of the pre-term newborns was 33 [30;36] weeks. Obstetric history data showed the following: threatened miscarriages were diagnosed in 22 (32.8%) cases, pre-eclampsia in 11 (16.4%), acute respiratory diseases in 22 (32.8%), other diseases in 62 (92.5%) cases. A total of 24 (35.8%) mothers had anemia. The total number of babies receiving only breast milk – 16 (23.9%), receiving only formula 28 (41.8%) and receiving both expressed breast milk and formula 23 (34.3%).

According to clinical manifestations congenital infection was established in 53 (79.1%) pre-term newborns, respiratory distress syndrome in 48 (71.6%), central nervous system depression syndrome in 29 (43.3%), intrauterine hypoxia in 19 (28.4%), heart failure in 6 (9%). According to the ultrasound investigations there were 19 babies (28.4%) recorded with the widening of the posterior horns of lateral ventricles on the sagittal plane. Total of 23 babies were recorded with signs of brain cysts 17 (25.4%) choroid plexus cysts and 6 (9%) of subependymal cysts were visualized. 30 of the total babies (44.8%) had signs of immaturity of the cerebral structures. The echocardiographic studies of the babies indicate that the number of babies with ventricular septal defect (VSD) was 5 (7.5%), with atrial septal defect (ASD) 27 (40.3%). On the lung fields of x-rays of the observed babies 12 (17.9%) had signs of pneumonia.

Upon admission to the hospital according to the laboratory studies in 12 premature babies the level of Ret-He was determined in complete blood count at the age of 6 (4.0;8.0) days and was equal: 33.6 [32.15;35.15] pg which corresponded to normal values in the first weeks of life. Reference values for Ret-He in premature infants are 27-34 pg.

Conclusion. At the time of admission to the hospital the level of Ret-He in premature infants corresponded to the age standards, which requires definition in dynamics to identify early diagnosis of iron deficiency in premature infants.

INFLUENCE OF AN ACID SPHINGOMYELINASE INHIBITOR ON ADVANCED GLYCATION END PRODUCTS IN THE RAT SOLEUS MUSCLE UNDER 14-DAY FUNCTIONAL UNLOADING

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Introduction. Prolonged bed rest, limb immobilization, and exposure to microgravity during space flight can lead to atrophic changes in postural skeletal muscles. It has been shown that one of the key mechanisms underlying these changes is an increase in muscle ceramide (Cer) levels due to the activation of sphingomyelinase-mediated hydrolysis of sphingomyelin. In particular, the inhibition of acid sphingomyelinase (ASM) enables to lower Cer levels and mitigate muscle atrophy (Bryndina I.G. et al., 2021; Protopopov V.A. et al., 2024). It has also been shown that the signaling pathway of advanced glycation end products (AGEs) realized through their RAGE receptor is upregulated in hindlimb muscles after 7 days of unloading (T. Egawa et al., 2021). However, it is unclear whether there is a direct relationship between changes in the sphingolipid pathway (ASM/Cer) and the AGE/RAGE signaling pathways.

Aim of the study. To investigate the effect of ASM inhibitor on the levels of Cer, RAGE and AGEs in rat soleus muscle under 14-day functional unloading.

Materials and methods. Experiments were conducted on male white rats weighing 200-250 g. Functional unloading of skeletal muscles was modeled according to the Ilyina-Novikov method, modified by Morey-Holton (hindlimb suspension, HS). The rats (n=18) were divided into three groups: (1) intact control, (2) HS for 14 days, (3) HS for 14 days with administration of ASM inhibitor amitriptyline.

To determine the influence of the AGE signaling pathway on ASM activation and Cer levels in the soleus muscle, an *ex vivo* experiment was performed on male white rats (n=4). In this experiment, one soleus muscle of each rat was incubated in physiological saline (Krebs solution) with AGEs, while the contralateral muscle was incubated without AGEs and served as a control. After the end of HS, muscles were removed under general anesthesia.

In the *in vivo* experiment, Cer, ASM, RAGE, AGEs and reactive oxygen species (ROS) levels were assessed in muscle cross sections by fluorescence microscopy using appropriate antibodies and reagents. Western blot analysis was performed to determine RAGE levels, with GAPDH as a loading control. In the *ex vivo* experiment, Cer and ASM levels were also detected by fluorescence microscopy. Image analysis was performed using NIS-elements D and ImageJ software. Statistical analysis was carried out with Statistica 6.0 and RStudio using the Kruskal-Wallis and Mann-Whitney tests. Differences were considered statistically significant at $p<0.05$.

Results and discussion. Fourteen-day functional unloading led to an increase in Cer, ASM, ROS, AGEs and RAGE, as confirmed by fluorescence microscopy data. Western blot analysis revealed a significant increase in RAGE compared to the control group. The inhibition of ASM decreased ASM and Cer levels, but had no effect on AGEs or RAGE in comparison with the untreated group. No changes in RAGE were observed by WB under these conditions. In the *ex vivo* experiments, exogenous AGEs added to soleus muscle samples, did not induce detectable changes in Cer or ASM muscle levels.

Conclusion. Thus, 14-day unloading leads to ASM/Cer upregulation and increase in AGE and RAGE levels in the soleus muscle. ASM inhibitor amitriptylin does not affect RAGE and AGEs, indicating the absence of the direct interaction between ASM/Cer and AGEs/RAGE pathway in muscles.

CARDIOVASCULAR RESPONSE TO PHYSICAL ACTIVITY AND ADDITIONAL WEIGHT LOAD IN MALE AND FEMALE STUDENTS

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Introduction. There are various functional load tests to study the state of the cardiovascular system, which allow identifying the latent stage of cardiovascular pathology, as well as assessing the reactivity of the cardiovascular system. This is relevant, since it allows assessing the functional reserve of the body, as well as identifying cardiovascular pathology in its compensated stage.

Aim of the study. The aim of the study was to conduct a new load test, which included, in addition to physical activity, an additional weight load.

Materials and methods. The studies were conducted on 29 students of both sexes (18 girls and 11 boys) aged 18-25 years. The studies included students climbing two flights of stairs with a total of 28 steps. The initial arterial systolic and diastolic pressure, as well as systolic and diastolic pressure and their changes following physical activity after students climbed and after students climbed the stairs with a 10 kg load were determined. The changes in pulse pressure and heart rate were also determined. The obtained data were processed using nonparametric statistics methods, the data were expressed as a median and the lower and upper quartiles. The data was considered reliable at $p<0.05$.

Results and discussion. As a result of the studies, the initial systolic pressure in girls was 115.5 [102; 122] mm Hg, diastolic pressure was 76.0 [70; 80] mm Hg. In young men, the initial systolic pressure was 129.0 [116; 136] mm Hg, $p<0,05$, diastolic pressure was 75.0 [69; 83] mm Hg. The initial pulse pressure in girls was 45.5 [35; 50] mm Hg, in young men – 53 (41; 62) mm Hg, $p<0,05$. The initial heart rate in girls was 82 [73; 90] beats per minute, in young men it was 81 [65; 91] beats per minute. After performing the load by climbing

stairs, there was an increase in both systolic (in girls – by 13.3 [6.9; 19.1]%, in boys – by 8.3 [1.9; 8.8]%) and diastolic pressure (in girls – by 10.5 [3.8; 14.5]%), but it decreased in boys by 2.2 [10.0; 16.4]%, $p<0,05$. Pulse pressure after the load in girls increased by 24.5 [5.7; 37.0]%, and in boys – by 25.9 [19.5; 36.1]%, $p>0.05$. Heart rate increased in girls by 12.5 [2; 27]%, in boys – by 22 [8; 29]%, $p<0,05$. After performing the load by climbing stairs with additional weight, there was an increase in both systolic (in girls – by 22.5 [19.0; 24.0]%, in boys – by 19.2 [14.7; 24.7]%) and diastolic pressure (in girls – by 10.5 [1.4; 16.5]%, but in boys it decreased by 4 [14.8; 14.9]%). Pulse pressure after exercise in girls increased by 44 [26; 52.2]%, and in boys – by 28.1 [15.1; 58.5]%, $p<0,05$. Heart rate increased in girls by 15.8 [2.4; 38.5]%, in boys – by 33 [14; 42]%, $p<0,05$.

Conclusion. During the exercise tests, some differences in the response of the cardiovascular system of girls and boys to exercise were revealed. In particular, girls showed a more significant increase in systolic blood pressure, as well as pulse pressure, but boys showed a more significant increase in heart rate, and the diastolic pressure value decreased, unlike girls, in whom it increased.

During physical exercise by climbing stairs with an additional load, the increase in systolic pressure was greater, than when climbing stairs without an additional load, while there were no differences in the increase in systolic pressure in girls and boys. As for diastolic pressure, in boys, in contrast to girls, it was noted to decrease, and to a greater extent than without an additional load. In girls, the increase in pulse pressure increased, and in boys, a higher increase in heart rate was noted.

DOUBLE OUTLET RIGHT VENTRICLE IN COMBINATION WITH MULTIPLE CONGENITAL HEART DEFECTS

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Introduction. Double outlet right ventricle (DORV) is characterized by both great arteries, aorta and pulmonary artery arising from the right ventricle. Here both large arteries are fully or partially connected to the right ventricle, more than 50% of each great vessel arises from the right ventricle, which is known as “the 50% rule”. DORV can occur as a single condition or in combination with other cardiac or noncardiac anomalies. This condition is rare and estimates about 1%-1.5% of all congenital heart diseases.

Aim of the study. Analysis of the treatment plan with respect to this complex case of double outlet right ventricle and its associated cardiac anomalies.

Materials and methods. The patient in this case study was examined at the Grodno Regional Children’s Hospital. Patient details are kept confidential, while

the article is written anonymously. Information was collected by analyzing the case history of this 9-year-old female patient which includes daily observation of the patient using clinical, functional and laboratory investigations.

Results and discussion.

A 9-year-old girl presented to the children's hospital with shortness of breath. She is a patient with congenital heart disease that is double outlet right ventricle complicated with severe hypoplasia of the right ventricular outflow tract, pulmonary trunk and left pulmonary artery. In addition, the patient also has a complete atrioventricular communication, secondary atrial septal defect, patent ductus arteriosus and mitral valve insufficiency.

The patient was a premature c-section child born at 37 weeks with birth weight of 1900g. Her past illnesses comprise common cold and she has undergone many surgeries due to her congenital heart disease. A visible scar is present on the anterior chest due to previous surgeries. Her weight is 24 kg and height are 131cm. Pulse rate and blood pressure is normal. The respiratory rate of the patient is 23 breaths per minute.

Auscultation of the heart shows rhythmic sounds with increased murmurs over the pulmonary artery area, systolic murmurs heard over the entire surface of the heart. Auscultation of lungs shows vesicular breath sounds without any wheezing. The patient's full blood report and biochemical analysis is normal. Echocardiography indicates that she has pulmonary artery stenosis, left atrial insufficiency, and mitral valve insufficiency of the 2nd degree. There is thickening of the atrial septum after the closure of ASD. X-ray shows dilation of the right pulmonary vessels at the root of the lung, sclerotic changes in the right lung with lower lobe pneumonia.

In the first 6 months of life, a Blalock-Taussig shunt was done, this creates a pathway for blood to reach the lungs. The reimplantation surgery of the left pulmonary artery was done along with the BT shunt. The pulmonary circulation of the patient was restored. Two years later, a modified BT shunt and stenting of the pulmonary trunk was done to prevent stenosis.

Three years after birth surgical correction of the DORV and complete atrioventricular communication with the removal of the pulmonary artery stent was done. The right ventricle outflow tract was constructed through plastic surgery. Current treatment plan includes Asprin, Clopidogrel, Molsidomine, Metoprolol, Atorvastatin and Lanzoprazole.

This patient had a Blalock-Taussig shunt which is a connection made between the right subclavian artery and the right pulmonary artery. Some of the blood flowing through the aorta towards the body will shunt through this connection and flow into the pulmonary artery to receive oxygen. This was intended for the correction of pulmonary stenosis and the pulmonary trunk hypoplasia. The reimplantation surgery of the left pulmonary artery done along with the BT shunt helps to restore the pulmonary circulation. Stenting of the pulmonary trunk was done to prevent pulmonary artery stenosis. Complete atrioventricular correction is necessary to normalize the outflow tract of the right ventricle.

The medical management of this patient is aimed at secondary prevention of cardiovascular events. Thromboprophylaxis is achieved through Asprin and Clopidogrel, blood pressure control – through Metoprolol and Molsidomine. Atorvastatin is given for lipid control.

Conclusion. Double Outlet Right Ventricle is a rare form of congenital heart disease with high complexity. Surgical intervention of the anatomical defects should be done early in life to prevent mortality and regular follow-ups are necessary to prevent morbidity and development of complications.

TOTAL VASCULAR ISOLATION IN SEGMENTAL LIVER RESECTION FOR ECHINOCOCCAL CYST

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Introduction. Echinococcal disease is widespread in many countries of the world. According to some estimates, more than 1 million people in the world are currently affected by echinococcosis, and the incidence in some endemic and non-endemic regions varies more than 200 times. In the last decade, there has been an increase in the incidence of echinococcosis and the expansion of the geographical boundaries of the disease.

Aim of the study. To improve the results of surgical treatment of patients with echinococcal liver cysts.

Materials and methods. The article presents the results of surgical treatment of two patients who underwent segmental resections of the liver for echinococcosis using the technique of total vascular isolation. Patients were admitted to the Department of Surgical Pancreatology, Hepatology and Transplantation of Grodno Regional Clinical Hospital, Belarus with complaints of heaviness and aching pain in the right upper quadrant of the abdomen. Both patients underwent a complex of laboratory and instrumental research methods, including MRI, CT and ultrasound of the abdominal and retroperitoneal organs. According to MRI, both patients in the S7 segment of the liver subcapsularly revealed rounded focal formations with clear contours of 50*33 mm and respectively 45*30 mm, with the presence along the posterior wall of a hyperdense component with clear contours of 5 * 6 mm. The fact of the close location of liquid formations to the right hepatic vein in both cases has been established.

Patients underwent segmental resection of the liver for an echinococcal cyst using the method of total vascular isolation. In both cases, a laparotomy was performed with a J-shaped approach in the right upper quadrant of the abdomen. To carry out total vascular isolation of the liver, the inferior vena cava in the supra- and subhepatic sections, as well as the hepatoduodenal ligament were mobilized using a thread-Pringle maneuver. During the

mobilization of one of the veins, one patient was found to have a linear traction defect in the wall of the inferior vena cava. Thanks to the use of total vascular isolation, intraoperative blood loss was avoided at this stage. The place of "linear traction" was stitched with a vascular suture over the vascular clamp of Satinsky. Liver parenchyma transsection was performed using ligasure triad apparatus, bipolar and monopolar coagulation, as well as using precision stitching of visualized vascular and biliary structures. Resections of the 7th segment of the liver with the above-described formations were performed step by step.

Results and discussion. The duration of the operation in both cases was about 6 hours. Intraoperative blood loss averaged about 400 ml. Both patients were discharged from the surgical hospital in a satisfactory condition for 10 and 15 days respectively in the postoperative period. During the pathohistological examination of macropreparation, the diagnosis of echinococcal cyst was confirmed in both cases. There were no relapses of the disease, as well as repeated admissions to the hospital within a follow-up period of up to 1.5 years.

Conclusion. The use of the method of total vascular isolation allows to reduce significantly intraoperative blood loss, and also makes it possible to avoid extensive resections in echinococcal liver cysts.

CLINICAL AND LABORATORY FEATURES IN PATIENTS WITH DIFFERENT PHENOTYPES OF HEART FAILURE

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Introduction. The 2016 European Society of Cardiology guidelines have introduced a new classification of heart failure (HF) based on the left ventricular ejection fraction (LVEF), which classifies patients into HF with preserved ejection fraction (LVEF – 50%), HF with reduced ejection fraction (HFrEF) (LVEF <40%), and HF with mid-range ejection fraction (HFmrEF) (LVEF 40-49%). Previous clinical trials that targeted the outcome of different strategies in HFrEF usually included patients with LVEF lower than 35-40%, which makes our study relevant.

Aim of the study. To evaluate clinical and laboratory differences in patients with HF with reduced and mid-range LVEF.

Materials and methods. The study included 80 patients with HF and LVEF <50% who were admitted to the Grodno State Cardiological Center for treatment from January to November 2024. Group 1 included 45 patients with HFrEF, while Group 2 included 35 patients with HFmrEF. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients with HFrEF and HFmrEF were predominantly male (29 (64%) vs 25 (71%), p>0.05), comparable in age,

prevalence of obesity, prior myocardial infarction and diabetes mellitus (p>0.05). Patients with HFmrEF more often had hypertension (33 (73%) vs 32 (91%), p=0.04) than patients with HFpEF. In both groups there was rather high number of patients with stable angina (20 (44%) vs 14 (40%), p>0.05), but patients with HFrEF more often had CCS class 3 (10 (22%) vs 1 (3%), p=0.01). Also, patients with HFrEF were characterized by higher class of HF (NYHA Class IV in 13 (28%) vs 1 (3%), p<0.001), while in HFmrEF patients NYHA class II was more common (15 (43%) vs 4 (9%), p<0.001).

Laboratory markers of patients in both groups had no significant differences except for urea (8.1 [6.2; 9.1] vs 6.9 [5.5; 7.7] mmol/L, p=0.026) and NTproBNP level (6155 [1549; 6256] vs 2495 [1716; 2661] pg/mL, p=0.031), which were significantly higher in patients with HFrEF. It's interesting to note that creatinine and estimated GFR levels were comparable (p>0.05).

Conclusion. Patients with HFrEF had higher class of stable angina and HF NYHA class (p<0.01), however patients with HFmrEF more often suffered from hypertension (p<0.05). Reliability of the obtained results should be further checked on larger samples of patients.

DELAYED RE-EMERGENCE OF MYCOPLASMA PNEUMONIAE AFTER COVID-19 PANDEMIC

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Introduction. After a three-year decline during the COVID-19 pandemic, *Mycoplasma pneum*oniae infections re-emerged on a global scale in 2023-2024. This case series examines the incidence and severity of *M. pneumoniae* infections among children and adolescents in the post-pandemic period. Furthermore, it explored the variations of biomarkers in *M. pneumoniae* infections observed in pediatric and elderly populations following the COVID-19 period.

Aim of the study. The primary objective of this retrospective case series is to determine a clear association between biomarkers *Mycoplasma pneumoniae* to further improve and support the current literature in this field of infectious diseases and to study the impact of the COVID-19 pandemic on the prevalence of M. pneumoniae.

Materials and methods. This retrospective case series included 105 patients hospitalized in Grodno Regional Infectious Disease Hospital with a positive *M. pneumoniae* DNA (PCR) and a positive IgM (ELISA) from September 17, 2024 to December 31, 2024. Statistical processing of the material was carried out using the StatTech v. 4.7.2 software package, Russia, using nonparametric methods and Exel.

Results and discussion. For this case series 87 (82,9%) out of 105 patients were children and 18 (17,1%) were adults; this showed a shift to pediatric

population. Furthermore, 92 (87,6%) patients out of 105 were presented with pneumonia; which subdivided into 86 (81,9%) as unilateral and 6 (5,7%) as bilateral localization, 7 (6,7%) were presented with bronchitis as the primary complain and 5 (4,7%) were presented with upper tract respiratory infection. The demographic division of patient population into city 91(86,7%) and village 14 (13,3%). Co-infections were prominent with 23 (21,9%) out of 105 patients.

It was revealed that during assessment with the application of Mann-Whitney U test for the following parameters such as CRP depending on pneumonia and fever (p = 0,045). Pneumonia without fever was predicted at a CRP value below 21,8 (Youden index) by ROC curve (AUC = 0.663; 95% CI: 0.526-0.799, p = 0,045). The sensitivity and specificity of the resulting prognostic model were 93,3% and 37,1%, respectively.

The correlation was established between PLR (platelets/lymphocyte ratio) and CRP/eosinophils (p=0,009), PLR (platelets/lymphocyte ratio) and NLR (neutrophils/lymphocyte ratio) (p<0,001), the analysis of the NMR (absolute neutrophils/absolute monocytes ratio) depending on pneumonia & fever (p = 0,046), the MER (absolute monocytes/absolute eosinophils ratio) depending on pneumonia & fever (p = 0,034), CRP/platelets depending on fever type (p=0,004), CRP/ absolute monocytes depending on fever type (p = 0,006). Furthermore, with the application of Student's t-test for assessment of $WBCx10^9$ depending on pneumonia & cough, it was revealed to be highly statistically significant (p = 0,001).

Conclusion. An epidemiological shift to pediatric population was observed. It shows a higher correlation between biomarkers such as absolute lymphocytes, WBCs, absolute eosinophils, absolute platelets and absolute monocytes was observed. Presence of co-infection is considered as the variation of immune system caused by *M. pneumonia* after the COVID-19 pandemic.

MULTIDISCIPLINARY APPROACH TO END-STAGE POLYCYSTIC KIDNEY DISEASE: A CASE OF BILATERAL NEPHRECTOMY AND TRANSPLANTATION

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Introduction. Polycystic Kidney Disease (PKD) is a genetic disorder characterized by the formation of fluid-filled cysts in the kidneys, leading to progressive renal impairment and complications such as hypertension, hematuria, and end-stage renal disease (ESRD). Autosomal Dominant Polycystic Kidney Disease (ADPKD) is the more prevalent form, accounting for approximately 85% of cases and is caused by mutations in the PKD1 and PKD2 genes. Despite advances in supportive care, many patients eventually require renal replacement therapy, including dialysis and kidney transplantation. This

case study highlights the management and outcomes of a patient with PKD undergoing bilateral nephrectomy followed by a successful kidney transplant.

Aim of the study. To illustrate the clinical management of advanced PKD, highlighting the roles of bilateral nephrectomy and kidney transplantation in improving patient outcomes.

Materials and methods. A 60-year-old female diagnosed with PKD and liver cysts in 2004 presented in 2019 with flank pain, hypertension, fatigue, polyuria, and polydipsia. Her renal function progressively declined, with creatinine rising to 869 μmol/L and urea to 50 mmol/L by 2022. Hemoglobin dropped to 99 g/L. MRI showed extensive cystic involvement in both kidneys and liver. Hemodialysis was initiated in June 2022. To prepare for transplantation, she underwent a right nephrectomy in June 2023 and a left nephrectomy in September 2023. A cadaveric kidney transplant was performed in October 2023. Post-transplant care included immunosuppressants (mycophenolate mofetil, cyclosporine), antifungal/antibiotic prophylaxis (nystatin, co-trimoxazole, valganciclovir), and antihypertensive management.

Results and discussion. Post-transplant, creatinine decreased to 83 μmol/L and urea to 8.5 mmol/L. Hemoglobin and red blood cell counts stabilized, improving the patient's energy and reducing PKD-related symptoms. PKD is the leading genetic cause of ESRD, with bilateral nephrectomy and transplantation being the most effective treatments, as drugs like tolvaptan only slow cyst growth without curing the disease. This case emphasizes the importance of multidisciplinary care, involving nephrologists, transplant surgeons, and internal medicine specialists. Post-transplant management, including immunosuppression, infection control, and lifestyle modifications, is vital for long-term success.

Conclusion. This case highlights the complexities in managing advanced PKD, emphasizing the necessity for bilateral nephrectomy and timely kidney transplantation in ESRD patients. Post-transplant care, including immunosuppressive therapy and lifestyle modifications, plays a critical role in maintaining graft health and preventing complications. The patient's successful recovery post-transplant demonstrates the effectiveness of a multidisciplinary approach in managing PKD-related ESRD.

ABNORMAL ANATOMICAL VARIANT OF RENAL VEIN

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Introduction. Circumaortic left renal vein (CLRV) is an anomaly of left renal vein when an accessory left renal vein passes posterior to the aorta, along with normal renal vein passing anterior to the aorta. According to the previous

studies, the prevalence of circumaortic left renal vein has been reported to be between the range of 1% to over 15%. Mostly, it remains clinically silent until it gets discovered accidentally during an operation or imaging. In most cases of circumaortic left renal vein, compression of the the pre-aortic left renal vein between the superior mesenteric artery and the aorta occurs, which is termed as the nutcracker phenomenon. In addition, left renal vein fenestrations are seen rarely since vascular fenestrations are mostly seen in the arterial system and cerebral vessels.

Aim of the study. The article aims to highlight a rare case of an anomaly of left renal vein (circumaortic left renal vein with a fenestration associated with nutcracker phenomenon) and the importance of being familiar with such congenital anomalies as a possible cause for symptoms such as hematuria.

Materials and methods. We present to you, a case of circumaortic left renal vein with a renal vein fenestration, along with anterior nutcracker phenomenon which lead to macroscopic hematuria as a complication of the anomaly.

Results and discussion. A 31-year-old female presented herself for a consultation to the Department of Nephrology with complaints of macroscopic hematuria. She noticed her urine being in dark brown color 5 times within the past 1 year. She first consulted a urologist who initially diagnosed her with acute cystitis, after finding increased erythrocytes in her urine analysis. The Urologist assumed that it could be due to an infection she had and gave antibiotic therapy. However, the treatment did not improve her symptom. Hence, she visited the department of Nephrology to do further tests and get treatment. The patient demonstrated normal, painless urine output with sufficient diuresis and absence of edema. Urine analysis according to Nechiporenko revealed normal findings. Biochemical blood tests showed increase in creatinine level (107 mcmol/L) and GFR (60 ml/min/1,73m^2). Kidney Ureter Bladder (KUB) ultrasound showed normal findings. Finally, a Computed Tomography (CT) scan of abdominal organs was performed with intravenous contrast, which revealed circumaortic left renal vein with aorto-mesenteric compression by the superior renal vein (Nutcracker phenomenon), with fenestrated inferior renal vein. The patient was advised to be under observation of a physician, to be in compliance with correct water-salt regime, to avoid environments with cold temperature and strenuous physical activity. Before being discharged, the patient was advised to do ultrasound once in every 6 months.

Conclusion. In case of clinical symptoms such as hematuria, it is important to consider venous variations such as circumaortic left renal vein and have a high index of suspicion for it, to increase its detectability and to prevent possible iatrogenic injury during surgical procedures and interventions.

INTRAOPERATIVE DIAGNOSIS OF MIRIZZI SYNDROME

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Introduction. Mirizzi syndrome is a seldom seen illness marked by blockage of the common bile duct or common hepatic duct due to external compression from many impacted gallstones or a single massive impacted gallstone in Hartman's pouch. Incidence increases to 0.3-5% in individuals receiving cholecystectomy between the fourth and seventh decade of life

Aim of the study. This article hopes to bring more awareness and understanding about the Mirizzi syndrome. Also, this study aims to discuss the surgical interventions used to treat the Mirizzi syndrome.

Materials and methods. We are presenting 2 groups of patients who received cholecystectomy in 2013 and 2016. Out of the total amount of patients who received cholecystectomy, Mirizzi syndrome was diagnosed in 18 patients in 2013 and 2 patients in 2016.

Results and discussion. All patients had laparotomy, hepaticojejunal anastomosis due to total destruction of the hepaticocholedochus walls. However, one patient developed a purulent inflammatory condition and required plastic surgery. None had fatal complications.

The conventional treatment for Mirizzi syndrome is surgical intervention, specifically cholecystectomy. ERCP can serve as a temporary therapy for individuals with cholangitis while waiting for surgical intervention. Patients with PCMS who have already had cholecystectomy typically receive treatment by endoscopic intervention.

Conclusion. Mirizzi syndrome is a rare condition that is easily ignored. Early treatment can prevent serious consequences such as cholecystodochal fistulas, acute cholangitis, and severe sepsis.

CLINICAL AND ECHOCARDIOGRAPHIC FEATURES OF PATIENTS WITH SINGLE-CHAMBER AND DUAL-CHAMBER PACEMAKERS

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Introduction. Cardiac pacing is the established treatment for high-grade atrioventricular (AV) block, but the appropriate pacing mode remains the subject of debate. Single-chamber ventricular pacing prevents bradycardia and

death from ventricular standstill, but dual-chamber pacing better emulates normal cardiac physiology by restoring AV synchrony and matching the ventricular pacing rate to the sinus rate. As a result, dual-chamber pacing, as compared with single-chamber ventricular pacing, improves hemodynamic function, but the clinical benefit is uncertain.

Aim of the study. To identify clinical and echocardiographic features of patients with single-chamber and dual-chamber pacemakers.

Materials and methods. The study included 63 patients who were admitted to the Grodno State Cardiological Center for pacemaker implantation from January 2024 to March 2024. Group 1 included 30 patients with single-chamber pacemakers, while Group 2 included 33 patients with dual-chamber pacemakers.

Exclusion criteria from the study were: STEMI, chronic rheumatic heart disease, acute myocarditis, valvular pathology of the heart requiring surgical correction, prosthetic heart valves, oncological diseases and severe concomitant extracardiacpathology.

All patients underwent clinical, laboratory, and instrumental studies, including transthoracic echocardiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients of both groups were comparable in age and gender ($p>0.05$), with slight predominance of female gender. There were no significant intergroup differences in the prevalence of such co-morbidities as hypertension (93% vs 100%, $p>0.05$), obesity (40% vs 48%, $p>0.05$), anemia (13% vs 12%, $p>0.05$) and diabetes mellitus (13% vs 18%, $p>0.05$). Patients of Group 1 had atrial fibrillation more often in comparison with Group 2 (80% vs 52%, $p=0.02$). On the other hand, patients of Group 2 had higher prevalence of sick sinus syndrome (52% vs 0%, $p<0.001$) and AV-block 2 degree (30% vs 0%, $p<0.001$) in comparison with Group 1. Patients of both groups had no difference in prevalence of AV-block 3degree (30% vs 15%, $p>0.05$), syncope (23% vs 18%, $p>0.05$) and presyncope (60% vs 58%, $p>0.05$).

According to the results of transthorasicechocardiography, patients of Group 1 had significantly higher left atrial diameter (44 [42; 47] mm vs 41 [39; 43] mm, $p=0.002$) and right atrialdiameter (44 [40; 47] mm vs 38 [36; 40] mm, $p<0.001$) than patients of Group 2.

Patients of Group 1 showed a significant increase in left ventricle (LV) end-diastolic volume ($p=0.03$) but their LV ejection fraction (LVEF) values were comparable (60 [57; 65] vs 61 [58; 64] %, $p>0.05$). Patients of both groups didn’t have differences in values of diameter of the right ventricle (27 [25; 30] mm vs 26 [24; 28], $p>0.05$), but pulmonary artery systolic pressure was higher in patients of Group 2 (40[36; 47] mmHg vs 29 [25; 34] mmHg, $p<0.001$).

No significant differences were found in other echocardiographic parameters.

Conclusion. Patients receiving single-chamber pacemakers are more likely to suffer from permanent AF and have larger sizes of atria as well as higher pulmonary artery systolic pressure. Reliability of the obtained results should be further checked on larger samples of patients.

PAROXYSMAL VS PERSISTENT ATRIAL FIBRILLATION: CLINICAL AND ECHOCARDIOGRAPHIC DIFFERENCES

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Introduction. Atrial fibrillation (AF) is a multifaceted arrhythmia characterized by aberration of atrial electrical activity, culminating ineffective atrial contraction & irregularly irregular ventricular response. It intricately links to a spectrum of pathophysiological underpinnings including atrial structure and electrical remodeling, neurohumoral dysregulation, genetic susceptibility etc. AF is classified into subtypes including paroxysmal form where the spontaneous reversion of sinus rhythm typically within 7 days and persistent form which lasts longer than 7 days which necessitates therapeutic intervention in restoring sinus rhythm. Currently, it is a major healthcare issue prevalent in general practice, which makes our research relevant.

Aim of the study. To establish clinical and echocardiographic differences of patients with paroxysmal and persistent form of AF.

Materials and methods. The study included 84 patients, who were admitted to the Grodno State Cardiological Center for treatment from May 2024 to January 2025. Group 1 included 39 patients with paroxysmal AF while Group 2 included 45 patients with persistent AF. Exclusion criteria of the study was: STEMI, chronic rheumatic heart disease, acute myocarditis, valvular pathology of the heart requiring surgical correction, prosthetic heart valves, oncological diseases and severe concomitant extracardiac pathology. All patients underwent clinical, laboratory, and instrumental studies including transthoracic echocardiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients with paroxysmal AF were older than patients with persistent AF (71 [64; 76] vs 62 [56; 67] years, p=0.02). Patients of Group 1 were predominantly female (male gender only 36%), while in Group2 male patients were the majority 69%, p=0.01). Patients with persistent AF had significantly higher body mass index (33.4 [28; 36] vs 28.7 [24; 30] kg/m2, p=0.002) and more often had obesity (46.6% vs 20%. p=0.009) than patients with paroxysmal AF. Patients of both groups had no differences in prevalence of hypertension (100% vs 95%, p>0.05) and diabetes mellitus (25% vs 31%, p>0.05).

According to the results of transthoracic echocardiography, patients with persistent AF had significantly higher left atrial diameter (43 [41; 45] mm vs 39.7 [37; 43] mm, p=0.003) and right atrial diameter (40.8 [38; 43] mm vs 37.2 [34; 39.5] mm, p=0.007) than patients with paroxysmal AF.

Also, patients of Group 2 showed a significant increase in the volumetric dimensions of the left ventricle (LV) (LV end-diastolic volume (p=0.01) and LV

end-systolic volume (p=0.004) and decrease in LVEF (57 [54; 63] vs 64 [61; 69]%, p=0.003) in comparison with Group 1.

It's interesting that patients of both groups didn't have differences in values of diameter of the right ventricle (27.3 [25; 30] mm 26.4 [24; 28] vs p>0.05), but pulmonary artery systolic pressure was higher in patients of Group 2 (40.7 [37; 42] mmHg vs 32.3 [28; 35] mmHg, p<0.001).

Conclusion. Patients with persistent form of AF were predominantly male and had significantly higher body mass index. According to the results of echocardiography, patients with persistent form of AF had larger sizes of atria and volumes of LV as well as lower LVEF, which is associated with the formation of LV systolic dysfunction. A possible connection between the obtained results and future adverse outcomes of AF progression requires further studies.

EVALUATING TREATMENT APPROACHES IN MIRIZZI SYNDROME

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Introduction. Mirizzi syndrome is a rare but serious complication of gallstone disease, which causes the compression of the common hepatic duct, potentially leads to strictures or Cholecystobilliary fistulas. The results show that incidence of MS has increased due to rising prevalence of gallstone disease and also due to delay in surgical intervention. It occurs in 1-5% of patients post cholecystectomy, with having a mortality rate of 11-14%. Preoperative diagnosis is often missed in this case but with only 12-22% correctly identified.

Aim of the study. Analysis of the results of treatment of patients with Mirizzi Syndrome.

Materials and methods. We present our clinical observation. The patient, a 66-year-old woman, was admitted to the surgical department of GRCH with a diagnosis of "Gallstone disease: chronic calculous cholecystitis, choledocholithiasis" for further examination and surgical treatment. She complained of periodic dull pain in the right hypochondrium, nausea, and bitterness in the mouth. From her medical history, she had been suffering from gallstone disease for a long time. A week prior to admission, she developed jaundice and was treated in a surgical hospital at her place of residence. Ultrasound examination revealed The gallbladder: wrinkled, with a 15 mm calculus in its projection; intrahepatic ducts are not dilated.", magnetic resonance imaging MRI was performed. The liver appeared normal in shape and size, without focal pathology. Intrahepatic bile ducts were not dilated, and the gallbladder was reduced in size and sclerosed, containing an irregularly shaped calculus measuring up to 15.5 x 11 mm. This calculus was prolapsing into the

common bile duct above the junction with the cystic duct. The common bile duct was not dilated, measuring 3.3 mm in diameter, with no visible additional formations in its lumen. The pancreas was normally positioned, with well-defined irregular contours and no focal pathology: head measuring 23 mm; body 18 mm; tail 16.7 mm. The Pancreatic duct was not dilated, and the peripancreatic tissue was normal.

Results and discussion. A decision was made to initiate surgical intervention with laparoscopy to clarify the diagnosis. During the operation, it was found that the gallbladder was fibrotically altered, measuring 7x3x2.5 cm, and was firmly adhered at the fundus to the duodenum. A 1.5 cm diameter calculus was palpated at the neck of the gallbladder. Additionally, intimate adherence of the neck of the gallbladder to the right semi circumference of the common hepatic duct was noted. The intraoperative diagnosis was "Cholelithiasis: chronic calculous cholecystitis. Sclerotic (Wrinkled) gallbladder. Mirizzi syndrome type I."

After laparotomy, the gallbladder was separated from its firm adhesion to the duodenum. A stone was found in the neck of the gallbladder, with a developing ulcer between Hartmann's pouch and the common hepatic duct. Upon separating the neck of the gallbladder from the hepatic duct, an ulcer defect of more than 2/3 of the circumference of the hepatic duct was observed, with a 1.5 x 1 cm calculus prolapsing into it. The diameter of the common hepatic duct and the common bile duct located below the ulcer was 0.5 cm. The right and left lobar ducts were cannulated with Dollinger probes and found to be patent, without calculi. Given the established condition, a hepaticojejunostomy was done on a Roux-en-Y loop using separate sutures of a monofilament, long-absorbing suture material (5.0), using microsurgical instruments. The presence of Mirizzi syndrome in this case was inferred from the results of ultrasound and MRI and was confirmed during laparoscopy. This clinical case illustrates the potential for non-invasive preoperative diagnosis of Mirizzi syndrome. If necessary, additional techniques such as magnetic resonance cholangiography, retrograde cholangiopancreatography, intraoperative cholangiography, and cholangioscopy may be used.

Conclusion. 1. Visualization of the "wrinkled gallbladder" with an enlarged proximal part of the d. hepaticocholedohus allows one to suspect Mirizzi syndrome when performing an ultrasound, magnetic resonance imaging helps to clarify the diagnosis before surgery. If necessary, perform magnetic resonance cholangiopancreatography, retrograde cholangiopancreatography, cholangioscopy, intraoperative cholangiography. 2. Roux-en-Y hepaticojejunostomy is one of the acceptable operations that allow to achieve a favorable result in the surgical treatment of Mirizzi syndrome. 3. Timely diagnosis of Mirizzi syndrome can prevent intraoperative iatrogenic lesions of the bile ducts.

PACEMAKER DYSFUNCTIONS AND THEIR IMPACT ON PATIENTS WITH CONGENITAL HEART CONDITION

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Introduction. Ebstein Anomaly (EA) is a rare congenital heart defect with tricuspid valve malformation, affecting about 1 in 200,000 live births. It can lead to complications like arrhythmias and heart failure, presenting as cyanosis in neonates and exercise intolerance in older patients. Diagnosis typically uses advanced imaging, such as echocardiography and cardiac MRI. Management often requires surgical interventions, including valve repair or replacement, especially in adults. Pacemaker implantation is essential but poses challenges due to the altered right heart anatomy, increasing risks of dysfunction and complications. A multidisciplinary approach is crucial for optimal care.

Aim of the study. Highlighting the complexities of managing a patient with Ebstein Anomaly, focusing on the challenges of multiple cardiac interventions and device implantation.

Materials and methods. This case report details the clinical management of a 33-year-old female patient with Ebstein Anomaly, focusing on the diagnostic and therapeutic strategies utilized. The patient, with a history of multiple cardiac interventions and mechanical tricuspid valve prosthesis, presented with sharp Electric shock-like epigastric pain, shortness of breath, weakness, and heavy menstrual bleeding. She underwent a single-chamber pacemaker implantation in 2007 and transitioned to a dual-chamber pacemaker in April 2024, with regular checks for electrode functionality. Imaging, including X-rays and echocardiography, confirmed atrial electrode dislocation and assessed cardiac function. Laboratory tests monitored inflammatory markers and renal function. A multidisciplinary team developed a tailored management plan, adjusting warfarin therapy and initiating low molecular weight heparin (LMWH) to balance thrombotic and bleeding risks. Postoperative care included close monitoring, pain management, and antibiotic therapy (teicoplanin) alongside anti-inflammatory medication (colchicine) for suspected infections and pleural effusion. A structured follow-up protocol ensured regular visits and INR monitoring to prevent complications.

Results and discussion. A 33-year-old female with Ebstein Anomaly presented to Grodno State Clinical Cardiology Center with sharp Electric shock-like epigastric pain, shortness of breath, weakness, and heavy menstrual bleeding. Her cardiac history included multiple interventions: biological tricuspid valve prosthesis in 2001, mechanical St. Jude prosthesis in 2006, and a single-chamber pacemaker in 2007 for AV block. She had a pacemaker re-implantation in 2013 and experienced atrial flutter, treated with cardioversion in 2020 and 2022 following COVID-19.

In April 2024, she was admitted for dual-chamber pacemaker re-implantation. Although symptoms improved initially, she experienced recurrent pain in September 2024, leading to the discovery of atrial electrode dislocation. Investigative tests revealed grade 2-3 tricuspid regurgitation and dilation of the right ventricle. Due to high thrombotic risk, atrial electrode re-implantation was successfully performed on September 19, 2024.

Postoperatively, mild pain and fever were noted, prompting antibiotic therapy for suspected infection. By September 26, her condition improved. Upon discharge, she received follow-up recommendations, including regular cardiology visits and ongoing management with warfarin and colchicine, ensuring structured care for her complex condition.

Conclusion. This case report highlights the complexities of managing a patient with Ebstein Anomaly and multiple cardiac interventions. The experience of atrial electrode dislodgment underscores the necessity for vigilant monitoring and timely interventions to address complications related to mechanical heart valves and pacemaker systems. It emphasizes the importance of a multidisciplinary approach to optimize patient outcomes, particularly in managing anticoagulation and thromboembolic risks. Future research should focus on establishing standardized protocols for monitoring pacemaker electrodes and improving fixation techniques to enhance device stability and care for patients with complex cardiac histories.

ANALYSIS OF ASSESSMENT OF PHYSICAL DEVELOPMENT IN CHILDREN WITH CHRONIC GASTRITIS

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Introduction. Gastritis is an inflammation of the mucous membrane of the stomach that can appear in acute, chronic, or particular forms and is characterized by mucous lining atrophy, disorders of physiological regeneration, and secretory insufficiency. To obtain a final diagnosis of chronic gastritis, histopathological evidence of abnormal mucous membrane of the stomach due to inflammation is essential, while endoscopy and radiology can be used for further investigations.

Usually, in the assessment of the growth of a child, the child's weight, height, and length are compared according to the growth standard. A child’s actual size and his/her rate of growth are influenced by genetic and exogenous factors. Previous and current diseases can be included in these criteria of exogenous factors that affect physical development.

Aim of the study. To assess the correlation between physical development and chronic gastritis in children.

Materials and methods. Physical development of 100 children with

chronic gastritis was analyzed. The children were diagnosed and treated for chronic gastritis in the gastroenterology department of the Regional Children's Clinical hospital, Grodno in 2023. Analysis was performed using WHO Anthro II version 3.2.2 and WHO AnthroPlus version 1.0.4. This study uses software to calculate the indicators, height for age and BMI for age in analyzing the physical development of children with chronic gastritis. Microsoft Excel software was used in data distribution and analysis.

Results and discussion. From the hundred case reports, it was observed that the majority of patients were female, which is 76%. The percentage of male children with chronic gastritis was 24%. According to the age of the children treated, it was identified that children from 7 to 17 were present. The average age of all the children treated is 13 years. And the average weight, height, and BMI of this group of children are 54.89kg, 163.25cm and 20.2kg/m2 respectively. 11% of the children were under the age category of elementary school. 30% were from middle school. 59% were under the age category of high school.

According to the z-scores obtained from the Anthro software for each child, the height-of-age and BMI-for-age of these children were analyzed. When considering the results of height for age, 43% of children got σ± (0.0-0.9) SD (Standard Deviation), 40% got ± (1.0-1.9) SD, 16% σ ± (2.0-2.9) SD and 1% σ ± (3.0-3.9) SD. Hence, 43% of the children have normal values of height according to their age, while 57% are not in the standard range of height for their age. Out of the 57% of children who had deviations in height-for-age, 42% were girls and 15% were boys. 9% of boys and 34% of girls were in the normal height range.

Furthermore, the results of BMI for the age of these children are as follows; 57% of σ ± (0.0-0.9) SD, 34% of σ ± (1.0-1.9) SD and 9% of σ ± (2.0-2.9) SD. With that consideration, 57% is in the normal BMI-for-age. 43% have deviated values for BMI for their age. Out of the 43% of children who have deviations for BMI-for-age, 32% are girls and 11% are boys. 13% of boys and 44% of girls are in the normal BMI-for-age range. Out of the children who do not have median z-scores in BMI-for-age, 60% are overweight, and 40% are underweight.

Using the Anthro software, a graphical representation of this set of children's height-for-age compared with WHO growth standards was obtained. It was observed that there is a right shift of the curve representing these 100 children, from the WHO growth standard curve is centered around z-score 0. This suggests that the sample children are, on average, taller compared to the WHO standard reference population.

The results of the graphical representation from the Anthro software describing BMI-for-age is as follows. The curve of the sample data of this distribution is shifted slightly to the left of the WHO standard curve. This indicated that these 100 children, on average, have lower z-scores than the WHO standard BMI-for-age. Hence, it can be interpreted that the sample set of children, on average, has lower BMI values compared to the WHO standard reference population.

Conclusion. The majority (59%) of children with chronic gastritis are high school children.

The majority (57%) of the children were not in the normal range of height according to their age.

The majority (57%) of the children had normal BMI according to their respective ages.

Of the children with deviations of BMI (43%), the majority (60%) were in the overweight category.

DIFFERENCE IN CONCENTRATIONS OF OSTEOPROTEGERIN AND ENDOTHELIN-1 IN PATIENTS WITH COLORECTAL POLYPS DEPENDING ON THEIR SEX

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Introduction. Osteoprotegerin, (OPG) which is also termed as tumor necrosis factor receptor superfamily member 11B, is a protein which is involved in bone remodeling by decreasing osteoclast activity that primarily increase bone strength and density. OPG has affinity towards OPG ligand; thereby binding it prevents osteoclast development. OPG also has been a predictive biomarker for colorectal cancer where colorectal polyps are known to be the precancerous lesions of colorectal cancer.

Endothelin-1 (ET-1) produced by vascular endothelial cells, cardiomyocytes and tubular cells in kidney. It plays a major role in mediating vascular tone through vasoconstriction. ET-1proven to be involved in cancer development and progression through cell proliferation, reduction of apoptosis, invasion and tumor angiogenesis. Especially it promotes colorectal cancer by stimulating cancer cells growth and formation of tumor stroma by fibroblast.

Aim of the study. To examine Osteoprotegerin and Endothelin-1 levels in males and females with colorectal polyps

Materials and methods. A retrospective analysis of 17 case reports of patients admitted to the Grodno University Clinic for plan endoscopic polypectomy during the period of January to November 2024.

Descriptive statistic was presented as Me [Q1:Q3], where Me is the median, Q1, Q3 are the first and third quartiles respectively.

$P<0.05$- to test statistical hypothesis.

Results and discussion. According to the analytical data patients were 45-75 years old - 61 [55;64] years. Out of them 76% of the patients were males (13), while the rest 24% (4) were females.

OPG concentration in total group was 101.13 [87.373;178.135] pg/ml. We have analyzed the number of male and female patients based on their OPG concentration in picogram per milliliter in blood and assessed over three different concentration ranges as the concentration gradient is high. First concentration range varies from 40 to 100 pg/ml. There were 7 out of 17 males and no females. Second range varies from 100-200 pg/ml, where 4 of them are males and 3 of them are females. Third range varies from 200-350 pg/ml, where 2 of them are males and 1 is female.

ET-1 concentration in total group was 60.94 [44.105; 75.595] ng/l. We analyzed the distribution of male and female patients based on their ET-1 concentration levels in nanograms per liter in blood samples. The assessment was conducted across four distinct concentration ranges, considering the substantial concentration gradient. First concentration range varies from 30 to 40 ng/l. There were 3 out of 17 males and no females. Second range varies from 40 to 50 ng/l. There were 2 males and only 1 female. Third range varies from 50 to 70 ng/l and there were 4 males and 2 females. Fourth range varies from 70 to 90 ng/l and there were 4 males and only 1 female.

Conclusion. In our research we've found different OPG and ET-1 concentrations in males and females with colorectal cancer.

EVALUATION OF MICROROUGHNESS OF TOOTH ENAMEL SURFACE AFTER DEBONDING OF BRACKET

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Introduction. Debonding of the bracket system is the final stage of the orthodontic treatment. The main aim at that stage is removing of fixing composite from the enamel surface. There are a lot of methods of material removing, but there is no answer, which of those methods are most effective and safe to enamel.

Aim of the study. A comparative assessment of the efficiency of removing residual composite material for fixing brackets from the enamel surface was carried out using carbide finishers and diamond burs with red markings, as well as various polishing systems (single- and multi-stage systems, polishing rubbers and disks).

Materials and methods. A comparative assessment of the efficiency of removing residual composite material for fixing brackets from the enamel surface was carried out using carbide finishers and diamond burs with red markings, as well as various polishing systems (single- and multi-stage systems, polishing rubbers and disks). Determination of the microroughness of tooth enamel (n=60) was carried out using the contact profilometry method with

recording the values of R_a (the arithmetic mean deviation of the profile), R_z (the height of profile irregularities at ten points - 5 largest protrusions and deepening's), R_q (the standard deviation of the profile)

Results and discussion. These values were determined initially, after grinding and after polishing. It was found that in subgroups 1 and 2 of group 1 (diamond finishing bur + single-stage polishing system and diamond finishing bur + multi-stage polishing system) after polishing, a decrease in the arithmetic mean deviation of the profile, the height of profile irregularities at ten points and the mean square deviation of the profile was revealed. The initial values of the studied surface microroughness indices (R_a, R_q and R_z) did not differ from those after polishing in subgroup 3 of group 1 (diamond finishing bur + polishing discs) and in the subgroups of group 2 (a combination of carbide finishers with a single- and multi-stage polishing system, as well as with polishing discs).

Conclusion. The study revealed the most promising combinations of burs and polishers for removing residual composite material and adhesive system from the surface of tooth enamel. However, it needs to be continued in the direction of studying the mass of the samples initially and after grinding and polishing, which will allow us to establish whether the alignment of the profile is accompanied by removal of the surface layer of enamel. The data obtained as a result can serve as a basis for developing an algorithm for removing the remains of the fixing material at the stage of debonding the bracket system, which will become the object of our further research.

THE IMPACT OF EPONYMS ON MEDICAL TERMINOLOGY: STANDARDIZATION VS. LEGACY

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Introduction.

Eponyms, proper names used in medicine, have been common for centuries but are now debated for their effectiveness. While over 8,000 anatomical eponyms exist, opinions vary: some value them for honoring contributors and saving time, while others highlight ethical concerns and confusion.

Aim of the study.

- Assess the overall impact of eponyms on medical terminology.
- Determine if eponyms remain essential in medical language.
- Evaluate their role in preserving legacies amid Latin standardization.

Materials and methods.

The study examined various eponymic anatomical, histological and other medical terms from the International Anatomical Nomenclature (FIPAT). Eponyms were analyzed for their equivalents, categorization as replaceable or

irreplaceable, and arguments for discontinuation.

Results and discussion.

Supporters argue eponyms ensure brevity, consistency, and global recognition while honoring pioneers. However, critics highlight ambiguity, multiple meanings (e.g., Muller's muscle), and redundancy (e.g., the ileocecal valve with various names). Despite a decline in usage, peaking from 1969-1999 eponyms persist due to historical and practical value. Modern texts now feature both Latin and English terms, reflecting a shift while maintaining legacy.

Conclusion.

Eponyms have shaped medical terminology, offering both benefits and challenges. While institutions push for standardization, primarily through Latin, a balanced coexistence seems most practical, where eponyms continue in English alongside standardized Latin terminology.

IMPACT OF ATRIAL FIBRILLATION ON LABORATORY AND ECHOCARDIOGRAPHIC PARAMETERS IN PATIENTS WITH HYPERTENSION

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Introduction. Hypertension and atrial fibrillation (AF) are two important public health priorities. Their prevalence is increasing worldwide, and the two conditions often coexist in the same patient. Hypertension ultimately increases the risk of AF, and because of its high prevalence in the population, it accounts for more cases of AF than other risk factors. Among patients with established AF, hypertension is present in about 60% to 80% of individuals. Despite the well-known association between hypertension and AF, several pathogenetic mechanisms underlying the higher risk of AF in hypertensive patients are still incompletely known.

Aim of the study. To evaluate clinical, laboratory and electrocardiographic differences in patients with hypertension and AF in comparison with sinus rhythm.

Materials and methods. The study included 68 patients with hypertension who were admitted to the Grodno State Cardiological Center for treatment from September to December 2024. Group 1 included 42 (61.7%) patients with hypertension and paroxysmal or persistent form of AF while Group 2 included 26 (38.3%) patients with hypertension and sinus rhythm.

Exclusion criteria from the study were: acute myocardial infarction, unstable angina, valvular pathology of the heart requiring surgical correction, prosthetic heart valves, oncological diseases and severe concomitant extracardiac pathology. All patients underwent clinical, laboratory, and instrumental studies, including transthoracic echocardiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients with hypertension and sinus rhythm were younger than patients with AF (44 [38; 52] vs 48 [43; 54] years, p=0.03), however their gender structure was the same (male patients predominated, 84% vs 76%, p>0.05). Patients of both groups had no differences in their body mass index (31.3 [28.4; 34.1] vs 31.5 [27; 30.6] kg/m2, p>0.05) and around a half of patients in each group had obesity (57% vs 48%, p>0.05). Patients of both groups had no difference in prevalence of diabetes mellitus and anemia (p>0.05).

Laboratory parameters of patients didn't demonstrate any significant differences. According to the results of transthorasic echocardiography, patients with hypertension and AF had significantly higher left atrial diameter (41.0 [38; 44] mm vs 36.0 [34; 38] mm, p=0.001) than patients with sinus rhythm.

Also patients with AF showed a significant increase in left ventricle (LV) end-systolic volume (p=0.012) and decrease in LV ejection fraction (LVEF) values (60 [57; 65] vs 65 [63; 69] %, p=0.013). Patients of both groups didn't have differences in values of systolic diameter if interventricular septum (p=0.214) and LV posterior wall (p=0.052), however both diastolic diameters were higher in AF patients (p=0.047 for interventricular septum and p=0.038 for LV posterior wall).

No significant differences were found in other echocardiographic parameters.

Conclusion. Comparative analysis of echocardiographic characteristics showed that linear and volumetric characteristics of the left atrium and left ventricle of the patients with combination of hypertension and AF exceed similar parameters in patients with hypertension and sinus rhythm. A possible connection between the obtained results and future adverse outcomes of AF requires further study.

HEART FAILURE WITH REDUCED EJECTION FRACTION: DIFFERENCES BETWEEN ATRIAL FIBRILLATION AND SINUS RHYTHM

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Introduction. Atrial fibrillation (AF) is a common comorbidity in chronic heart failure (HF) patients, with a prevalence that has been reported from 10% up to 50-60%, depending on age and severity of HF. The majority of current data suggest that AF is associated with increased mortality in patients with HF and preserved ejection fraction and in those with reduced ejection fraction (HFrEF). By contrast, the HF long-term registry of the European Society of Cardiology showed that AF was not associated with poor outcomes in patients with HFrEF, which makes our research relevant.

Aim of the study. To evaluate clinical, laboratory and echocardiographic differences in patients with and without AF in HFrEF.

Materials and methods. The study included 91 patients with heart failure and LVEF less than 50% who were admitted to the Grodno State Cardiological Center for treatment from January to November 2024. Group 1 included 57 (63%) patients with HF and paroxysmal or persistent form of AF while Group 2 included 34(37%) patients with HF and sinus rhythm.

Exclusion criteria from the study were: acute myocardial infarction, unstable angina, valvular pathology of the heart requiring surgical correction, prosthetic heart valves, oncological diseases and severe concomitant extracardiac pathology. All patients underwent clinical, laboratory, and instrumental studies, including transthoracic echocardiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients with AF and sinus rhythm were comparable in age (62 [56; 69] vs 60 [55; 67] years, $p>0.05$) and gender (male patients 83% vs 91%, $p>0.05$). Patients with HFrEF and AF had significantly higher body mass index (31 [27; 35] vs 27 [25; 30] kg/m2, $p=0.005$) and more often had obesity (62% vs 26%. $p=0.001$) than patients with HFrEF and sinus rhythm. Patients of both groups had no difference in prevalence of hypertension (88% vs79%, $p>0.05$) and diabetes mellitus (29% vs 23%, $p>0.05$). It is interesting to say, that patients with HFrEF and sinus rhythm more often had stable angina (53% vs 34%, $p=0.03$) and more often suffered from myocardial infarction (44% vs 26%, $p=0.048$) than patients with HFrEF and AF.

Laboratory parameters of patients didn't demonstrate any significant differences, except for renal function tests. Patients with AF had significantly higher levels of urea ($p=0.007$), creatinine ($p=0,018$) and slightly lower eGFR ($p=0.06$).

According to the results of transthorasic echocardiography, patients with HFrEF and AF had significantly higher size of the left atrial diameter (47.2 [44; 51] mm vs 45.8 [41; 48] mm, $p=0.03$) and the right atrial diameter (44.4 [42; 46] mm vs 42.9 [39; 46] mm, $p=0.017$) than patients with sinus rhythm. However, patients didn't have differences in values of end-diastolic volume of the left ventricle ($p=0.548$), end-systolic volume of the left ventricle ($p=0.360$), and LVEF (40.7 [36; 47] % vs 38 [28; 48] %, $p=0.423$). Contractility index was higher in patients with sinus rhythm (1.72 [1.38; 2.13] vs 1.51 [1.19; 1.81], $p=0.032$).

Conclusion. Patients with HFrEF and sinus rhythm more often had ischemic origin of cardiomyopathy, while in patients with HFrEF and AF cardiomyopathy was of dilated or mixed origin, which is confirmed by differences in sizes of atria and contractility index.

GENDER DIFFERENCES IN PATIENTS WITH CHRONIC HEART FAILURE WITH REDUCED LEFT VENTRICULAR EJECTION FRACTION

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Introduction. This study investigates the gender differences in patients with heart failure and reduced left ventricular ejection fraction (HFrEF). Previous research has suggested that males and females may exhibit distinct clinical characteristics, responses to treatment and outcomes. Understanding these differences is crucial for tailoring effective management strategies and improving overall patient care in HFrEF.

Aim of the study. To evaluate clinical and echocardiographic differences in male and female patients with chronic HFrEF

Materials and methods. The study included 85 patients with HF with reduced LVEF (<50%). Group 1 included 45 (52.9%) male patients, while group 2 consisted of 40 (47.1%) female patients. The inclusion criteria were patients with HFrEF diagnosed based on ESC (2021) guidelines, age>18 years and agreement to participate in the study. All patients underwent a comprehensive clinical examination, as well as standard echocardiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Male patients with HFrEF were younger than females (65 [60; 73] vs 70 [66; 74] years, p=0.013). Patients of both groups were comparable in body mass index (30 [25; 33] vs 32 [27; 36], p=0.503), and almost a half of patients in each group had obesity (46.6% vs 47.5%, p=0,939). Also, patients of both groups were comparable in prevalence of coronary artery disease (38 (84.4%) vs 33 (82.5%), p=0.81), as well as hypertension (40 (88.9%) vs 31 (77.5%), p=0.258) and diabetes mellitus (9 (20%) vs 7 (17.5%), p=0.58). Female patients were more likely to have anemia (11 (27.5%) vs 4 (8.9%), p=0.025). Male and female patients with HFrEF had no significant differences in the size of left atrium (p=0.23), right atrium (p=0.47) and LVEF (38 [34; 45] vs 37 [32; 44] %, p=0,63), however, males had larger both end-diastolic (207 [174; 220] vs 191 [152; 209] mm, p=0.026) and end-systolic volume of left ventricle (130 [95; 152] vs 115 [68; 137] mm, p=0.027).

Conclusion. Female patients with HFrEF were older and more prone to anemia, while both groups demonstrated high percent of comorbidities such as obesity and diabetes. There were no significant intergroup differences in echocardiographic parameters, except for the volumes of left ventricle (p<0.05).

ANALYSIS OF KIDNEY TRANSPLANTATION RESULTS IN PATIENTS WITH CHRONIC RENAL DISEASE

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Introduction. Chronic kidney disease (CKD) is a global health challenge, with an increasing number of patients progressing to ESRD. Renal replacement therapies include hemodialysis, peritoneal dialysis, and kidney transplantation, with transplantation offering superior long-term outcomes. Despite advancements, challenges such as donor organ shortages, post-transplant immunosuppression, and surgical complications remain significant barriers.

A major contributing factor to CKD progression is the rise in metabolic disorders, including diabetes and hypertension, which are primary causes of ESRD worldwide. Studies indicate that early detection and management of CKD can significantly reduce the burden on healthcare systems and improve patient prognoses. However, once a patient reaches ESRD, kidney transplantation remains the gold standard for treatment, as it provides improved survival and quality of life compared to long-term dialysis

Aim of the study. The purpose of this study is to analyze kidney transplantation results, evaluate patient survival, and assess post-operative complications to determine best practices for improving transplantation success. We also aim to investigate trends in immunosuppressive therapy efficacy, donor-recipient compatibility factors, and innovations in surgical techniques to reduce post-operative morbidity.

Materials and methods. The GRCH opened a Transplantation Department in 2013, performing the first kidney transplant in Grodno Region. It later became part of the Department for Surgical Pancreatology, Hepatology, and Organ and Tissue Transplantation

Results and discussion. In the early postoperative period, complications occurred in 22 (13.5 %) patients, the postoperative mortality was 1.8% (3 patients). In the late postoperative period, the kidney explantation was performed in 4 (2.45%) patients, 6 patients died (3.7%) as a result of progressing comorbidities and complications (average at 15.6±9.8 months after transplantation). A 5-year predicted patient survival after heterotopic kidney transplantation calculated by using the Kaplan-Meier' method was 94.5%.

Conclusion. Kidney transplantation significantly improves the quality of life and survival rates in ESRD patients. Despite complications, the success rates are comparable to international standards. Optimizing perioperative care, long-term follow-up, and the development of novel therapeutic interventions can further enhance outcomes. The continued collaboration between nephrologists, transplant surgeons, and researchers is essential for advancing transplant medicine and ensuring better long-term patient prognoses.

COMPARATIVE ANALYSIS OF HEALTHCARE SYSTEMS IN RUSSIA AND INDIA

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Introduction. Healthcare systems worldwide employ diverse approaches to delivering medical services, with outpatient care playing a vital role in public health. India and Russia have developed distinct models, offering valuable insights into healthcare delivery complexities. This comparative analysis aims to examine India’s and Russia's outpatient care systems, highlighting strengths, weaknesses, and potential strategies for enhancement.

Aim of the study. To compare the organization of health care systems in both countries.

Materials and methods. The analysis is based on existing literature and data on the two countries' healthcare systems.

Results and discussion. India's healthcare system operates through a multi-tiered structure, offering multiple entry points, with stronger ratings in doctor-patient communication and treatment flexibility. It consists of primary, secondary, and tertiary levels, to serve its vast population across urban and rural areas. The system provides a range of services. While Russia's system is centralized, providing a single-point access. These facilities function under a structured territorial principle: patients register with their local polyclinic based on residential address and receive assignment to a specific district physician. Electronic health records maintain patient history and treatment plans. The referral system within polyclinics operates through a defined hierarchy. The process includes initial consultation with district physicians, specialist referrals within the same facility, and advanced care coordination with hospitals when necessary. Both countries face significant challenges, including urban-rural disparities, geographic disparities, and workforce management problems. Common challenges include resource allocation issues and financial constraints. The outpatient care systems in both countries face difficulties such as lack of resources, shortage of skilled medical personnel, and transportation issues

Conclusion. A comparative analysis highlights potential strategies for enhancing outpatient care. Cross-learning between systems can be beneficial, such as integrating Russia's comprehensive referral tracking system into India's healthcare network.

PREVALENCE OF OBESITY AND CHANGES IN LABORATORY PARAMETERS IN POSTMENOPAUSAL WOMEN WITH BREAST CANCER

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Introduction. Obesity is a risk factor (RF) for several major cancers, including breast cancer (BC) in postmenopausal women, as well as a separate independent RF for BC recurrence. Obesity is accompanied by insulin resistance, chronic inflammation, and adipokine secretion, which contribute to tumor progression, and overall survival is higher in women with BC with normal body weight.

Aim of the study. To assess the prevalence of obesity and changes in laboratory data in postmenopausal women with BC, depending on body mass index (BMI).

Materials and methods. The study involved 50 postmenopausal women with breast malignancies (ICD-10). These participants were divided into two groups based on their BMI: group 1 (n=27), with a BMI <30 kg/m², and group 2 (n=23) with a BMI >30 kg/m². Data analysis was made by using the 4D client program at the State Healthcare Institution "Grodno City Polyclinic No. 6". The following laboratory data and physical examination were analyzed: BMI, erythrocyte sedimentation rate (ESR), hemoglobin (Hb) levels, and glucose levels in blood plasma (BGL). We performed statistical analysis by using STATISTICA 10.0.

Results and discussion. The average age of the women with different stages of BC in our study was 66 [59; 69] years, and there were no differences in age between the groups (p>0,05). Only 20% of these studied women with BC (n=10) had a normal BMI of 22,6 kg/m², 34% of them (n=17) were overweight, and 46% (n=23) were obese. In the first group, the statistically average BMI was 26,4 [23,3; 28,3] kg/m² and was lower (p<0,05) than in group 2, having an average BMI of 34,1 [32; 37,1] kg/m². In group 2, the BGL was higher than in group 1 and was 5,4 [4,9; 7,6] Mmol/L versus 4,9 [4,4; 5,4] Mmol/L, p=0,02, respectively. Hb level was also low in group 2 and was 128 [112; 134] g/L if we compared this to 135 [124; 139] g/L in group 1, p=0,02. Although if we look at group 2, only 21,7% of these participants (n=5) showed anemia of mild (n=4) or moderate severity (n=1). Moreover, a negative correlation was revealed between Hb and ESR in group 2 (R=-0,56, p=0,005).

Several correlations were uncovered in women with BC. This encompasses a positive correlation between BMI and BGL (R=0,30, p=0,03), and a negative relationship between Hb and ESR (R=-0,53, p=0,0001).

Conclusion. Thus, the conducted study showed a high prevalence of obesity (46%) in postmenopausal women with breast cancer and revealed more

significant deviations from the optimal measures in laboratory data: increased ESR, glucose and anemic syndrome.

MOST COMMON RADIOINDUCED REACTIONS OF LUNG CANCER RADIOTHERAPY

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Introduction. The treatment of lung cancer is based on multidisciplinary approach which includes surgery, radiotherapy, systemic therapies such as chemotherapy, immunotherapy and targeted agents, as well as interventional radiology and palliative care. Among these methods, radiotherapy is the only treatment method that is indicated for all stages of the disease and also possible for patients with perfomance status ECOG 3.

Over the years, radiotherapy has advanced rapidly. New methods include standard configuration of computed tomography on linear accelerators, stereotactic ablative body radiotherapy, intensity-modulated radiotherapy and respiratory gating. All these methods are used to decrease incidence of complications of radiotherapy that could occur due to effect to the surrounding normal tissue by large margins of radiation beam and tumour motions.

Occurence of radiotherapy complications can be due to various reasons including, individual radiosensitivity, dose rate, comorbid status and age of the patient, type of radiation, clinical exposure volumes, and the chosen fractionation regimen. There are concepts of "radiation injuries" and "radiation reactions," which are often misinterpreted. A radiation reaction is a reversible functional or morphological change in an organ or tissue that develops within three months of the start of radiotherapy. Radiation damage is an irreversible change in an organ or tissue that often requires special treatment and occurs after radiation exposure. The concept of "toxicity" of radiation therapy (in Russian literature, "radiation complications") is considered separately, which can be acute (early, up to 6 weeks after the start of treatment) and late (after 6 weeks after the start of treatment). Acute toxicity is associated with the reaction of ionizing radiation to radio-sensitive tissues. As a rule, these tissues regenerate well and recover in a short time. Late toxicity concerns radioresistant tissues, changes in which are associated with cytolysis, microcirculatory disorders, and the formation of fibrous and sclerotic changes.

During high-precision radiotherapy of lung cancer, the most common symptoms of acute toxicity that occur during therapy are radio-induced esophagitis, pulmonitis, dermatitis, asthenic syndrome, thoracalgia and cardiotoxicity.

The RTOGEORTC scales are used to standardize assessment approaches and to systematize data on the development of radiation reactions during and after radiotherapy. Assessment of damage to risk organs during planning is carried out in accordance with the dose-volume parameter based on the recommendations of the special group for the analysis of tissue effects of QUANTEC.

Aim of the study. To assess the severity of radiation reactions during and after high-precision radiation therapy for lung cancer.

Materials and methods. A retrospective analysis of outpatient records of patients treated at the Department of Radiology of the Grodno State Clinical Hospital No. 3. The Program Microsoft Excel is used for data processing.

Results and discussion. In the period from March to September 2024, 15 male patients with non-small cell lung carcinomas, histologically verified (86.67% of cases) and based on instrumental diagnostic data (13.33%), were treated using a linear electron accelerator using the VMAT technique at the Department of Radiology of the Grodno City Clinical Hospital No. 3. During treatment, clinical changes in the condition associated with the accumulation of a single focal dose were recorded. The toxic effects of the treatment were also evaluated in patients who arrived for control after treatment (the data are recorded in Tables 1-2.).

Table 1. – **Acute toxic effects of lung cancer radiotherapy (up to 6 weeks from the start of treatment)**

Type of toxicity	Grade 1	Grade 2	Grade 3
Pulmonitis	n=12 (80%)	n=3(20%)	–
Esophagitis	n=3 (20%)	n=11 (73,3%)	n=1(6,7%)
Dermatitis of the chest wall	n=3 (20%)	–	–
Thoracalgia	n=2 (13,3%)	–	–
Asthenic syndrome	n=13 (86,7%)	n=2 (13,3%)	
Cardiotoxicity (blood pressure lability, rhythm disturbances)	–	–	n=1 (6,7%)

Table 2. – **Late toxic effects of lung cancer radiotherapy (after 6 weeks of treatment initiation)**

Type of toxicity	Grade 1	Grade 2	Grade 3
Pulmonitis	–	n=3 (66,67%)	–
Esophagitis	n=2 (13,3%)	–	–
Dermatitis of the chest wall	n=2 (13,3%)	–	–
Thoracalgia	n=2 (13,3%)	–	–
Asthenic syndrome	n=4 (26,6%)	–	–
Cardiotoxicity (blood pressure lability, rhythm disturbances)	–	–	–

Conclusion. Radiotherapy for lung cancer is associated with the development of radiation damage to healthy surrounding organs. The most common acute radiation injuries include esophagitis, pulmonitis, and asthenic syndrome. It is not uncommon for one patient to have a combination of several pathological radio-induced conditions. Pulmonitis is one of the most common late effects of radiotherapy, and its treatment requires long-term support with glucocorticosteroid medications. Before the initiation of radiation therapy, the patient should be informed of the possible reactions to radiation to avoid unexpected situations and it should be clarified that these reactions are treatable if the doctor is informed about them in a timely manner.

CURRENT ASPECTS OF THE SEVERITY OF COGNITIVE IMPAIRMENT IN PATIENTS WITH CRITICAL CAROTID STENOSIS

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Introduction. Stenotic lesions of cerebral arteries of atherosclerotic genesis predispose to the development of cognitive disorders; critical carotid stenosis plays a special role in these disorders. The severity of cognitive dysfunction after correction of carotid stenosis is an important consideration.

Aim of the study. To study the nuances of cognitive changes during the first six months after carotid endarterectomy.

Materials and methods. 83 patients with the diagnosis of critical stenosis of carotid arteries on the background of atherosclerosis were examined. There were 25 women (30.1%) and 58 men (69.9%) among the examined patients. The mean age was 64.8±5.3 years. All patients underwent surgical intervention – eversion carotid endarterectomy (CEA). To analyze the effect of carotid stenosis on cognitive changes, the patients were divided into two groups regarding the neuropsychological test Mini-Cog performed both before and after carotid endarterectomy. Group 1 included 49 patients (59%) who scored 4-5 points; group 2 included 34 patients (41%) who scored 2-3 points.

Results and discussion. The most significant impact on cognitive disorders in patients with critical carotid stenosis is caused by grade III AH (OR=12.8; CI 3.97-41.2). No less impact on the development of cognitive impairment is noted in the case of DM-2 (OR=8.13; CI 2.3-28.7). Other risk factors include postinfarction cardiosclerosis, which also predisposes to cognitive impairment (OR=6.88; CI 0.73-65.02). It should also be noted that before surgery 94.4% of the operated patients successfully answered the first two questions of the Mini-Cog test, whereas the third question caused difficulties in 38.9% of patients. After the operation, according to the results of neuropsychiatric examination, there were no significant changes in answering

the first two questions: 26 patients scored 2-3 points in the Mini-Cog test, and 47 patients scored 4-5 points. However, 86.1% of the examined patients successfully coped with the third question of the test. Three and six months after CEA, 77.6% of patients scored 4-5 points in the Mini-Cog test.

Conclusion. Carotid endarterectomy in patients with carotid stenosis is associated with a positive dynamic regarding cognitive dysfunction. The main risk factors for cognitive impairment are grade III arterial hypertension and diabetes mellitus.

A CLINICAL CASE OF GENERALIZED TUBERCULOSIS. TUBERCULOUS OTITIS MEDIA

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Introduction. Tuberculous otitis media is a rare localization of extra pulmonary tuberculosis (TB). Ear TB is rare among children and also adults (0.05-0.9% in the world). Rareness, lack of information and experience about the disease leads to misdiagnosis and late diagnosis.

Aim of the study. To show the difficulty of diagnosing ear TB.

Materials and methods. The patient's medical documentation was analyzed.

Results and discussion. Patient N., 46 years old, Grodno, a working person. The patient has been ill since January 2021, when there was congestion in the right and left ears, hearing loss, and a whistling sensation in the left ear. He was treated on an outpatient basis (augmentin, doramycin, otofa in the left ear, blowing the auditory tube on the left through a catheter). Hospitalized in the ENT department (05-13.01.21): tympanotomy was performed on the left, conservative therapy was administered.

19.02.-18.03.21 - treatment in the pulmonology department with a diagnosis of Covid-19 infection. Bilateral polysegmental pneumonia of moderate severity. Pleural effusion on the left. RF1. Acute purulent otitis media on the right. Chronic purulent otitis media on the left, exacerbation. Radical surgery on the right ear with tympanoplasty (2022). Admitted to the ENT department (05-09.06.23) with complaints of hearing loss, purulent discharge from both ears, numbness of the right half of the face, headache. 06.06.23 Chest-X-ray – on the right in the root zone, thickening and deformation of the pulmonary pattern is noted. Hospitalized in the GRCC "Phthisiology". The condition is satisfactory. Body temperature – 36.8 ^{0}C. Vesicular breathing in the lungs. RR – 17/min. Heart sounds are rhythmic. HR – 78/min. BP – 125/70 mm Hg.

CT scan of the temporal bone 09.06.23: CT picture of the condition after surgery on the middle ear on the right, tissue deposits in the external auditory

canal and tympanic cavity, blurring of the bone wall of the facial nerve canal, inflammatory changes in the cells of the mastoid process on the right.

09.06.23 Gene Xpert (ear swab): MBT DNA detected, RIF-sensitive. 12.06.23: Gene Xpert (induc. sputum): MBT DNA detected, RIF-sensitive; BACTEC - MBT-. Gene Xpert (urine): MBT DNA detected, RIF-sensitive. 09.06.23: MBT test for DST: (ear swab) Bactec: HREZ-sensitive; Culture (ear swab) - H R E Am Lfx Mfx-sensitive.

13.06.23: CT of the Chest – picture of inflammatory changes of a specific nature.

15.06.23: Urogram – the contours of the kidneys and their structures are not clearly visualized due to increased gas content in the intestines and the presence of fecal shadows.

Diagnosis: Generalized tuberculosis: infiltrative pulmonary tuberculosis MBT+ DS-TB. Tuberculosis of the ears MBT+, DS-TB. Tuberculous papillitis. MBT+, DS-TB. Bilateral purulent epitympano-antral otitis media. Condition after radical surgery on the right ear with tympanoplasty, 2022. Secondary neuropathy of the facial nerve on the right. Urolithiasis: stones in both kidneys. Chronic epididymitis on the left (TB etiology). Hypotrophy of the left testicle.

After 2 months of treatment, clinical and radiological improvement was achieved.

Conclusion. The case demonstrates the development of tuberculous otitis media, proceeding under the mask of chronic nonspecific inflammation. The absence of pathognomonic signs led to late diagnosis and the development of complications.

COCHLEAR IMPLANTATION AS A MODERN METHOD OF HEARING CORRECTION

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Introduction. Cochlear implantation is one of the most effective methods of medical, pedagogical and hearing-speech rehabilitation of children and adults suffering from hearing loss and deafness.

Aim of the study. Purpose of the study is to evaluate such a method of hearing correction as cochlear implantation.

Materials and methods. The materials for the study were obtained from the results of deaf pedagogical research at the Grodno University Clinic on paper and electronic media. The methods used were generalization, research and analysis of deaf-pedagogical data.

Results and discussion. The study involved 106 patients with various forms of hearing impairment aged from 1.5 to 28 years. The patients were

operated in childhood and they are users of the cochlear implant system. The average service life of the cochlear implant was 10 years. In our opinion, an important indicator for assessing the use of cochlear implant systems is the training of patients in general educational institutions (preschool, school, secondary specialized, higher). The distribution of patients by place of education was as follows: 77 respondents (81.1%) study (studied) in general educational institutions, 13 (13.7%) study (studied) in a specialized institution for children with hearing impairments, and 5 (5.3%) of the habilitated study (studied) at home. The distribution of students among general educational institutions was as follows: 57 (74%) people attend (attended) a regular school, 10 (13%) attend (attended) a general preschool institution and 10 (13%) of the respondents receive (received) secondary vocational or higher education. In our opinion, the effectiveness of cochlear hearing aids can also be assessed using the level of speech development of patients and the level of understanding of addressed speech after the installation of a cochlear implant. The distribution of respondents by speech development level was as follows: speech development level - 4 34 (33.7%) respondents, speech development level - 3 38 (37.6%) respondents, speech development level - 2 15 (14.9%) respondents, speech development level - 1 14 (13.9%) respondents. Based on the data, we can conclude that 72 (71.3%) respondents have a high level of speech development. Distribution of respondents by level of understanding of addressed speech: level 4 – 35 (35%) respondents, level 3 – 36 (36%) respondents, level – 16 (16%) respondents, level 1 – 13 (13%) respondents. Thus, 71 (71%) respondents have a normal level of understanding of addressed speech.

Conclusion. Although cochlear implantation is an expensive method of hearing correction, it allows for a significant improvement in the quality of life of patients, as well as the maximum integration and adaptation of patients with hearing impairments into our society.

4-YEAR FOLLOW-UP OF MALIGNANT METASTATIC MELANOMA OF LYMPH NODES WITH UNKNOWN PRIMARY ORIGIN: A CASE REPORT

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Introduction. Melanoma is a tumor that originates from the cancer-causing transformation of melanocytes formed by neural crest cells and a wide spectrum of somatic mutations. The skin is the major organ affected in 90% of the cases, however it can affect any organ where the neural crest migrates. Most cases of malignant melanoma have a clear cutaneous main lesion; yet, they may develop metastatically in the absence of an obvious original tumor – so-called

melanomas of uncertain primary origin.

Aim of the study. This case study hopes to bring more awareness and understanding about malignant melanoma of unknown origin, treatment methods, prognosis and the follow-up investigations and their findings within a span of 4 years.

Materials and methods. A 54-year-old male with no past medical history presented with a tumor-like development in the right axillary region. A skin lesion was removed, revealing a 3.5 cm diameter skin area and a cancer metastasis with a 4.5 cm diameter. The final clinical diagnosis was C77.3 Malignant neoplasms of lymph nodes of the axilla and upper limb. PET scan showed no metabolically active tumor processes, and molecular genetic investigations revealed a negative mutation in the BRAF gene.

Results and discussion. Melanoma of unknown origin (MUP) is the term used when the primary location is typically unidentified. MUP occurs in about 3% of all melanoma patients. About 60% of MUP diagnoses occur in LNs, while about 30% occur in subcutaneous sites. With the lowest percentage (10%) found in visceral organs. In a 2017 study titled "Treatment Outcomes for Metastatic Melanoma of Unknown Primary in the New Era", immunotherapy showed a somewhat higher median overall survival than target treatment; nevertheless, the findings are still unclear because of insufficient data. Following the excisional biopsy, the final diagnosis was made as C77.3: Secondary and unspecified malignant neoplasm of axilla and upper limb lymph nodes.

Conclusion. Most typically, melanoma of unknown origin is identified on suspicion after every other possibility has been ruled out. The sooner patients are diagnosed, the better their prognosis is.

STUDY OF THE EFFECT OF RIFAMPICIN-RESISTANT TUBERCULOSIS IN COMBINATION WITH ALCOHOL DEPENDENCE ON THE LEVEL OF INTERFERON-GAMMA IN THE BLOOD SERUM

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Introduction. The development of tuberculosis in patients with alcohol dependence leads to significant changes in cellular immunity and is characterized by a decrease in the production of gamma interferon (IFN-γ) by T-lymphocytes and impairment of IFN- γ -dependent macrophage activation.

Aim of the study. To study the effect of rifampicin-resistant tuberculosis (RR-TB) and alcohol dependence on the level of gamma interferon in blood serum.

Materials and methods. The study involved 41 patients with RR-TB,

divided into two groups: the main group (MG) consisting of 20 patients with RR-TB and alcohol dependence; and the comparison group (CG) comprising 21 patients with RR-TB without significant risk factors. The control group included 33 healthy individuals. Patients in both MG and CG did not differ significantly in age, gender, or characteristics of tuberculosis inflammation. All patients with RR-TB were examined according to clinical protocols. The level of IFN- γ in serum was determined using an enzyme-linked immunosorbent assay (ELISA). Statistical data processing was performed using STATISTICA software (Version 10.0).

Results and discussion. A comparative assessment of the baseline serum IFN- γ levels was revealed to be significantly lower in patients with RR-TB by 24.7% and 26.4%, respectively, in the MG and CG compared to those in the control group (p 1,2 =0.02) (Table 1).

Baseline levels of IFN- γ in the serum of patients with disseminated forms of MDR-TB

Name of the indicator	Control group, n=33	Patient groups		P
		MG, n=20	CG, n=21	
Serum IFN- γ level, pg/ml	194,1 (77,7-596,4)	146,1 (182,0-246,7)	142,9 (146,4-212,1)	$P_{1,2}$ =0,02 P_{3} =0,4

Note: Comparison of groups: p1, p2 – control group and groups of patients with tuberculosis (main group and comparison group, respectively); p3 – comparison of groups of patients with pulmonary tuberculosis; Mann-Whitney U-test.

The baseline level of IFN- γ in patients from MG and CG did not significantly differ, being 146.1 (182.0-246.7) and 142.9 (146.4-212.1) respectively (p=0.4).

Conclusion. A low baseline level of endogenous IFN- γ was established in patients with RR-TB. The obtained results indicated that the presence of alcohol dependence in this category of patients did not significantly affect the level of IFN- γ.

COMPARISON OF SERUM LIPID LEVELS BETWEEN ISCHEMIC AND HAEMORRHAGIC STROKE PATIENTS: AN OBSERVATIONAL STUDY

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Introduction. Stroke, or cerebrovascular accident (CVA), leads to rapid brain function loss due to disrupted blood supply from ischemia or hemorrhage.

From 1990 to 2010 stroke rates declined by 10% in developed countries but increased by 10% in developing nations. Risk factors include non-modifiable (age, gender, ethnicity, family history) and modifiable factors (hypertension, diabetes, smoking, inactivity, heart conditions).

The relationship between serum lipid levels and stroke incidence is debated. While serum lipids, total cholesterol, triglycerides (TG), low-density lipoprotein (LDL), and high-density lipoprotein (HDL), are essential for bodily functions, studies show mixed results regarding their link to stroke risk.

Aim of the study. This research aimed to analyze the variations in serum lipid profiles among ischemic and hemorrhagic strokes, with the goal of clarifying their potential roles in stroke risk and informing the development of preventive management guidelines for local patients.

Materials and methods. This observational study at the Neurology Department of the Grodno University Clinic, took place from February to December 2024. It involved 20 patients with ischemic stroke and 20 with hemorrhagic stroke. After obtaining informed consent, demographic and clinical data, as well as stroke type, were collected using standardized questionnaires and medical records. Blood samples were analyzed for serum lipid levels, with accuracy ensured. Data were compared between the two stroke groups at a significance level of $p < 0.05$.

Results and discussion. The average age of ischemic stroke patients was 66.7 ± 7.85 years, with 75% (15) male and 25% (5) female. In the hemorrhagic stroke group, the average age was 66.6 ± 9.33 years, comprising 65% (13) male and 35% (7) female. All patients in both groups had a history of arterial hypertension. Among ischemic stroke patients, 80% (16) had coronary heart disease, 15% (3) were obese, and 15% (3) had diabetes. In the hemorrhagic group, 60% (12) had coronary heart disease, 20% (4) were obese, and 15% (3) had diabetes mellitus. The mean total cholesterol level in ischemic stroke patients was 5.48 ± 1.45 mmol/L, compared to 5.04 ± 0.81 mmol/L in those with hemorrhagic stroke. The mean HDL levels were slightly higher in ischemic stroke patients at 1.22 ± 0.37 mmol/L, whereas the hemorrhagic stroke group recorded a mean HDL of 1.18 ± 0.29 mmol/L. For LDL levels, ischemic stroke patients had a mean of 3.42 ± 1.04 mmol/L, while hemorrhagic stroke patients had a mean of 3.17 ± 0.70 mmol/L. Mean TG levels were 1.72 ± 0.65 mmol/L for ischemic stroke patients, in contrast to 1.43 ± 0.50 mmol/L for those with hemorrhagic stroke. Among the ischemic stroke patients, 55% (11) exhibited abnormal total cholesterol levels, while 75% (15) had elevated HDL levels. Furthermore, 65% (13) presented with abnormal LDL levels, and 45% (9) had elevated triglyceride levels. In contrast, the hemorrhagic stroke group showed a lower prevalence of abnormal total cholesterol levels at 45% (9), yet a striking 90% (18) had elevated HDL levels. The LDL levels were notably high in this group as well, with 85% (17) displaying abnormalities, whereas only 5% (1) of hemorrhagic stroke patients had elevated TG levels. In the comparison the p-values were as follows: total cholesterol levels had a p-value of 0.244, HDL levels had a p-value of 0.706, LDL levels had a p-value of 0.375, and TG levels

had a p-value of 0.121. Overall, all p-values exceeded the conventional threshold of 0.05, indicating no significant differences in lipid profiles between the two stroke types.

Conclusion. The analysis shows no statistically significant differences in serum lipid levels between ischemic and hemorrhagic stroke patients, with all p-values exceeding 0.05.Given these findings, further research is needed to explore lipid profiles in stroke patients. Improvements could include larger sample sizes and more diverse populations to better understand the relationship between lipid levels and stroke types.

ISAACS' SYNDROME – POSSIBLE ETIOPATHOGENESIS & CLINICAL ASPECTS

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Introduction. Isaacs' Syndrome (IS) is a rare condition which is characterized by peripheral nerve hyper-excitability which is due to continuous motor activity. The exact etiology for this condition is unknown yet there are several etiopathologies like autoimmune, genetic, or hereditary which can be an etiology for the Isaacs' Syndrome. Its clinical feature includes fasciculation, myokymia, and hyperhidrosis. To confirm the diagnosis mostly imaging methods of examination are performed like MRI, ultrasound, and EMG. In our patient MRI and EMG examination was performed. There are no particular therapeutic treatments that can help in this condition only symptomatic treatment can be delivered. Plasma exchange has a promising outcome for a moment.

Aim of the study. To propose a possible etiology of the condition and highlight effective treatment options.

Materials and methods. 51-year-old female was presented to the regional hospital of Grodno, Belarus with complaints of weakness of the hands more on the right hand, muscle twitching, and general weakness. According to her, since the summer of 2022, the above complaints have appeared. Gradually there was an increase in weakness in both hands and legs.

In February 2023, her symptoms worsened. Therefore, she decided to seek medical help. The patient presented with weakness in her hands, hypotrophy of the muscles, decreased sensitivity in her fingers, tremors in her hands, generalized fasciculation of the arm muscles, shoulder blades, and right thigh, mild paresis of the distal parts of both hands, pyramidal insufficiency of the legs and decreased vision in both eyes. Therefore, she was referred to an ophthalmologist and it was revealed the patient had retinal angiopathy. The patient also complained of mood fluctuations such as excitement, tearfulness, and insomnia. Based on medical history, patient's complaints, objective data, and neurological status the provisional diagnosis was made as ALS

(Amyotrophic lateral sclerosis).

Results and discussion. IS presents with muscle twitching, cramps, hyperhidrosis, and slow relaxation of a muscle after muscle contraction. Our patient had symptoms of weakness, twitching, fasciculation of hand muscles, and decreased vision in both eyes. There can be several causes such as hereditary, genetic, immune-mediated, and other miscellaneous factors. The etiology in our patient could be due to autoimmune, she had an elevated level of anti-TPO.

Another method of establishing a diagnosis is performing an EMG with a high intraburst of irregular frequency. The abnormal EMG is characterized by doublet, triplet, and multiplet single-unit discharges that were also present in our patient. These changes are also known as myokymic and neuromyotonic discharges. The EMG results of the patients showed f-waves and tremors with a lot of artifacts. Patients who had Morvan's syndrome have findings that are similar to those seen in IS, but they also have encephalopathy, headaches, drowsiness, and hallucinations. The patient has not complained of hallucinations, headaches, or drowsiness, nor has she had encephalopathy.

In a patient with Isaacs' syndrome, plasmapheresis resulted in a notable improvement in clinical status, which was accompanied by a reduction in both spontaneous motor unit activity and F-wave after discharge. The patient showed improvement in muscle strength after the course of plasmapheresis for a short time and again the course was repeated.

Conclusion. A 51-year-old female was presented in the Regional Hospital of Grodno, Belarus. The patient presented with general weakness in muscles, muscle twitching, generalized fasciculation, decreased sensitivity in fingers, tremors, decreased vision in both eyes, and mood fluctuation. The exact etiology of her condition was unknown but the possible cause of her condition was an autoimmune; her anti-TPO level was greatly elevated. Hence, the anti-TPO could bind at the neuromuscular junction blocking the release of a trophic factor near the neuromuscular junction. Therefore, there can be elevated levels of LDH and creatine kinase levels as the result of muscle wasting. Her EMG revealed frequent artifacts and her MRI revealed thickening of mucous in the maxillary sinus, Schmorl's bodies, and height and hydration of the discs at the level of C2-C7 were reduced. The patient showed improvement with the repetitive course of plasmapheresis treatment.

CRYPTOGENIC STROKE IN A YOUNG PATIENT AFTER COVID-19 INFECTION

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Introduction. Cryptogenic ischemic strokes are cerebral infarcts that manifest with symptoms, for which no probable cause can be identified after

conducting an adequate diagnostic evaluation. The determination of a stroke as cryptogenic is contingent on the extent and quality of the etiological investigation and current knowledge regarding stroke mechanisms. A significant proportion of ischemic strokes is currently classified as cryptogenic or with an undetermined etiology. The incidence of cryptogenic stroke varies depending on several factors, including the age of the patients, the definition of cryptogenic stroke used, and the range of the etiological investigation.

Aim of the study. To identify possible causes of the condition and further diagnosis and treatment that helped to resolve this rare case.

Materials and methods. A 25-year-old male, was admitted to the emergency department of the Neurology unit at the Regional Hospital of Grodno, Belarus. The patient presented with speech difficulties, which had developed two weeks after a moderate COVID-19 infection. Initially he was diagnosed with mild semantic aphasia. The patient had a history of moderate COVID-19 infection. An angiography revealed that the M2 segment of the middle cerebral artery (MCA) in the left hemisphere was not contrasted, indicating an occlusion. MRI and CT scans showed evidence of ischemic changes in the left hemisphere of the brain. The patient was treated with several drugs, including antiplatelet and neuroprotective drugs.

Results and discussion. Cryptogenic ischemic strokes are typically associated with less severe neurological deficits, lower mortality, and less severe final disability when compared to strokes with identified origins. Our patient presented mild neurological deficits, including semantic aphasia, and made a complete recovery without any disability at the time of discharge from the hospital. The possible sources of cerebral embolism in patients with CIS include the heart, veins of the lower extremities and pelvis, non-stenotic atherosclerosis of the brachiocephalic arteries, non-atherosclerotic vasculopathy, and hypercoagulable conditions, etc. The etiology of the patient's condition may have been autoimmune antibody formation (ANA), which could lead to vasculopathy and the formation of thrombi, ultimately resulting in stroke. ANAs, which can be track down in many autoimmune diseases and viral infections, might be to blame for the vasculopathy. Infections might cause autoimmune reactions through mechanisms such as epitope spreading, molecular mimicry, cryptic antigens, and bystander activation. ANAs, which are typically not associated with autoimmune diseases, have been documented to be caused by transient auto-reactive B and plasma cell reactivation due to infection.

Autoantibodies, such as antinuclear antibodies (ANAs), lupus anticoagulant, anti-Î²2 glycoprotein 1, anti-Ro/SSA, and anti-cardiolipin antibodies, have been discovered in individuals infected with SARS-CoV-2. Various studies conducted on patients with SARS-CoV-2 reveal the prevalence of ANAs between 18% and 57.5%. Our patient also tested positive in the ANA screening test. During the acute stage of the illness, the emergence of autoantibodies is linked to SARS-CoV-2 infections, which supports COVID-19's pathophysiology. Autoantibodies increase in the weeks following recovery but resolve, with a notable reduction in average autoreactivities at 12 months,

with some ANAs still detectable.

Cryptogenic stroke is a diagnosis that is reached by excluding known causes. In our case, the diagnosis was made in accordance with standard guidelines. The physical examination done upon admission revealed only speech impairment. Laboratory diagnostics showed an increase in segmented neutrophils (neutrophilia), a decrease in lymphocytes (lymphopenia), elevated levels of D-dimer, and positive test results for ANA screen Ig (A, G, M). The MRI revealed lesions in both the insula and parietal lobe, while the CT scan showed a subcortical hypodense area with unclear brain contours in the left parietal lobe

Conclusion. Our case demonstrates that autoimmune antibody formation, specifically antinuclear antibodies (ANAs), can cause vasculopathy, leading to thrombus formation and stroke. It suggests a potential link between autoimmune antibody formation and stroke in COVID-19 patients.

COTININE AS AN OBJECTIVE CRITERION OF SMOKING IN CHILDREN WITH ARTERIAL HYPERTENSION

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Introduction. Smoking is one of the leading controllable risk factors for cardiovascular disease. Currently, the high prevalence of smoking among young people is of particular concern. Determination of nicotine metabolites (cotinine) in urine is an effective method for early detection and monitoring of smoking in children and adolescents.

Cotinine is an alkaloid found in tobacco and is also the predominant metabolite of nicotine, typically used as a biomarker for exposure to tobacco smoke.

The formation of cotinine is the leading link in the biochemical transformation of nicotine, as a result of which about 70-80% of nicotine is converted into cotinine. A small part of cotinine (10-15%) is excreted unchanged from the body in the urine, the rest (40-60%) is converted into its main metabolites (trans-3'-hydroxycotinine and cotinine glucuronide).

While nicotine has a relatively short half-life of about 2 hours, cotinine, a principal metabolite of nicotine, has a half-life of approximately 20 hours, and is a specific and sensitive marker for determining exposure to tobacco.

Urine testing is a common non-invasive method of testing for the presence of cotinine due to its ease of use and low cost.

It should be noted that the concentration of cotinine in urine is 4-6 times higher than its concentration in blood or saliva, and is also less subject to daily

fluctuations, which allows urine testing to be considered the most sensitive method for the qualitative and quantitative determination of cotinine.

Aim of the study. To provide an objective assessment of smoking using a qualitative determination of cotinine in urine in children.

Materials and methods. This study is aimed to objectively assess smoking in children via qualitative urine cotinine determination. 110 urine samples from children aged 14-18 were analyzed: 50 with arterial hypertension (Group 1), 30 with high-normal blood pressure (HNBP, Group 2), and 30 healthy controls (Group 3). Prior to urinalysis, a questionnaire assessed hypertension risk factors. Urine cotinine was determined using «ImmunoChrom-KOTININE-Express» test strips (200 ng/ml sensitivity). Statistica was used for data analysis.

Results and discussion. The questionnaire data indicated smoking as a more prevalent risk factor in hypertensive/HNBP groups vs. controls (p=0.01, respectively). Objective cotinine testing revealed positive results in 9 hypertensive children (17.7%) and 5 with HNBP (16.7%).

Combining cotinine test results with the questionnaire data showed 14 participants self-reported active smoking.

Conclusion. This study supports the implementation of rapid cotinine testing as a routine diagnostic tool in pediatric settings for the objective assessment of tobacco smoke exposure, whether active or passive. Its superiority over self-reported smoking history makes it particularly useful for identifying children with episodes of high blood pressure who may be at risk.

Early identification through cotinine testing allows for the creation of targeted interventions aimed at eliminating this modifiable risk factor.

ASSESSMENT OF KIDNEY FUNCTION IN NEONATES WITH CONGENITAL PNEUMONIA

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Introduction. Congenital pneumonia, an inflammatory pulmonary process acquired in utero or during delivery from the post-natal environment, is a major cause of neonatal morbidity and mortality globally. Out of many risk factors, prematurity and low birth weight are two major risk factors for congenital pneumonia, which often exacerbates the disease, and it can be complicated by impaired renal function.

Despite the importance of kidney function in neonatal infections, there is relative paucity of research specifically addressing the spectrum of renal involvement in neonates with congenital pneumonia especially in premature and low birth weight neonates.

Aim of the study. This research paper aims to provide an assessment of kidney function in neonates diagnosed with congenital pneumonia focused on

low birth weight and prematurity.

Materials and methods. This retrospective cohort study analyzed data from 306 neonates diagnosed with congenital pneumonia at the Second Pediatric Department of Grodno Regional Children's Clinical Hospital between January 2020 and December 2023. Inclusion criteria consisted of a diagnosis of congenital pneumonia. Exclusion criteria were birth weight ≥2500 g. Patients were stratified by birth weight and gestational age. Low birth weight (LBW) was defined as birth weight <2500 g. Gestational age categories were:

1) Extreme prematurity: <28 weeks (<196 days);

2) Prematurity: 28-36 weeks (196-258 days);

3) Term: ≥37 weeks.

The primary outcome was glomerular filtration rate (GFR), calculated using the original Schwartz equation (V.V. Kozhekina, L.P. Zharkova, 2023). Secondary outcomes included serum creatinine, renal ultrasound findings (parenchymal changes, pyelectasis, echogenicity), serum urea, total protein, albumin, sodium, potassium, and urine protein.

Results and discussion. A total of 306 cases were analyzed. Of these, 220 (71.9%) had a normal birth weight (≥2500 g), while 86 (28.1%) were classified as having low birth weight (LBW; <2500 g). According to ICD-10 criteria, the LBW group was further categorized into extremely low birth weight (ELBW; <1000 g) and LBW (1000-2499 g).

Within the 86 LBW cases, 20 (23.3%) were classified as ELBW, with a mean weight of 671.75 g. Of these ELBW cases, 9 were classified as extremely premature and 11 were premature based on gestational age.

The remaining 66 LBW cases (76.7% of LBW) had a mean weight of 1704.09 g. Of these, 2 were extremely premature, 60 were premature, and 4 were term. Overall, considering gestational age for all 86 LBW infants, 11 were extremely premature, 71 were premature, and 4 were term.

Reduced glomerular filtration rate (GFR) was evident in 82 of the 86 LBW cases. Specifically, 23.3% (n = 20) of LBW cases with low GFR were ELBW, and 76.7% (n = 62) were LBW. GFR values were categorized into three groups (<15, 15-30, and >30 ml/min/1.73 m^2).

Elevated serum creatinine levels (normal range = 20-88 micromol/L for ages 1 day to 1 month) were observed in 22 of the 86 LBW cases. Of these, 4 (18.2%) were ELBW and 18 (81.8%) were LBW.

Renal ultrasound examinations, performed on a subset of the cohort, revealed abnormalities in 38 cases. Diffuse changes in the renal parenchyma of both kidneys were the most common finding, present in 26 cases. Of these, 3 were ELBW and 23 were LBW. Pyelectasis was observed in 11 cases, including 3 ELBW cases (bilateral pyelectasis in all) and 8 LBW cases (7 unilateral, 1 bilateral). One additional case showed increased echogenicity of the renal parenchyma in both kidneys.

Elevated serum urea levels (uremia; above the normal range of 1.8-8.0 mmol/L) were found in 28 cases. Of these, 4 (14.3%) were ELBW and 24 (85.7%) were LBW. Reduced serum urea levels were observed in 4 additional

LBW cases.

Hyponatremia (serum sodium <135 mmol/L) was reported in 55.8% of the LBW cases, with 17.4% being ELBW and 38.4% being LBW.

Hyperkalemia (serum potassium >6.0 mmol/L) was observed in 10.5% of the LBW cases, with 3.5% being ELBW and 7% being LBW.

Proteinuria was evident in 52.3% of the LBW cases, with 17.4% being ELBW and 34.9% being LBW.

Conclusion. This study highlights the importance of routine renal monitoring in ELBW and LBW infants diagnosed with congenital pneumonia to facilitate early detection and management of kidney dysfunction. The relationship between ELBW/prematurity and specific types of renal dysfunction warrants further investigation.

CLINICAL AND ELECTROCARDIOGRAPHIC PARAMETERS ASSOCIATED WITH OBSTRUCTIVE CORONARY ARTERY DISEASE

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Introduction. Electrocardiography (ECG) remains one of the most widely available methods for assessing the state of the cardiovascular system. In patients with coronary artery disease (CAD) myocardial ischemia is manifested not only by depression of the ST segment on the ECG, but also by an increase in the instability of cardiomyocytes in the phase of ventricular repolarization that is potentially characterized by such parameters as QT interval duration and Tpeak-end interval duration.

Aim of the study. To evaluate clinical and electrocardiographic parameters associated with obstructive coronary atherosclerosis in patients with CAD.

Materials and methods. The study included 63 patients with CAD and stable angina functional class III, referred for coronary angiography to verify the diagnosis of CAD. Patients with at least one stenosis, ≥50% diameter, were classified as having significant CAD. At admission, a resting standard 12-lead ECG was recorded, taken at a paper speed of 50 mm/s. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. According to the results of coronary angiography, 26 (41%) patients did not have hemodynamically significant CAD (stenosis <50%) (Group 1), and 37 (59%) patients had significant CAD (stenosis ≥50%) (Group 2). Patients of both groups were comparable in age, prevalence of hypertension, obesity, diabetes mellitus and atrial fibrillation ($p>0.05$). However, patients of Group 2 were predominantly male (68% vs 42%, $p=0.04$) and more often suffered from myocardial infarction (MI) (35% vs 15%, $p=0.03$)

than patients of Group 1.

According to the results of ECG, patients of both groups didn't have significant differences in heart rate (65 [58; 72] vs 62 [56; 69] b.p.m., $p>0.05$), duration of P wave (96 [80; 115] vs 95 [80; 120] ms, $p>0.05$) and PQ interval (169 [140; 180] vs 170 [140; 180] ms, $p>0.05$). However, QT interval duration was longer in patients of Group 2 compared with Group 1 (405 [380; 420] vs 384 [360; 400] ms, $p=0.049$), as well as Tpeak-end interval duration (98 [80; 110] vs 86 [80; 100] ms, $p=0.019$).

Conclusion. Patients with significant obstructive CAD were predominantly male, more often suffered from prior MI, had higher values of QT interval and T peak-end interval ($p<0.05$) in comparison with patients without coronary atherosclerosis.

INFLUENCE OF LAPAROSCOPIC CYSTECTOMY DUE TO OVARIAN ENDOMETRIOMA ON THE FERTILE PROFILE OF PATIENTS

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Introduction. Endometriosis has become one of the most common gynaecological diseases in females of reproductive age. It has become a leading cause of morbidity and low quality of life in women due to pronounced disorders of reproduction and pain syndrome. Endometriosis is found in up to 25-50% of women with infertility and up to 50% of women who have endometriosis have infertility. Ovarian endometriomas are benign ovarian cysts that occur in 17-44% of patients with endometriosis. Endometriomas compress the blood circulation to the ovarian cortex which leads to follicular loss. Further follicular damage happens due to the inflammation in the cyst wall. These factors lead to the reduction of ovarian reserve. The ovarian reserve is the number of remaining oocytes in the ovary.

The ovarian reserve is measured by serum follicle stimulating hormone (FSH), anti-Mullerian hormone (AMH), estradiol and inhibin B. An elevated level of FSh is observed in decreased ovarian reserve because a higher FSh stimulus is needed for folliculogenesis. AMH is produced by granulosa cells in women of reproductive age. AMH is the best indicator of ovarian reserve. Laparoscopic cystectomy using the strip method is the standard approach for treatment of ovarian endometrioma.

Although the rate of recurrence of cysts is minimal in this approach, it is associated with reduction of the ovarian reserve and causes infertility. It is mainly due to the healthy ovarian tissue removal and incidental damage to the

surrounding ovarian tissue or the blood supply during surgery. Inflammation and scar tissue formation also affects the ovarian function. Overall laparoscopic cystectomy although minimally invasive, leads to reduction of ovarian reserve and overall fertility of women. So, it is crucial for early detection and treatment of endometriomas to preserve the maximum ovarian function and low occurrence of complications.

Aim of the study. To analyze the fertile profile in patients with ovarian endometriomas before and after laparoscopic cystectomy.

Materials and methods. For this statistical research details of 30 patients who were consulted at the consultation center of Women's Health Clinic in Grodno, Belarus were selected. The data was obtained from a computerized database in the clinic. The inclusion criteria were: women aged between 18-40 years, who have undergone laparoscopic cystectomy for ovarian endometrioma. The absolute values of AMH and FSH were calculated before and after laparoscopic cystectomy.

Results and discussion.

- From the 30 patients the percentage variation of AMH after the surgery was analyzed. We revealed the decreasing of AMH after surgery. In 7% of the patients the AMH level has reduced by 0%-24.99%, in 3% of patients the AMH level has reduced by 25-49.99%, in 30% of patients the AMH level has reduced by 50-74.99% and in 30% of patients the AMH level has reduced by more than 75% after the surgery. In 30% of patients the AMH level has increased after the surgery.
- The percentage variation of the FSH levels demonstrates the next results. In 3% of patients the FSH level has reduced after the surgery. In 30% of patients the FSH level has increased by 0-24.99% after the surgery, in 33% of patients the FSH level has increased by 25-49.99% after the surgery, in 17% of the patients the FSH level has increased by 50- 74.99% after the surgery and in 17% percent of the patients the FSH level has increased by more than 75%.

Conclusion.

- Laparoscopic cystectomy led to the decrease in the AMH level in 70% of the total 30 patients.
- Laparoscopic cystectomy led to the increase in the FSH level in 97% of the total 30 patients.
- Therefore, laparoscopic cystectomy for ovarian endometriomas caused reduction in the ovarian reserve of patients.

ON THE ORIGIN OF CATACROTS (EXPERIMENTAL STUDY)

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Introduction. There are currently several methods available for investigating the state of the reflected wave occurring in the vascular system.

These methods include rheography, plethysmography, etc. Each method has its own advantages.

Aim of the study. The aim of this work is to compare the changes in the dicrotic rise above muscular-type vessels (both large and small) studied using impedance rheography after a pharmacological test with amlodipine.

Materials and methods. Measurements were conducted using a rheographic device. Amlodipine, a calcium channel blocker, was chosen as the drug affecting the vascular system. It has a vasodilating effect, reducing the vascular muscle tone.

A pilot study was conducted on a 19-year-old male without any cardiovascular dysfunction. Electrodes were first placed on the upper limbs and then on the lower limbs. After the first recording was made, he was administered amlodipine. One hour later after taking the medication we repeated it.

Results and discussion. Upper limb

Parameter	Hand		Shoulder	
	Before the medication	After	Before the medication	After
Heart Rate(bpm)	63	54	63	54
Rheographic Index	1.21	0.97	0.30	1.08
Time of Slow Filling(s)	0.062	0.062	0.064	0.133
Venous Outflow(%)	52	23	52	28
Dicrotic Index(un.)	0.03	-3.85	-0.04	-0.41
Diastolic Index(un.)	0.29	-2.37	-0.02	-0.50

Lower limb

Parameter	Foot		Shin	
	Before the medication	After	Before the medication	After
Heart Rate(bpm)	68	101	68	101
Rheographic Index	0.48	0.24	1.48	0.61
Time of Slow Filling(s)	0.057	0.056	0.097	0.121
Venous Outflow(%)	175	58	128	29
Dicrotic Index(un.)	0.03	-0.77	0.47	-1.82
Diastolic Index(un.)	0.46	0.61	0.87	8.91

Amlodipine increased the amplitude of the reflected wave over the distribution vessels (forearm, shoulder and shin), while decrease in muscle tone led to the decrease in the amplitude of the dicrotic rise above the resistance vessels (hand and foot).

Conclusion. Finally, it can be stated that the mechanisms of forming the reflected wave over the distribution and resistance vessels are different. The

reflected wave over the distribution vessels is due to reflection from the aortic valve, while over the resistance vessels, there is a dependence on the muscular component of the vessel wall. Thus, the reflected wave depends not only on cardiac output and peripheral vascular resistance, but also on the structural and functional characteristics of larger arteries.

GLYCOGEN STORAGE DISEASE TYPE 1A; A CASE OF UNUSUAL PHYSICAL DEVELOPMENT

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Introduction. Glycogen storage disease (GSD) type I is an autosomal recessive group of rare inherited metabolic diseases including types Ia and Ib, characterized by poor tolerance to fasting, growth retardation and resulting from a defect in the glucose-6-phosphatase system that is required for the hydrolysis of glucose-6-phosphate (G6P) into glucose and inorganic phosphate.

Suspicion and diagnosis of GSD Ia is based on clinical features revolving around doll face, hepatomegaly, fasting intolerance, growth retardation, sometimes followed by nephromegaly, osteopenia and osteoporosis. The disease commonly manifests, between the ages of 3 to 4 months and is confirmed by genetic testing. Here we are discussing a case of accelerated growth in a child affected by GSD Ia that is atypical for this disease.

Aim of the study. To bring awareness of atypical overgrowth in GSD Ia.

Materials and methods. Information extracted from a case report.

Results and discussion. CASE PRESENTATION;

At birth, the baby was macrosomic (4.69kg) with length and head circumference within normal ranges. By day 3, hypoglycemia was detected. Frequent feeding was suggested. By 2 months hepatomegaly and nephromegaly were detected.

During 1^{st} month he gained only 300g through breastfeeding. Later he gained more than 1kg per month through milk formula. By 8 months he had a weight of 11.2kg, height of 73cm and BMI of 21.1. However, by age 4 all indexes except weight reduced from 97^{th} to 50^{th} percentile.

From infancy, he suffered from recurrent respiratory infections (acute bronchitis, pneumonia, acute laryngotracheitis), otitis media, atopic dermatitis, multiple dyspepsia and oral candidiasis. Even though the child was suspected of having GSD when he was 3-4 months, his mother mentioned his excessive sweating and occasional sluggishness with intervals more than 3 hours between feeding that lead to hospitalization. Contrainsular hormone deficiency was excluded. First genetic consultation (TMS) was performed and he was evaluated for metabolic diseases; Lysosomal diseases were undetected. Till 8 months, he

had multiple hypoglycemic episodes, but exact cause was unknown. Despite his unexplained, accelerated growth, glycogenosis was suspected and a blood sample was sent to Moscow for genetic testing that confirmed GSD Ia at 13 months with 2 types of genetic mutations for this disease. Late diagnosis was due to difficulty in accessing genetic testing as it was unavailable in Belarus.

However, GSD Ia, along with influenza, nephrosclerosis lead to severe complications resulting in death.

DISCUSSION:

This case is exceptional, because the boy grew well despite the condition, which usually ensues stunting. The mother ensured that the child was well fed frequently, which could be why he grew well. Gene exams found 2 mutations, which could result in a more severe enzyme deficiency. Chronic hypoglycemia stimulates increased growth hormone production, countering retardation. However, his parents are both tall. Therefore, genetics may have contributed to his size as well. Accelerated growth, which is unusual for this disease, led to the delayed diagnosis of the condition.

The recurrent infections mimicking GSD Ib may be due to dysfunctional neutrophils as a result of hypoglycemia.

Neither a good diet, nor liver transplantation can reverse kidney damage. The final attempt of treating this condition was peritoneal dialysis.

Pneumonia and influenza triggered severe hypoxia with bad tissue perfusion and severe lactic acidosis incompatible with life.

The above complications along with influenza led to his demise.

Conclusion. GSD Ia usually presents with growth retardation from an early age, but it is important to note that normal or overgrowth should not exclude or delay the diagnosis of GSD Ia. However, literature on this aspect is not available, as studies are yet to be performed.

COMPARATIVE EVALUATION OF LONG-TERM OUTCOMES OF VARIOUS SURGICAL INTERVENTIONS FOR PATIENTS WITH CALCULOUS CHOLECYSTITIS COMBINED WITH CHOLEDOCHOLITHIASIS

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Introduction. One of the most complex surgical interventions in hepatobiliary and pancreatic surgery is surgical treatment of patients with acute calcified cholecystitis with gallstones. Many experts believe that to assess the outcome of the operation, it is necessary to take into account both the immediate consequences of the surgical intervention and its long-term effects. According to the literature, when performing cholecystectomy and choledocholithotomy in the traditional way, long-term results are observed with the following frequency:

success – from 60 to 90%; satisfactory outcome – from 12 to 26%; unsatisfactory outcome – from 2 to 11.4%. The frequency of restenosis of the major duodenal papilla (MDP) after endoscopic papillary sphincterotomy (EPS) is from 1.5 to 33.3%, recurrent choledocholithiasis – from 2.0 to 19.9%, reflux cholangitis – 3%.

Currently, reports on the comparative assessment of the long-term results of surgical treatment of choledocholithiasis using various methods of surgical intervention in the world literature remain few and based on an insufficient number of observations. In this regard, scientific research on this topic is important and of practical interest.

Aim of the study. Comparative assessment of remote results for the treatment of patients with calculous cholecystitis in combination with choledocholithiasis using various methods of surgical interventions.

Materials and methods. We analyzed the cases of 30 patients who underwent surgery between 2020 and 2023, with an average age of 62.7 ± 4.3 years. For a more detailed study, the patients were divided into three groups depending on the surgical intervention performed.

Group 1 – 10 patients who underwent two-stage treatment, including endoscopic papillary sphincterotomy (EPS) with stone removal and subsequent laparoscopic cholecystectomy (LC).

Group 2 – 10 patients with cholecystolithiasis who underwent one-stage laparoscopic surgery (laparoscopic cholecystectomy and gallstone removal);

Group 3 – 10 patients who underwent traditional "open" cholecystectomy and cholecystolithotomy with external drainage of the common bile duct (CBD) or cholecystoduodenal anastomosis.

Long-term outcomes were assessed based on the following criteria:

1. Positive outcome. No complaints, complications, or objective/experimental signs of disease in the distal section after surgical treatment.

2. Satisfactory outcome. Despite overall improvement, patients experience recurrent abdominal pain and discomfort (particularly in the right hypochondrium and upper abdomen after eating or physical exertion) and symptoms of indigestion. Signs of recurrent cholangitis are detected using transabdominal ultrasonography, gastroendoscopy (FGDS), or endoscopic retrograde cholangiopancreatography (ERCP), and repeated endoscopic treatment of cholangiolithiasis is required.

3. Unsatisfactory outcome. Cases requiring repeat surgery, bile duct stricture, postoperative hernia, or death.

Results and discussion. The group with good remote results (24-80%) included nine patients from group 1 (90%), eight from group 2 (80%) and seven from group 3 (70%). These patients felt absolutely healthy, were in good condition immediately after the operation and were not subject to strict dietary restrictions. The group with satisfactory remote results (5-16.5%) included one patient from group 1 (10%), two patients from group 2 (20%) and two patients from group 3 (20%). Patients from the analyzed groups complained of regular

pain and discomfort in the right hypochondrium and upper abdomen (after eating or physical activity), as well as the occurrence of some indigestion syndromes. Unsatisfactory results were obtained in one patient from group 3.

Conclusion. The long-term results in patients with calcific cholecystitis complicated by bile duct stones were better in the group undergoing two-stage laparoscopic cholecystectomy (LC) after endoscopic papillary sphincterotomy (EPS) and stone removal.

1. More protection after surgical wound interventions (pyogenic cases, accidents, postoperative ventral hernias)
2. Faster decompression of the bile duct and less trauma.

MODELING OF TYPE 2 DIABETES MELLITUS USING DEXAMETHASONE

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Introduction. Diabetes mellitus (DM) is a high-risk problem of modern medicine. The incidence of type 2 diabetes mellitus (DM2) and obesity has reached epidemic proportions. According to the International Diabetes Federation, about 422 million people worldwide suffer from DM (2017). According to the State Register statistics for 2015, about 4.5 million people in Russia suffer from DM2. According to WHO calculations, the number of patients suffering from diabetes will steadily increase and reach 592 million in 2035, and up to 95% of them will be patients with type 2 diabetes. As it is known, the etiopathogenesis of type 2 diabetes mellitus is based on impaired insulin homeostasis, insulin resistance and dysfunction of insulin-producing beta cells of the pancreas. This leads to the emergence of such pathological phenomena as glucose toxicity and lipotoxicity, which in turn provoke the development of vascular complications.

Aim of the study. The aim of the study was to develop a pathogenetically substantiated model of type 2 diabetes mellitus in rats using a single injection of low-dose dexamethasone, and to evaluate the effect of dexamethasone on lipid metabolism.

Materials and methods. The work was performed on 20 white nonlinear sexually mature rats of both sexes, kept in standard vivarium conditions. Manipulations with laboratory animals were carried out in accordance with the Rules for conducting work using experimental animals. In order to model diabetes mellitus, rats were injected intraperitoneally with dexamethasone at a rate of 125 mcg/kg of body weight for 15 days. The animals were divided into the following groups: Group 1 – control (healthy reference animals that did not receive dexamethasone); Group 2 - with the model of T2DM, rats received dexamethasone at a dose of 125 mcg/kg of body weight for 15 days. At the end

of the experiment, the animals were withdrawn from the experiment by decapitation under anesthesia, with follow-up Determination of glucose and insulin levels in the blood, as well as the lipid spectrum. Differences were considered significant at $p<0.05$.

Results and discussion. the blood glucose level of the animals in the control group remained stable throughout the experiment.

The animals of the 2nd group with the T2DM model who received dexamethasone showed significant hyperglycemia (the level of glucose in the blood serum was 50±1.45 mmol/l compared to 6±1.04 mmol/l in the control group). It increased by 8 times ($p<0.001$), the insulin level increased by 2 times.

With T2DM, not only carbohydrate, but also lipid and protein metabolism is disrupted. After 15 days from the beginning of the experiment, a statistically significant increase in the level of LDL, HDL, triglycerides and cholesterol in the blood of animals of the 2nd group with the T2DM model was noted compared to the control group. In the blood serum of animals with experimental type 2 diabetes, the cholesterol content increased by 2 times ($p < 0.001$), the amount of low-density lipoproteins increased by 4.2 times, the content of high-density lipoproteins did not change, it increased by 2.9 times ($p < 0.001$), triglycerides increased by 3.2 times

Conclusion. The obtained results indicate that with a single administration of dexamethasone at a dose of 125 mcg/kg of body weight for 15 days pathological processes characteristic of type 2 diabetes is reproduced. In animals with a model of type 2 diabetes an increase in the level of glucose, insulin, LDL, HDL, triglycerides and cholesterol in the blood of animals of the 2nd group with a model of type 2 diabetes compared to the control group. The created model can be used to study the pathogenesis of type 2 diabetes, as well as to study the effect of potential hypoglycemic agents

RADIATION-INDUCED ESOPHAGITIS IN PATIENTS RECEIVING RADIOTHERAPY FOR LUNG CANCER

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Introduction. An inflammatory reaction of the esophagus brought on by radiation exposure is known as radiation-induced esophagitis, commonly affecting patients undergoing radiation therapy for malignancies like lung cancer, breast cancer, and lymphomas. Typically emerging within two to three weeks after treatment initiation, this condition manifests as odynophagia, dysphagia, and food impaction. The severity of acute esophagitis is classified using the Radiation Therapy Oncology Group (RTOG) acute esophagitis toxicity criteria.

Aim of the study. To assess factors influencing esophagitis severity based on tumor localization and treatment regimen.

Materials and methods. A retrospective analysis of outpatient records from the radiology department of Grodno City Clinical Hospital No. 3 was conducted. Data processing was performed using Microsoft Excel and Fisher's exact test calculator.

Results and discussion. The study included 15 male patients (mean age 66.3 years) diagnosed with non-small cell lung cancer from March to September 2024. Treatment was delivered using volumetric modulated dynamic irradiation. Among them, 3 patients had peripheral tumors, while 12 had central tumors. Three individuals were found to be at stage I, one at stage II, and eleven at stage III of cancer staging. From the first day of radiation therapy, all patients received proton pump inhibitors (PPIs) and antacids for esophagitis prevention, yet all developed symptoms according to the RTOG scale. The RTOG grading system classifies esophagitis severity from Grade 0 (no symptoms) to Grade 5 (death). Grade 1 represents mild symptoms requiring dietary adjustments, Grade 2 denoting intermediate symptoms needing narcotic analgesics or a liquid diet, Grade 3 representing severe symptoms with significant weight loss or dehydration requiring nutritional support, and Grade 4 includes complete obstruction, ulceration, or fistula, culminating in Grade 5, which signifies death. In our study, no patients developed Grade 4 or 5 esophagitis. One patient had Grade 1 esophagitis, ten had Grade 2, and one had Grade 3 esophagitis among those with central tumors in contrast, peripheral tumors were associated with 2 cases of Grade 1 and 1 case of Grade 2 esophagitis. Out of 12 patients with central tumors, 3 developed ipsilateral atelectasis. PET data were used to refine gross tumor volume (GTV) by integrating pre-radiation images and collaborating with radiologists. Seven patients received classical fractionation, 2 underwent a regimen of 2 Gy/day up to 60 Gy with simultaneous chemoradiotherapy, and 5 received 2 Gy/day up to 66 Gy. Hypo fractionated regimens were chosen for patients with comorbidities or poor ECOG status. Patients with atelectasis experienced Grade 2 esophagitis more frequently. Classical fractionation patients developed esophagitis at a median dose of 18-20 Gy (approximately fraction 9-10 or the end of week 2), while hypo fractionated patients experienced esophagitis at a median dosage between 18 and 21 Gy. The study revealed that esophagitis severity was significantly greater in patients with central lung tumors, particularly when acute toxicity occurred at total focal doses of 18-20 Gy. This highlights the need for vigilant esophageal complication management in patients with centrally located tumors. Fisher’s exact test showed no significant difference ($p > 0.5$) in esophagitis severity between classical and hypo fractionated regimens, indicating fractionation type does not affect toxicity.

Conclusion. In our cohort, esophagitis severity was predominantly influenced by tumor location. However, literature suggests that factors like patient somatic status and irradiated volume also contribute. Additionally, our findings indicate that conventional fractionation with a lower single-fraction dose does not reduce esophagitis severity compared to hypo-fractionation.

STENTLESS RAPID-DEPLOYMENT AORTIC VALVE REPLACEMENT IN A SMALL CALCIFIED AORTIC ROOT: A CASE REPORT

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Introduction. Prosthesis-patient mismatch (PPM) remains a significant concern in aortic valve replacement (AVR), particularly in patients with a small, calcified aortic root. Traditional mechanical and stented bioprosthetic valves may contribute to residual obstruction due to their sewing rings and stents, leading to increased transvalvular gradients. Stentless rapid-deployment bioprosthetic valves provide a larger effective orifice area (EOA) and offer an alternative in complex cases.

Aim of the study. This case study highlights the advantages of using a seamless biological prosthesis with rapid deployment in the setting of mechanical valve replacement failure in a patient with a small, calcified aortic root and annulus.

Materials and methods. Patient data were collected from the Cardiac Surgery Department of the Regional Clinical Cardiology Center in Grodno, while ensuring confidentiality. The patient underwent diagnostic evaluation and surgical intervention due to severe aortic stenosis and failed prior mechanical valve implantation.

Results and discussion. Echocardiographic findings revealed a ring diameter of 18-20 mm with extensive calcification involving the aortic valve, annulus, and left ventricular outflow tract (LVOT), as well as the posterior and lateral walls of the aorta. Initial surgical intervention included two coronary artery bypass grafts (CABG), with a distal autovenous vein anastomosis performed in the right coronary artery (RCA) at segment 3 and a distal left internal mammary artery (LIMA) anastomosis to the left anterior descending (LAD) artery at segment 2.

Following valve excision, the measured aortic ring diameter ranged from 19 to 21 mm. Given the patient's body surface area (BSA) and the indexed effective orifice area (iEOA), a 21 mm mechanical prosthesis (Planix-I, s/n 2524) was initially implanted using an 18 U-shaped supraannular suture technique with Cor-Knot fixation. However, valve mobility was compromised due to the small ring diameter, necessitating removal of the mechanical prosthesis and re-evaluation of the surgical approach.

A seamless, rapid-deployment bioprosthesis (Perceval Plus M, size PF5965A) was subsequently implanted, followed by aortic wall suturing using a sandwich technique at the site of lateral wall calcification. The final surgical outcome demonstrated improved hemodynamic parameters and successful implantation without residual obstruction.

Conclusion. In cases where mechanical valve replacement is dysfunctional due to a small, calcified aortic annulus, stentless rapid-deployment bioprosthetic valves offer an effective solution. They provide excellent hemodynamic performance, while eliminating the need for aortic root enlargement procedures. Additional benefits include reduced cardiopulmonary bypass (CPB) and cross-clamp times, decreased risk of paravalvular leak (PVL), and avoidance of long-term anticoagulation therapy. These findings support the use of seamless biological prostheses as a viable alternative in challenging AVR cases.

REPRESENTATION OF THE CATEGORY OF SPACE IN ANATOMICAL TERMINOLOGY

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Introduction. Anatomical terminology is essential for clear medical communication, standardizing the description of the human body's structure and spatial relationships. Derived largely from Latin and Greek, terms like *anterior*, *posterior*, *medial*, and *lateral* provide precise localization, while compound terms (e.g., *sternocleidomastoid*) illustrate complex spatial relationships. This report examines how space is represented in anatomical language, integrating insights from gross anatomy, organ construction, and histology.

Aim of the study.

The study aims to:

- Identify semantic patterns in anatomical spatial terms.
- Examine word formation methods, including affixation, compounding, and borrowing.
- Analyze spatial features based on four properties: locative, metric, kinetic, and formative.
- Investigate how geometric constructs (points, lines, planes, axes, and volumes) are employed in anatomical descriptions.

Materials and methods.

A corpus of anatomical terms was compiled from *Terminologia Anatomica*, Gray's Anatomy, histological atlases, and medical dictionaries. A semantic analysis categorized terms into:

- **Locative Features:** Indicating position (e.g., *superior*, *inferior*, *anterior*, *posterior*, *medial*, *lateral*).
- **Metric Features:** Describing measurable aspects (e.g., *proximal*, *distal*, *intercostal*).
- **Kinetic Features:** Relating to movement (e.g., *flexion*, *extension*, *rotation*).
- **Formative Features:** Denoting shape and structure (e.g., *fossa*, *sulcus*, *tubercle*).

Morphological analysis focused on affixation (prefixes like *sub-* and *supra-*), compounding, and the borrowing of Latin/Greek terms. Additionally, the study examined geometric constructs points (e.g., Bregma), lines (e.g., midclavicular line), planes (e.g., *planum sagittale*), axes (e.g., longitudinal axis), and volumes (e.g., *cavitas thoracis*).

Results and discussion.

The analysis revealed that anatomical terms are systematically organized by spatial properties:

- **Locative Terms:** Define positions; for example, *cavitas oris* (oral cavity) indicates a specific region.
- **Metric Terms:** Quantify spatial dimensions, crucial for imaging and surgery.
- **Kinetic Terms:** Describe movements such as *flexion* and *extension*, important in orthopedics and physical therapy.
- **Formative Terms:** Convey shape, aiding in the identification of structures (e.g., *tubercle*).

Morphological patterns show that consistent use of prefixes, suffixes, and compounds (often borrowed from Latin/Greek) ensures clarity. Geometric constructs further enhance these descriptions, providing a framework for visualizing the body in three dimensions.

Conclusion. Spatial properties in anatomical terminology (locative, metric, kinetic, and formative) are fundamental for precise medical communication. The systematic use of Latin and Greek terms, along with geometric constructs, underpins a universal language that supports accurate anatomical descriptions. This enhances medical education, diagnostic imaging, and surgical planning, fostering global consistency in healthcare.

LEVELS OF INFLAMMATORY CYTOKINES IN PATIENTS WITH DIFFERENT PHENOTYPES OF HEART FAILURE

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Introduction. Heart failure (HF) is divided into heart failure with reduced ejection fraction (HFrEF) and heart failure with preserved ejection fraction (HFpEF). The association between HF and inflammation was first recognized in 1990 by Levine et al, who reported elevated levels of TNF in patients with HFrEF. To date, the levels of C-reactive protein (CRP), interleukin 6 (IL-6), and interleukin 1-beta (IL-1) are verified to be increased in plasma of HF patients. The presence of these prototypal pro-inflammatory cytokines and mediators has been linked to worse prognosis. Current clinical trials are investigating on the effectiveness of IL-1 blockade to reduce inflammation, reduction in ventricular remodelling, and improved exercise capacity in patients with HF.

Aim of the study. To evaluate levels of inflammatory cytokines (IL-1 and CRP) in patients with different phenotypes of chronic HF.

Materials and methods. The study included 76 patients with HF of NYHA functional classes I-IV. 46 (61%) patients had a preserved LVEF (≥50%) and 30 (39%) had reduced LVEF (<50%). The inclusion criteria were patients with HF diagnosed based on ESC (2021) guidelines, age >18 years and agreement to participate in the study.

Exclusion criteria from the study were: chronic rheumatic heart disease, acute STEMI, acute myocarditis and endocarditis, prosthetic heart valves, oncological diseases and severe concomitant extracardiac pathology accompanied by systemic inflammation.

All patients underwent clinical, laboratory, and instrumental studies, including determination of CRP and IL-1 levels in venous blood serum using enzyme immunoassay. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients with HFrEF and HFpEF were comparable in age 59.4 [51.3; 66.8] vs 63.9 [58.5; 70.3] years, p>0.05) and gender (male gender 61% vs 63%). Also, both groups were comparable in prevalence of obesity (37% vs 37%, p>0.05) hypertension (91% vs 80%, p>0.05) and myocardial infarction history (33% vs 40%), p>0.05). However, patients with HFrEF more often suffered from atrial fibrillation, (53% vs 24%, p=0.028) than patients with HFpEF. Also, patients with HFrEF were characterized by higher HF NYHA class (Class 3-4 in 19% of Group 1 and 67% of Group 2, p=0.001).

In biochemical blood test patients didn’t show significant intergroup differences in values of renal function tests, total cholesterol, triglycerides, sodium and potassium (p>0.05). However, patients with HFrEF had significantly higher levels of BNP 817 [812.5; 821.5] vs 440.68 [164; 728] ng/mL, p=0.04) and NT-proBNP (4304 [1473; 5702] vs 2640 [32; 2126] pg/mL, p=0.02).

When conducting an enzyme immunoassay in patients of the HFrEF group, the CRP level was 3.95 [3.55; 4.41] mg/L, and in patients of the HFpEF group – 3.52 [2.87; 4.16] mg/L, these differences were statistically significant (p=0.011). However, there were no intergroup differences in IL-1 level (8.20 [2.70; 12.75] vs 7.09 [2.87; 9.16] pg/mL, p=0.66).

Conclusion. Patients with HFrEF had higher values of CRP (p<0.05) in comparison with patients with HFpEF. However, there were no intergroup differences in IL-1 values (p>0.05). Reliability of the obtained results should be further checked on larger samples of patients.

LIFE EXPECTANCY OF PATIENTS WITH LARYNGEAL CANCER AS PART OF MULTIPLE PRIMARY TUMOURS: A RETROSPECTIVE COHORT STUDY BASED ON TREATMENT MODALITIES IN THE GRODNO REGION, BELARUS (2001-2018)

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Introduction. Laryngeal cancer is a malignancy most frequently presented in otolaryngology. In Belarus, incidence rate for laryngeal cancer is 9.8%, predominantly affecting men aged 50-60.

Multiple Primary Tumors (MPT) are defined by presence of two or more primary independent malignancies in a patient. The lack of awareness about MPT causes inadequate diagnoses, leading to poor outcomes.

Aim of the study. The aim of this study is to evaluate life expectancy of laryngeal cancer patients as a part of MPT, depending on the detection sequence and type of treatment received. Findings could guide clinical decision making and improve patient care.

Materials and methods. The retrospective cohort study was conducted to determine the survival rates of 66 adult patients with a diagnosis of laryngeal cancer in combination with neoplasm of other organs in Grodno, Belarus between 2001-2018. The patients taking part in the study had a clinical diagnosis of laryngeal cancer as a part of MPT and had complete medical records and follow-up data. Patients with incomplete records and those diagnosed with metastatic laryngeal cancer were excluded. The life expectancy of the patients based on tumor sequence, treatment modalities and the 5-year survival rate were calculated.

Results and discussion. 66 patients were involved, with 65 men (98.48%) and 1 woman (1.52%). The mean age was calculated to be 59 years, with 71.2% of patients aged 50-60 years.

Laryngeal cancer was first tumor diagnosed in 23 patients (34.85%), second tumor in 33 patients (50.0%) and was synchronously diagnosed in 10 patients (15.15%). Therapeutic tactics employed were: surgery in 2 cases (3.03%), radiation therapy in 32 (48.48%), chemotherapy in 1 (1.52%), combination therapy in 24 (36.36%) and no treatment in 7 (10.61%).

Average life expectancy was determined according to the tumor sequence. In cases where laryngeal cancer was diagnosed as first tumor, it was 24.87±14.45 months. As second diagnosed tumor, it was 51.22±25.52 months.

Five-year survival rate was calculated. In patients with laryngeal cancer as first tumor, it was 21.74%; when it was second presented tumor, it was 39.39%. In cases of synchronous tumors, it was determined as 30%.

This study highlights role of tumor diagnosis sequence and treatment strategies in patients with laryngeal neoplasms as a part of MPT.

Radiation was the frequently used mode of intervention. Second highest was combined therapy, showing potential for better improved outcomes and may increase survival rates. Treatment was absent in 7 cases due to patient's refusal to undergo anti-cancer therapy.

Patients with laryngeal cancer as second tumor had a longer mean life expectancy in comparison to when laryngeal neoplasm was discovered first. This may stem from the fact that detection of subsequent malignancies would have been faster after the discovery of an initial tumor. This could lead to early detection of possible silent tumors, greatly impacting survival rates. The lower 5-year survival rate for laryngeal cancer as first tumor in comparison to when it was second tumor discovered, also supports the hypothesis that late detection of primary tumors adversely impacts patient's prognosis.

The high proportion of laryngeal tumor as a part of MPT cases presenting as second tumor underscores importance of careful surveillance of already diagnosed patients to detect metachronous malignancies as early as possible.

The relatively small sample size limits ability to generalize its findings. The lack of data on comorbidities, tumor stage and lifestyle factors (whether patient ceased smoking post-diagnosis, etc.) may further limit this study.

The predominance of male patients is also a limitation. This gender disparity aligns with global epidemiological trends of laryngeal cancer, likely due to higher exposure to established risk factors like tobacco use, alcohol consumption and occupational toxins. This emphasizes the need for preventative strategies and screening methods in high-risk patients. Future studies with larger sample sizes that take into account these limitations would offer further insight on this topic. Modern management methods, such as immunotherapy, would help to refine prognosis and therapeutic strategies.

Conclusion. In patients with laryngeal cancer as a part of MPT, life expectancy is affected by sequence of tumor detection as well as treatment strategies employed. Combined therapy in case of metachronous tumors has been shown to improve poor outcomes. These findings emphasize importance of clinical vigilance in patients with MPT; early detection is vital in improving life expectancy.

EFFECT OF BURNOUT ON ACADEMIC PERFORMANCE OF MEDICAL STUDENTS IN VITEBSK STATE MEDICAL UNIVERSITY

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Introduction. Introduction. Researches indicate higher level of stress and burnout amongst medical students compared to general population. Christina

Maslach and her colleagues described burnout as a multidimensional psychological syndrome that causes cynicism, emotional exhaustion and diminished feelings of personal achievements. Academic burnout was defined by Meier and Pines as the appearance of these symptoms in an academic setting.

Aim of the study. The aim of this study is to examine the level of burnout among medical students in Vitebsk State Order of Peoples' Friendship Medical University.

Materials and methods. A cross-sectional online study was done based on the MBI-SS and a Google form was shared via a link. A total of 300 students completed the survey.

Results and discussion. The total score for Burnout for all the respondents was 92 points (Table 1). First year students had the highest level of burnout among all the courses with a total score of 103 points and the lowest level of burnout was in the 6th-year students with a score of 78 points. 52 students said that there was a significant impact of burnout on their academic performance. 27% students believe their grades are constantly affected due to burnout.

Table 1. – Burnout scores of the participants

	1st year	2nd year	3rd year	4th year	5th year	6th year
Emotional exhaustion	45	36	40	36	35	29
Depersonalization	21	21	23	20	20	18
Reduced personal achievement	37	34	34	36	36	31
Mental burnout	103	90	97	91	90	78

Conclusion. It is vital for institutions to take burnout symptoms into consideration to foster a healthy learning environment. Strategies that have been described to alleviate burnout in students include establishing mentorship programs, providing psychological support and measures to improve relationship between the students and faculty members.

BENIGN RETROPERITONEAL CYSTIC TERATOMA: LAPAROSCOPIC TREATMENT WITH DIAPHRAGM PLASTY

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Introduction. Retroperitoneal masses, which can be benign or malignant, often grow silently due to the loose connective tissue in the retroperitoneal space. Benign masses include lipomas, teratomas, and lymphangiomas. Retroperitoneal cysts, often embryonic in origin, are typically asymptomatic,

until they compress adjacent organs, causing nonspecific symptoms like abdominal discomfort. This case report presents a rare instance of a retroperitoneal cystic teratoma in a 55-year-old male, initially misdiagnosed as a parasitic liver cyst.

Aim of the study. To highlight the diagnostic challenges and the successful laparoscopic management of this condition.

Materials and methods. A 55-year-old male presented with chronic right hypochondrial pain. Initial ultrasound suggested gallstone disease and a liver cyst. Magnetic resonance imaging (MRI) revealed a heterogeneous fluid collection in the liver's lower posterior aspect and gallstones. Blood tests showed elevated liver enzymes (AST: 135 U/L, ALT: 173 U/L) and C-reactive protein (80 mg/L), indicating inflammation.

The patient underwent laparoscopic cholecystectomy and liver cyst resection. Intraoperatively, a 5 cm retroperitoneal cystic mass connected to the diaphragm was discovered. The mass was excised using monopolar coagulation, and the diaphragm was resected and repaired laparoscopically. The abdominal cavity was drained, and the specimen was sent for histopathological analysis.

Results and discussion. Histopathology confirmed a benign retroperitoneal cystic teratoma with calcified and necrotic areas. The patient’s postoperative recovery was smooth, with no complications. He was discharged on the seventh day for outpatient follow-up.

Retroperitoneal cysts are rare and often asymptomatic, making diagnosis challenging. This case underscores the importance of preoperative imaging, such as MRI and CT, for accurate diagnosis and surgical planning. The initial misdiagnosis of a parasitic liver cyst highlights the complexity of retroperitoneal masses.

Laparoscopic surgery proved effective for this retroperitoneal teratoma, offering advantages like reduced postoperative pain, faster recovery, and fewer complications. The use of advanced laparoscopic tools facilitated precise dissection and diaphragm repair. This case aligns with existing literature supporting laparoscopic excision for benign retroperitoneal tumors.

Conclusion. This case report underscores the complexity and diversity of retroperitoneal cystic lesions, emphasizing the importance of accurate imaging and histopathological assessment in diagnosis and treatment planning. Retroperitoneal tumors, though relatively uncommon, can present significant diagnostic challenges due to their silent growth and potential for misdiagnosis, as illustrated by the initial misclassification of the cystic teratoma in this case. The case highlights the critical role of advanced imaging modalities, such as CT and MRI, in preoperative planning, particularly for tumors located near major vascular structures or involving adjacent organs like the diaphragm. These imaging techniques are invaluable for anticipating surgical challenges and minimizing perioperative complications.

The successful laparoscopic removal of the retroperitoneal teratoma in this case further supports the growing body of evidence favoring minimally invasive techniques for managing benign retroperitoneal tumors. Laparoscopic excision

offers several advantages, including reduced postoperative pain, faster recovery, and lower complication rates, making it a preferred approach for such cases. However, the case also highlights the need for further research, particularly in refining surgical techniques and establishing evidence-based guidelines for managing retroperitoneal tumors with diaphragmatic involvement.

GENETIC POLYMORPHISM G84A IN NOS1 GENE IN PATIENTS WITH ATRIAL FIBRILLATION

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Introduction. The NOS1 gene is located on the long arm of chromosome 12 (12q24.22) and includes 33 exons. More than 100 polymorphisms of the NOS1 gene are known. In clinical studies exploring this polymorphism, the presence of the recessive A allele was significantly associated with the development of ischemic stroke, type 1 diabetes mellitus, post-traumatic gonarthrosis, and decreased vasodilation in myocardial infarction. To date, no clinical studies have been conducted on the relationship between the development of atrial fibrillation (AF) and the G84A polymorphism of the NOS1 gene, which explains the relevance of this study.

Aim of the study. To evaluate genetic polymorphisms in NOS1 gene in patients with sinus rhythm and AF.

Materials and methods. The study included 91 patients with coronary artery disease and/or hypertension who were admitted to the Grodno State Cardiological Center for treatment. 49 patients (53.8%) had paroxysmal or persistent form of AF, while 42 patients (46.2%) had sinus rhythm. All patients underwent clinical, laboratory, and instrumental studies, including the determination of the G84A polymorphism of the NOS1 gene using the polymerase chain reaction technique. Statistical analysis was performed using the STATISTICA 12.0 software package.

Results and discussion. Patients with AF and sinus rhythm were comparable in age and gender ($p>0.05$). Patients with AF had significantly higher body mass index (32.7 [29; 36] vs 29.4 [27; 31] kg/m2, $p=0.008$) and more often had obesity (51% vs 19%. $p=0.001$) than patients with sinus rhythm. Patients of both groups had no difference in prevalence of hypertension (91% vs 92%, $p>0.05$) and diabetes mellitus (8% vs 7%, $p>0.05$). It is interesting to say, that patients with sinus rhythm more often had stable angina (64% vs 26%, $p=0.002$), however myocardial infarction prevalence in both groups was comparable (15% vs 12%, $p>0.05$).

The distribution of genotype and allele frequencies for the G84A polymorphism of the NOS1 gene showed that the dominant allele G was found in 70.3% of cases and the recessive allele A was found in 29.7% of cases. The

distribution corresponded to the Hardy-Weinberg equilibrium (q=1.37, p=0.69).

When assessing the relative risk of AF development depending on the polymorphic variant of the NOS1 gene, the following results were obtained. The presence of the recessive allele A in the genotype was associated with an increased risk of AF (RR=1.92, 95% CI 1.16-3.18, p=0.03). At the same time, the presence of the G allele in the genotype reduced the risk of AF development (RR=0.77, 95% CI 0.64-0.93, p=0.008), as did the presence of the GG genotype (RR=0.64, 95% CI 0.43-0.95, p=0.01).

Conclusion. Patients with the recessive allele A of the G84A polymorphism of the NOS1 gene have an increased risk of AF development, which can be taken into account in the differentiated therapy of patients with cardiac arrhythmias.

SURGICAL VIEWS ON THE TREATMENT OF CHRONIC OSTEOMYELITIS

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Introduction. Chronic osteomyelitis currently remains a pressing problem of modern medicine and is of great social significance, since the largest group of patients is people of working age. Regardless of the achieved treatment results, infection remains quite high. Wound suppuration is associated with changes in the invasive properties of microorganisms, disruptions in the body's immune system, and the mechanical interventions themselves during the treatment of the disease.

Aim of the study. To improve the results of treatment of patients with chronic osteomyelitis of tubular bones, using an autograft and platelet-enriched plasma, increasing the immune status.

Materials and methods. The study was conducted among 89 patients with chronic osteomyelitis (HO) of long tubular bones who were on inpatient treatment at the BUZ UR GKB No. 6 of the Ministry of Health of the Russian Federation, Izhevsk. The main group included 48 (53.9%) patients who were treated with plastic surgery of the residual bone cavity (CP) with autogenous bone tissue of the perifocal region in the form of "chips" with the addition of platelet-enriched plasma and the drug Roncoleukin was administered to them to increase their immune status.

The comparison group consisted of 41 (46.1%) patients whose treatment was carried out by other methods of plastic surgery (muscle on the proximal pedicle, combined musculoskeletal, filling with an adhesive composition). The average age of the patients was 38.9±1.9 years and 34.7±2.0 years, respectively. Both groups were dominated by men. In 50.6% of all cases, the process was localized in the femur, in 40.5% – in the tibia, in 6.7% – in the humerus, in 1.1%

– in the ulna and in 1.1% – in the radius. The average duration of the disease was more than 7.5 years. In 60.7% of all patients, post-traumatic HO was observed, in 36.0% – chronic hematogenic and in 3.3% – postoperative.

The diagnosis was confirmed using clinical, radiological methods, fistulography, computed tomography, morphological, bacteriological research methods. When performing plastic surgery in patients of the main group, autogenous bone tissue in the form of "chips" was taken 0.3-0.5 mm thick with a chisel and mixed with platelet-enriched plasma before filling the CP. The residual CP was filled compactly with the remaining bone chips and thereby created conditions for revascularization of the bone graft. The operation was completed by maximum convergence of the edges of the periosteum with careful layered suturing of the wound. Immediately after the operation, an intravenous solution of 1.0 mg Roncoleukin was administered at intervals of 1-3 days, 3 injections per course.

Results and discussion. Positive results of treatment of this group were noted in comparison with the group, where various plastic surgery was performed: signs of inflammation were noted with significantly lower frequency, macroscopically it was established that the inner wall of the osteomyelitic cavity (ICOP) had signs of a degenerative nature, microscopy of fragments of bone tissue in the vast majority of patients of ICOP was represented by compact osteosclerosis. Autogenic bone "chips" from the perifocal region are sterile, have plastic properties, have great resistance to infection of the osteomyelitic focus and its use prevents the development of histocompatibility and invasion of blood-borne diseases. And the concentration of platelets has an osteoinductive effect. Satisfactory results were noted in 91.7% of patients, the number of relapses decreased from 24.4% to 8.2%.

Conclusion. An integrated approach in the surgical treatment of patients with chronic osteomyelitis is effective and significant in the application of new technologies.

NEURO-DYNAMIC ELECTRICAL STIMULATION (NEURODENS) IN THE COMPLEX TREATMENT OF VARICOSE VEINS OF THE LOWER EXTREMITIES

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Introduction. Varicose veins of the lower extremities are one of the most common pathologies in the modern world. According to the World Health Organization, every fifth adult on the planet suffers from this disease. The annual increase in new cases of VVL in industrialized countries is 2-2.6%. Almost 38 million residents of Russia, regardless of the region, suffer from

chronic venous insufficiency (CVI) of the lower extremities, the cause of which is VVL. Half of them require surgery, 5 million patients have trophic disorders of the lower extremities, 1.8 million have a disability due to CVI. With the advent of more advanced diagnostic methods, increased life expectancy, and increased public awareness of the problem of VVL, there has been a trend towards an increase in the number of patients with VVL. According to a survey of the adult population of different countries, the incidence of the disease varies from 2 to 60%. In the recent past, one of the largest epidemiological studies on the prevalence of chronic venous diseases, including VVD, was conducted, the Vein Consult program, which involved almost 100 thousand people from 20 countries.

Aim of the study. To use NEURODENS as a pathogenetically substantiated component of complex treatment of symptoms and syndromes associated with CVD and CVI, in the rehabilitation period after phlebotomy and evlo surgery for varicose veins of the lower extremities, as well as for the prevention of venous thromboembolic complications and improving the results of treatment of varicose veins after sclerotherapy.

Materials and methods. The experimental work was performed on 52 patients of the surgical department of the State Budgetary Healthcare Institution of the Ural State Clinical Hospital No. 6 of the Ministry of Healthcare of the Republic of Izhevsk, of which 17 (32.7%) were men and 35 (67.3%) were women, with an average age of 42.6±1.2 years. All of them underwent procedures of neuromuscular electrical stimulation (EMS) of the muscles of the lower leg and thigh that continued for the next 10-15 days. For this, we used the NEURODENS device, 2 pairs of electrodes were placed on the lower limb, the first – in the projection of the gastrocnemius muscles, the second was fixed on the thigh. Low-frequency pulses of 50 ms duration were used at a current strength of 30-40 mA up to 5 times a day; after applying the electrodes, the limb was bandaged with two or three elastic bandages (depending on the diameter and length of the limb, the duration of the procedure was 30 min. After the electrical stimulation session, the electrodes were removed and elastic bandages were applied from the toes to the upper third of the thigh.

Results and discussion. The effectiveness of the treatment was assessed based on the ultrasound examination of the vessels of the lower extremities. The absence of ultrasound signs of a "fresh" thrombus, pulmonary embolism (PE) during echocardiography and perfusion lung scintigraphy were considered positive results, since the defeat of new venous segments leads to the formation of thrombi and embolization of vessels, thereby complicating the course of the disease. According to our research, only 3 (8.6%) women had a relapse of the disease in the late period, in men – only in 3.7% of cases. The recommended NEURODENS regulations were fully completed by 52 patients. 8 respondents regularly missed the daytime procedure, citing the specifics of their work activities and the inconvenience of performing it at the workplace in the presence of other people. Nevertheless, the treatment results were assessed for all 52 patients. Evening swelling completely disappeared in 59.4% of

observations, in 34.4% of cases it decreased, and in 6.2% it remained without dynamics. Venous pain was present in 87.5% of patients. Its average intensity before the start of treatment was 4 points on the CIVIQ scale. On the 15th day, the pain syndrome decreased to 2 points on the CIVIQ scale.

Conclusion. 1. NEURODENS is an effective and pathogenetically substantiated method of treating CVD, related to the 3rd clinical class (chronic venous edema) according to the international classification CEAP with the implementation of NEURODENS

2. The use of NEURODENS for 15 days is well tolerated by patients, gives a pronounced clinical effect, turning into a 3-month remission in 59.4% of cases.

3. The overwhelming majority of patients withstand the recommended NEURODENS schedule without adjusting their usual work activities.

4. NEURODENS after sclerotherapy can be used in the complex conservative treatment of patients with varicose veins. However, the small volume of studies and the lack of an adequate control group do not allow us to draw final conclusions. Therefore, the studies will be continued.

GENDER DIFFERENCES IN PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCTION

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Introduction. Acute coronary syndrome refers to a group of conditions that causes reduced blood flow to the heart. Some conditions include ST-elevation myocardial infarction (STEMI), Non-ST-elevation myocardial infarction, and unstable angina. Common risk factors include smoking, hypertension, diabetes, high cholesterol and family history; however, age and sex have a major impact on the severity and prognosis of STEMI. According to the recent studies, younger women have a higher risk of mortality from STEMI than men, when the comorbidities are unadjusted, and older women have a lower risk of adverse outcomes when compared with older men.

Aim of the study. To establish clinical, anamnestic and laboratory differences in male and female patients with STEMI.

Materials and methods. The study included 100 patients with STEMI who were admitted to the Grodno State Cardiological Center for treatment from January to November 2024. Group 1 included 50 female patients, while Group 2 included 50 male patients. All patients underwent clinical, laboratory, and instrumental studies, including coronary angiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Female patients were significantly older than males (62.1±9.1 vs 57.6±9.2, $p=0.017$). Both groups were comparable in prevalence of hypertension (94% vs 96%, $p>0.05$), obesity (54% vs 48%,

p>0.05), and atrial fibrillation (0% vs 8%, p>0.05). However male patients more often had diabetes mellitus (36% vs 26%, p=0.047) and higher heart failure NYHA class (Class 3-4 in 58% of males and 28% of females, p<0,01).

It is interesting to note, that females more often had anterior STEMI (52% vs 36%, p=0.03), while males had inferior one (34% vs 48%, p=0.04). There were no differences in prevalence of other localizations of MI.

According to the results of clinical blood count, patients of both groups didn't have significant differences in number of WBCs (8.1 [6.9; 9.2] vs 8.2 [6.5; 9.2] *10x9, p=0.87). Number of RBCs (4.6 [4.3; 5.1] vs 4.2 [3.8; 4.6] *10x12, p=0.04), hemoglobin (145 [137; 155] vs 125 [118; 134], p=0.027) and ESR (20.5 [10; 30] vs 15.3 [6; 20] mm/h, p=0.017) were higher in male patients. Interesting to note, that number of platelets was higher in females (291 [245; 325] vs 252 [190; 284] *10x3, p=0.04).

In biochemical blood test male patients had higher levels of urea (p=0.039) than females, however their creatinine levels were comparable (p=0.53). There were no intergroup differences in values of total cholesterol (p=0.23), triglycerides (p=0.54) and low-density lipoproteins (p=0.45), however high-density lipoproteins were higher in females than in males (1.08 [0.82; 1.19] vs 0.89 [0.73; 1] mmol/L, p=0.034). Also male patients with STEMI had significantly higher troponin levels (8427 [570; 9963] vs 11192 [151.5; 13656] ng/L, p<0.001).

Conclusion. Male patients with STEMI were younger, more often had diabetes mellitus and higher heart failure NYHA class. In laboratory tests males were characterized by higher levels of urea, glucose and troponins and lower levels of low-density lipoproteins (p<0.05).

EARLY DIAGNOSIS OF AGE-ASSOCIATED HEARING IMPAIRMENT IN ELDERLY PATIENTS

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Introduction. Age-associated hearing impairment is based on dystrophic and atrophic changes from the auditory analyzer that decrease in sensory cells and neurons in the spiral organ and cochlea. Changes are necrosis of the nuclei, reducing bundles and fibers in the centers and conductive pathways up to the auditory zone of the cortex. From apparatus: rigidity of the main lamina, stiffness of the joints of the auditory ossicles due to increased viscosity of the synovial fluid, atrophy of ligaments and muscle mass reductions are noted. This affects the quality of life, cause loneliness, depression, slowing down the dynamics of mental activity, deterioration of memory and attention.

Aim of the study. To improve the efficiency of hearing impairment by using the Petralex software

Materials and methods. The specialists from the "BSUIR" and "GrSMU" developed and used the "Petralex" software within their agreement.

Modern smartphones have an audio subsystem generating sound signals at a discretion rate of 44.1 kHz, which has tone audiometry tests on it. Equipment testing is conducted with ordinary headphones based on the average hearing threshold. A calibration is performed by the hearing thresholds of ten healthy young people with good hearing by using specific phones and headphones and obtained "average threshold of hearing". After explaining the procedure, with the consent for screening, the study involved with elderly people aged 60 to 75 years. The subject wore headphones and sound signals were alternately transmitted to the right and left ears at different frequencies with increasing amplitude: 125, 250, 500, 1000, 2000, 3000, 4000 and 8000 Hz. When a person heard a sound signal, he pressed on the phone screen. All the results, the full name and age were saved on the phone. After passing the test, a tone audiogram for both ears appeared on the screen for further evaluation.

Results and discussion. For the period from 15.02.2024 to 01.03.2024, 33 studies were performed. As a result, 16 people with suspected pathology of the auditory analyzer were identified. Of these, 12 people suffer from hearing impairment in both ears, hearing impairment in the right ear – 3 people, and hearing impairment in the left ear – 1 person. The overall percentage of elderly people with suspected hearing pathology is 48%. After passing the study, 16 people with suspected hearing pathology were recommended to undergo an in-depth audiological examination by an audiologist, which was performed by 4 people, who revealed the pathology of the auditory analyzer

Conclusion. Effective way to detect the pathology of the auditory analyzer. The noted advantages are: accessibility, convenience, affordability, easy and unattended app setup can be used without the help of a technician in automatic mode.

EFFECTIVE COMMUNICATION IN THE CONTEXT OF DOCTOR-PATIENT RELATIONSHIPS (FROM THE PERSPECTIVE OF FOREIGN MEDICAL STUDENTS)

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Introduction. Effective communication is an essential element for the establishment and maintenance of healthy doctor-patient relationships. The importance of this study lies in addressing the societal demand for practice-oriented medical education, particularly for foreign medical students who will return to their home countries to practice medicine after completing their studies.

Aim of the study. The primary aim of this study is to identify the features of effective communication in doctor-patient relationships from the perspective

of foreign medical students. By examining communication models and their applicability, the study seeks to uncover the essential elements that contribute to successful interactions between doctors and patients. Insights from this research will benefit participants and provide valuable knowledge for future medical professionals and educators.

Materials and methods. Employing a mixed-method approach, this research combines quantitative and qualitative data collection. A questionnaire survey with 18 questions was administered to 302 international students from the 1st to 4th years of study across seven countries, with a significant representation from Sri Lanka. The survey was conducted using Google Forms for accessibility and convenience. Additionally, a comparative analysis of literature sources was performed to deepen the understanding of the problem and establish a theoretical foundation for the research.

Results and discussion.

Doctor-Patient Relationship Models:

1. **Paternalistic**: Doctor makes decisions for Patient.
2. **Informational**: Doctor provides information; Patient makes choices.
3. **Interpretative**: Doctor helps Patient understand his/her condition.
4. **Deliberative**: Doctor and Patient make decisions collaboratively.

Communication Elements:

- **Empathy**: Builds trust and understanding.
- **Trust**: Essential for healthy relationships.
- **Professional Boundaries**: Respecting privacy and maintaining detachment.
- **Informed Consent**: Providing necessary information for decisions.
- **Non-verbal Communication**: Gestures, expressions, and body language.

Foreign Students' Opinions:

- **Knowledge**: 61.3% know the models; 21% know all, and 28% know only one.
- **Preferred Models**: Interpretative and informational models align with their values.
- **Barriers**: Language barriers, medical terminology, lack of empathy, anxiety, and trust issues.

Key Relationship Elements:

- **Effective Communication**: Clear, empathetic exchanges.
- **Informed Consent**: Ensuring autonomy in decision-making.
- **Trust**: Building and maintaining trust.
- **Empathy**: Understanding and addressing concerns.
- **Professional Boundaries**: Ensuring a healthy relationship.

Skills Needed:

- **Doctors**: Active listening, clear speech, empathy, non-verbal communication.
- **Patients**: Honesty, clear descriptions, active listening, non-verbal communication.
- Most respondents (89%) agree on active participation from both parties.

Belarus' constitution emphasizes patient involvement in healthcare.

Common Errors:

- **Lack of Empathy**: Failing to demonstrate empathy can lead to misunderstandings and distrust.
- **Failure to Listen Actively**: Not listening attentively can result in misdiagnosis and inadequate treatment.
- **Use of Medical Jargon**: Complex terminology can confuse patients, hindering communication.
- **Unclear Explanations**: Providing unclear information about treatments can lead to dissatisfaction.
- **Insufficient Information**: Failing to provide enough information can undermine patient autonomy.

Non-verbal Communication:

- **Facial Expression**: Should convey empathy, attention, and confidence.
- **Body Language**: Open and relaxed body language builds rapport and trust.
- **Distance**: Maintaining an optimal distance of 50 to 120 cm during consultations fosters a comfortable environment.

Conclusion. In summary, this study underscores the importance of effective communication in the context of doctor-patient relationships. By understanding the perspectives of foreign medical students and identifying the key elements and barriers, the research provides valuable insights for enhancing communication in healthcare settings. The findings emphasize the need for practice-oriented medical education that addresses the diverse needs of patients and prepares future doctors for successful interactions in various cultural contexts.

EDUCATIONAL AND PRACTICAL SOFTWARE SIMULATOR FOR TEACHING CLINICAL THINKING

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Introduction. Clinical reasoning is essential for minimizing medical errors but is rarely taught as a separate discipline. Even when included, its teaching lacks structure. WHO reports 8-12% of EU hospitalizations involve errors. Developing clinical reasoning requires knowledge, experience, and qualities like empathy and intuition. Effective training involves analyzing data, making diagnoses, and creating treatment plans. At Privolzhskiy Research Medical University, clinical reasoning is taught using the Body Interact system, a virtual simulator that develops diagnostic skills. It provides real-time feedback and simulates disease scenarios. However, it requires specialized equipment, stable internet, and significant investment. Technologies like Body Interact and DID-

ACT enhance education but need adaptation to local standards.

Aim of the study. The goal is to create a program that simulates clinical cases with varied options based on the physician's actions, reflecting real-life situations and evaluating decisions.

Materials and methods. The code was developed using Python, ensuring high performance, unlimited script support, and suitability for remote self-monitoring without special device specifications or internet access.

Results and discussion. The code-trainer simulates situational tasks and evaluates physician actions. It features an intuitive interface for quick access to patient information and tests. Students select options, progressing step by step. Not all options are necessary for diagnosis, prompting learners to analyze and select key tests, influencing the final evaluation. Example code part:

def menu(): print("Select: necessary examination : 1, tactics : 2, Enter answer:") otv1=input () if otv1=="1": variant1=("Select an action: " "Assessment of consciousness-1 " "Respiratory examination-2 " "Menu-7")

Conclusion. The program helps students develop clinical reasoning, analyze data, and make informed decisions. It immerses them in clinical situations, providing safe training without risk to real patients.

PREVENTION AND TREATMENT OF RADIO-INDUCED ESOPHAGITIS DURING LUNG CANCER TREATMENT

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Introduction. Radio-induced esophagitis is a common complication associated with radiotherapy of lungs due to exposure of mediastinum, which leads to activation of key inflammatory mediators of m-RNAs like IL-1, TNF-alpha and IFN-gamma triggering apoptosis, DNA alterations, and mucosal disruption. Based on the time of onset, it presents as acute (within 3 months of treatment) or late (after 3months, occasionally up to a year). Effective management is critical for maintaining quality of life of patients.

Aim of the study. To evaluate methods of preventing and treating radiation-induced esophagitis in patients undergoing radiotherapy for lung cancer.

Materials and methods. Study of 15 male patients with an average of 66.3 years, diagnosed with Non-Small Cell Lung Cancer (NSCLC) were treated with Volumetric Modulated Arc Therapy (VMAT) from March to September 2024 at Grodno City Clinic Hospital No.3. Treatment regimens were different in tumor location, stage and comorbidities. Seven patients received classical fractionation, while five patients have undergone hypofractionated regimens due to their significant comorbidities. Radiation doses varied from 60 Gy to 66 Gy.

Results and discussion. Despite preventive treatments including Proton Pump Inhibitors (Esomeprazole) H2 Receptor Blockers (Ranitidine) and Antacids (Almagel A) all patients developed esophagitis up to some extent. Esomeprazole was administered together with Almagel A for patients with RTOG grade 1, 2 and 3. For RTOG grade 3 patients, Ranitidine, Almagel A and Local analgesic (Lidocaine) were administered intravenously and as oral suspensions respectively.

International studies have revealed various pharmacological agents for prevention and treatment of radio-induced esophagitis. Study from Japan explored that Polapreznic combined with Sodium Alginate and Aluminium-Magnesium Hydroxide have significantly reduced the progression of grade 2 or higher esophagitis according to (CTCAE) grading. In Canada, a research of Amifostine and Glutamine has been proven to be effective in prevention of progression of esophagitis in some patients. Similar study of Spain also demonstrated the efficacy of Glutamine upon radio-induced esophagitis. According to China, upon treatment with Granulocyte-Macrophage Colony Stimulating Factor (GM-CSF) patients improved to grade 1 and 2 from grade 3 esophagitis and total effectiveness revealed as 90.32%.

Additionally, herbal medications like Baimudan root and Epigallocatechin-3-gallate (EGCG) from green tea have been studied to reduce esophagitis during and after treatment, acting as an alternative to conventional treatments.

For pain management during the procedure, Topical Analgesics like oral viscous Lidocaine for mild and moderate pain and Opioid analgesics like Morphine is used intravenously or subcutaneously for severe pain.

Conclusion. Despite using Proton Pump Inhibitors and antacids from the start of radiotherapy, all patients developed varying degrees of esophagitis. With central tumors experienced in more severe cases, and symptoms worsened with comorbidities like atelectasis. Esophagitis typically began after a median dose of 18-21 Gy. Although no single treatment is universally effective, studies on agents like Glutamine, GM-CSF, and Polaprezinc together with Analgesics and some Herbal medicine show promise in reducing the severity of esophagitis.

ASSESSING DIABETES RISK FACTORS AMONG SRI LANKAN STUDENTS IN GRODNO STATE MEDICAL UNIVERSITY, BELARUS: INSIGHTS FROM A SURVEY STUDY

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Introduction. Diabetes Mellitus (DM) is a state of hyperglycemia in either fasting or postprandial states. In 2011, the International Diabetes Federation (IDF) estimated an overall prevalence of DM at 366 million; projecting 552

million by 2030. DM has proven a significant public health challenge worldwide, with increasing prevalence particularly noted in developing countries. Developing targeted interventions that promote healthy lifestyles which reduce the burden of diabetes, requires knowledge of its risk factors.

Aim of the study. As an increasing incidence has been recorded among Sri Lankan youth, this study assesses the prevalence of diabetes risk factors among Sri Lankan students studying at the Grodno State Medical University in Belarus; evaluating key factors including age, Body Mass Index (BMI), lifestyle (physical activity levels and unhealthy habits), diets, underlying health conditions and family histories, thereby providing valuable insights to develop targeted health interventions and enhance awareness and prevention strategies within this population.

Materials and methods. 245 participants aged 18-29 completed a structured questionnaire assessing diabetes risk factors. The survey was distributed electronically via Google Forms, ensuring convenience, and informed consent was obtained beforehand to maintain ethical standards. The study recorded age and calculated BMI to classify participants as underweight, normal weight, overweight or obese. Physical activity was evaluated according to the World Health Organization's 2020 guidelines on physical activity and sedentary behavior. Smoking, alcohol consumption, and dietary patterns were also assessed. Pre-existing health conditions and family history of diabetes were also considered. Descriptive statistics were used to summarize participant demographics and the prevalence of risk factors.

Results and discussion. The study population predominantly comprised females (68.1%) and males (the remaining 31.9%). In terms of BMI, 62.86% of students were classified as normal weight, 13.06% underweight, 19.59% overweight and 4.49% obese. Physical activity levels varied, with 20.3% identified as sedentary, 43.8% engaging in moderate activity, 12.4% participating in vigorous exercise, and 23.5% using a combination of activity levels. Health conditions among the participants included 1.63% (4) with high blood pressure, 4.48% (11) with sleep disorders and 5.3% (13) with hormonal disorders. Smoking or vaping was recorded at 9.2%, while alcohol consumption was a staggering 73.7%. Among drinkers, 10.2% did so weekly, 16.3% monthly, and 72.4% reported drinking rarely. Regarding dietary habits, 93.6% reported no dietary restrictions. Fruit and vegetable consumption however, was infrequent, with 21.5% rarely consuming them, 61.8% sometimes, 14.7% often, and only 2% very often. Sugary food intake varied, with 17.9% rarely consuming them, 45.4% occasionally, 25.5% regularly, and 11.2% daily. Whole grains were more commonly eaten, with 53.4% consuming daily, while 3.6% consumed rarely. Meal frequency indicated that 55.8% had fewer than three meals a day, 40.2% had three meals, 3.2% had four to five meals, and only 0.8% reported more than five meals. Snacking habits varied as well, with 35.9% rarely snacking, 40.2% occasionally, 16.3% regularly and 7.6% daily.

Additionally, 59% of participants reported a family history of diabetes, while 35.5% did not and 5.6% were unsure. Among those with a family history,

80.7% had relatives with type 2 and 15.3% with type 1 diabetes. Furthermore, 51.4% reported a family history of hypertension or high cholesterol, but only five individuals indicated that family members had undergone genetic testing for diabetes.

Conclusion. In conclusion, a considerable proportion of students present multiple risk factors associated with diabetes. While the presence of these risk factors does not imply an inevitable progression to diabetes, it underscores the importance of increased awareness and proactive health management among the student population.

DECODING MULTIPLE MYELOMA: A RETROSPECTIVE CASE STUDY

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Introduction. Multiple myeloma (MM) is a malignancy of hematological origin characterized by the clonal proliferation of cancerous plasma cells in the bone marrow. It presents with a constellation of symptoms and laboratory abnormalities, including anemia, renal dysfunction, hypercalcemia, and bone lesions (CRAB criteria).

This case report highlights the diagnostic challenges and complexities in managing a 66-year-old female patient with multiple comorbidities including Chronic Kidney Disease (CKD) stage 2, Type 2 Diabetes Mellitus (DM) and Arterial hypertension, complicated by nephropathy, anemia, and elevated Erythrocyte Sedimentation Rate (ESR), ultimately diagnosed with MM.

Aim of the study. This study is unique due to the atypical presentation of MM in a patient with well-controlled diabetes mellitus and CKD, emphasizing the diagnostic dilemmas met in distinguishing MM-related kidney damage from diabetic nephropathy. Such cases showcasing the coexistence of MM and preexisting CKD are rare, underscoring the need for thorough investigation of symptoms in patients with overlapping chronic conditions.

Materials and methods. A 66-year-old woman with CKD stage 2 was admitted with complaints of lower extremity edema constant for about 1.5 months, fatigue, exertional dyspnea and significant fluctuations in her laboratory markers. These fluctuations started 1 year ago and were treated on an outpatient basis. The patient has a history of Type 2 Diabetes Mellitus, Arterial Hypertension. The patient has no relevant psychosocial or family history for oncological diseases.

After evaluating the patient, pitting edema of the shins was noted. The rest of the examination revealed no noteworthy findings. Fluctuated laboratory

markers included proteinuria, mild normocytic hypochromic anemia, increased ESR and decreased total protein.

The diagnosis upon admission was chronic tubulointerstitial nephritis due to the preexisting nephropathy of combined genesis (DM, Arterial Hypertension). The patient's hypertension was effectively managed and within normal limits. She also had good glycemic control (7%), but the level of proteinuria (2.1 g/l) was not consistent with this range of HbA1c, so alternative diagnoses were considered. After consultation with a hematologist, she was recommended to undergo sternal puncture, which revealed changes consistent with diffuse-focal form of Multiple Myeloma stage 2.

The patient was recommended Bortezomib 1.75mg and Cyclophosphamide 200mg, Dexamethasone 20mg, which is the standard treatment regimen for MM.

Results and discussion. Multiple myeloma and CKD are 2 diagnoses that have overlapping symptoms.

Mild anemia presenting in this patient projected many red flags that prompted the need for a hematological investigation. Firstly, the anemia is disproportionate to the stage of CKD; for a patient in CKD stage 2, normocytic hypochromic anemia would be atypical, as this often presents at much later stages of CKD due to erythropoietin deficiency.

Additionally, elevated ESR and as well as the aforementioned proteinuria point to a systemic process beyond diabetic nephropathy or heart failure. The triad of anemia, renal involvement and increased ESR justified the need to rule out hematological malignancies, hence a bone marrow biopsy was undertaken.

The majority of existing studies mostly focus on MM-induced kidney damage and don't address the fact that several symptoms are shared between the two diseases that could lead to a misdiagnosis. Further studies should be done examining the relationship between these two conditions. Recent guidelines (KDIGO, IMWG) encourage considering the possibility of MM in patients presenting with Acute Kidney Injury of unknown origin, but broader CKD populations are still not addressed. It's important to note that a lack of awareness about the possibility of MM in a CKD patient could potentially have a fatal outcome.

Conclusion. Overall, this case report emphasizes the difficulties in diagnosing MM in patients that present a history of multiple comorbidities which have similar symptoms, especially in patients suffering from CKD. When a patient presents with unexplained anemia, increased ESR and proteinuria, it's always important to consider a possible MM diagnosis, especially if the patient is over the age of 65. The rapid diagnosis of such patients allows healthcare providers to offer better treatment modalities leading to lower rates in mortality and better outcomes for the patient, as depicted in this case report. This report also serves to demonstrate the importance of thoroughly investigating patients with multiple comorbidities and complex medical histories.

COMMON MENSTRUAL DISTURBANCES AMONG YOUNG FEMALE ADULTS

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Introduction. Menstrual disturbances can have a huge impact on a woman's day-to-day life activities, physical health, mental health and her spiritual well-being also. This research is mainly focused on the young female adults aged between 18 - 35 years to identify the menstrual disturbances and to pay necessary attention.

Aim of the study. To analyze menstrual cycle disorders in women aged 18-35 years.

Materials and methods. Our study recruited women aged 18 to 35. Participants were asked to complete detailed questionnaires covering sociodemographic information and potential risk factors.

Results and discussion. According to the collected data 13.5% females have irregular menstruation. The rest 86.5% has regular menstrual cycle. Out of all the responses 3.8% are suffering from menorrhagia (more than 7 days). But 90.3% have normal menstruation. Intermenstrual bleeding is in 13.5%. Dysmenorrhea can be seen in 91.9%. Only 18.6% is having severe pain according to the pain scale (8-10). Pain before the menstruation occurs in 35.3%. The majority, which is 90%, have pain during the menstruation, while 4.7% has pain even after the menstruation stops. Among the given population 54.6% has diarrhea / constipation. 83.2%, which is the majority, has abdominal cramps and lower back pain. Frequency of urination in 20% and 65.4% has body weakness. 64.9% and 9.7% have acne and unusual hair growth in face / chest respectively. 67.9% has mood swings during menstruation. 44.9% has breast pain and 25.9% has sleep changes. 38.9% and 10.3% have headache and hair loss respectively. Nipple discharge is in 2.2%. Although most of the women have different menstrual disturbances, only 10.8% of them have medically diagnosed their conditions, which are PCOS, fibroid and endometrial hyperplasia. 8.3% has thyroid hormone imbalances and 0.9% has pituitary related problems. 11.1% has anemia. 2.7% has been pregnant, but the majority have not experienced. 2.2% has had difficulties in getting pregnant, which can be subfertility. 8.1% has used COCP/ POP, while 0.5% uses Nexplanon / depo Provera. Dyspareunia is showing in 6.5% of women and 1.1% has bleeding during sexual intercourse.

Conclusion. This study highlights common menstrual issues in women aged 18-35, including PCOS, fibroids, and symptoms like dysmenorrhea and menorrhagia. Given the high occurrence, medical attention is crucial for maintaining an active life during menstruation.

GENDER DIFFERENCES IN PATIENTS WITH ATRIAL FIBRILLATION

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Introduction. The most common and persistent arrhythmia today is atrial fibrillation (AF). There is conflicting data, as to whether or not gender plays a role in the association of various risk factors and the development of AF. There are many gaps in our knowledge of the gender differences in AF, and many opportunities for future research.

Aim of the study. To evaluate clinical and laboratory differences in male and female patients with AF.

Materials and methods. The study included 90 patients with persistent and paroxysmal form of non-valvular AF, who were admitted to Grodno State Cardiological Center for treatment from January to December 2024. Group 1 included 44 male patients, while Group 2 included 46 female patients. All patients underwent clinical and laboratory studies. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Male patients with AF were younger than females (61 [55; 70] vs 68 [63; 75] years, p=0.001) and had slightly lower, however insignificantly, body mass index (29 [25; 33] vs 31 [26; 36], p>0.05). More than a half of patients in each group had obesity (52% vs 58%, p>0.05). Also, patients of both groups were comparable in prevalence of coronary artery disease, stable angina and diabetes mellitus (p>0.05). Female patients were more likely to have hypertension (100% vs 79%, p=0.02) than male patients, however there were no significant differences in stages of hypertension and heart failure NYHA functional class (p>0.05).

In biochemical blood test male patients had higher levels of creatinine (93 [79; 102] vs 79 [68; 90] μmol/L, p=0.01) and lower eGFR (79 [69; 93] vs 68 [58; 75] ml/min/1.73m2, p=0.001) than females, however their urea levels were comparable (7.9 [4.8; 7.1] vs 5.9 [4.5; 7.3] mmol/L, p=0.29). There were no intergroup differences in values of total cholesterol (p=0.92), glucose (p=0.17) and sodium (p=0.14), however potassium levels were lower in females (4.4 [4.1; 4.8] vs 4.7 [4.4; 5.0] mEq/L, p=0.004).

Conclusion. Female patients with AF were older and more prone to hypertension, while both groups demonstrated high percent of comorbidities, such as coronary artery disease, obesity and diabetes. Male patients had significantly lower levels of renal function parameters; and female patients had a tendency to electrolyte imbalance.

PSYCHOLOGICAL HEALTH AND MOTIVATION FOR THE PROFESSION OF MEDICAL STUDENTS OF DIFFERENT YEARS OF STUDIES

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Introduction. Maintaining students' psychological health and motivation for the profession is one of the important tasks of the medical university.

Aim of the study. To determine the state of psychological health of medical university students in various years of studies in relation to the type of motivation for professional activity

Materials and methods. A voluntary survey of 95 students of the Yaroslavl State Medical University (YSMU) of the 2nd, 3rd and 5th year of studies was conducted. The type of motivation for the profession was determined using the method of T.O. Gordeeva, the spectrum of mental health using the method of K. Keys in the adaptation of E.N. Osin, as well as the levels of anxiety and depression using the hospital anxiety and depression scale HADS (Zigmond AS, Snaith RP). The students were divided into three groups depending on the identified type of motivation for the profession: the first consisted of 74 people (78%) with intrinsic motivation, the second - 11 people (12%) with extrinsic motivation, and the third - 10 students (10%) with demotivation. Statistical data processing was performed using Microsoft Excel 2016.

Results and discussion. Significant differences were found between the groups in the indicators of the year of studies, the spectrum of mental health, anxiety and depression. Thus, in the 1st group of students, the indicator of the course of study was 3.1 ± 0.1, in the second - 3.3 ± 0.3, and in the third - 4.2 ± 0.3 ($p < 0.05$ between the 1st and 3rd groups). The indicator of mental health (emotional well-being) in the 1st group of students was 11.0 ± 0.3 points ($p < 0.05$ in comparison with the 2nd and 3rd groups), in the 2nd - 9.1 ± 1.1 points, and in the 3rd - 8.8 ± 0.6 points. The anxiety level in the 1st group was 7.0 ± 0.4 points ($p < 0.05$ compared to the 2nd and 3rd groups), in the 2nd - 9.7 ± 1.2 points, and in the 3rd - 9.9 ± 1.5 points. The depression level in the 1st group was 4.1 ± 0.4 points ($p < 0.05$ between the 1st and 3rd groups), in the 2nd - 6.1 ± 1.2 points, and in the 3rd - 6.5 ± 0.7 points. Thus, the majority of first-year students maintain satisfactory psychological health and high motivation for the profession, but 10% of senior students experience deterioration in psychological health in the form of a decrease in the emotional well-being indicator, the appearance of signs of subclinical anxiety and depression, along with which the motivation for the

medical profession decreases.

Conclusion. 90% of students maintain psychological health and high motivation for the medical profession during their studies at the medical university. In 10% of students, by the senior years of study, there is deterioration in psychological health and decrease in motivation for the profession, which requires the development of preventive measures to identify risk groups and increase motivation for the medical profession.

ANALYSIS OF BIOMARKERS OF ENDOMETRIOSIS BEFORE AND AFTER LAPAROSCOPIC CYSTECTOMY OF OVARIAN ENDOMETRIOMA

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Introduction. Endometriosis is one of the most common gynaecological diseases among women of reproductive age. The pathogenesis is described by the implantation and growth of tissue, which represents the endometrial glands outside of the uterine cavity including the ovaries. Ovarian endometriomas are benign ovarian cysts that occur in 17-44% of patients with endometriosis. Endometriomas have a strong impact on women's fertility, psychological and social aspects.

The diagnosis of endometriosis is relatively problematic. Transvaginal and transabdominal ultrasound scans and MRI imaging are useful in detecting endometriomas. A relatively specific test used to diagnose endometriosis is the serum CA-125 level. HE4 (Human Epididymis Protein 4) is another biomarker used in conjugation with CA-125. The ROMA index is used to differentiate endometriosis from EOC (Epithelial Ovarian Cancer) most accurately.

Laparoscopic cystectomy using the strip method is the gold standard investigation and treatment method of endometriosis and endometriomas. The effectiveness of the laparoscopic cystectomy and the patient's recovery can be assessed by analyzing the above-mentioned biomarkers in blood. CA-125 is often reduced post operatively indicating reduction in disease activity. Further regular assessment of these biomarkers can help in monitoring the recovery and detection of potential complications and recurrence.

Aim of the study. To analyze the biomarkers of endometriosis in patients with ovarian endometriomas before and after laparoscopic cystectomy.

Materials and methods. For this statistical research details of 30 patients who were consulted at the consultation centre of Women's Health Clinic in Grodno, Belarus were selected. The data was obtained from a computerized database in the clinic. The inclusion criteria were: women aged between 18-40

years, who have undergone laparoscopic cystectomy for ovarian endometriomas. The absolute values of CA-125, HE4, and ROMA index were calculated before and after laparoscopic cystectomy.

Results and discussion.

- From the 30 patients, the percentage variation of the CA-125 was analyzed. The results depicted that the CA-125 level is decreased after the surgery. In 13% of the patients the CA-125 is reduced by 0-24.99% after the surgery, in 47% of the patients the CA-125 is reduced by 50-74.99% and in 23% of the patients the CA-125 is reduced by more than 75% after the surgery. In 17% of patients CA-125 level is increased after the surgery.
- The percentage variation of the HE4 was also calculated. In 33% of the patients the HE4 is reduced by 0-24.99% after the surgery, in 50% of the patients the HE4 is reduced by 25-49.99% after the surgery and in 7% of the patients the HE4 is reduced by 50-74.99%. The HE4 is increased after the surgery in 10% of patients.
- Further, the percentage variation of the ROMA index was analyzed. According to the results, in 17% of the patients the ROMA index is reduced by 0-24.99% after the surgery, in 20% of the patients the ROMA index is reduced by 25-49.99% after the surgery, in 43% of the patients the ROMA index is reduced by 50-74.99% and in 10% of the patients the ROMA index is reduced by more than 75% after the surgery. The ROMA index is increased after the surgery in 10% of patients.

Conclusion.

- In 87% of the patients the CA-125 is reduced after the surgery.
- In 90% of the patients the HE4 is reduced after the surgery. In 90% of patients the ROMA index is reduced after the surgery.
- The most sensitive biomarker is CA-125.

UNDERSTANDING BRAIN CHANGES IN HALLERVORDEN-SPATZ DISEASE (HSD) THROUGH MRI

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Introduction. Hallervorden-Spatz disease (HSD), also known as Pantothenate Kinase-Associated Neurodegeneration (PKAN), is a rare neurodegenerative disorder characterized by movement problems and cognitive decline due to iron buildup in the brain. Diagnosing HSD can be challenging as its symptoms resemble other neurological conditions. MRI is a crucial tool for detecting HSD, particularly through the Eye-of-the-Tiger sign. This study aims to explore how advanced MRI techniques, such as SWI, QSM, and DTI, can enhance the understanding, diagnosis, and monitoring of HSD by correlating MRI findings with clinical symptoms and disease progression.

Aim of the study. The aim of the study is to analyze MRI findings in Hallervorden-Spatz disease (HSD), focusing on how they relate to symptom severity and disease progression. The study explores the role of advanced MRI techniques, such as SWI and QSM, in improving early diagnosis, monitoring disease progression, and potentially serving as biomarkers for treatment evaluation.

Materials and methods.

- **Study Approach**:
  - Reviewing MRI scans from HSD patients and comparing with healthy individuals and those with other neurological conditions.
- **Data Collection**:
  - MRI scans were obtained from hospital records, neuroimaging databases, and published case studies.
- **MRI Techniques Used**:
  - **T2-Weighted MRI**: To detect the **Eye-of-the-Tiger sign**.
  - **T1-Weighted MRI**: To visualize iron accumulation.
  - **SWI and QSM**: To provide detailed images of iron deposits and track disease progression.
- **Data Analysis**:
  - Focusing on identifying brain damage patterns and comparing MRI findings with symptoms. Evaluating the effectiveness of advanced imaging techniques.

Results and discussion.

- **Key MRI Findings in HSD**:
  - The **Eye-of-the-Tiger sign** is found in nearly all patients, making it a key diagnostic marker.
  - **T2 Hyperintensity (Dark Areas)** indicates excessive iron buildup, linked to movement problems.
  - **T1 Hyperintensity (Bright Areas)**, seen in severe cases, suggests widespread brain damage.
- **Relation of MRI Findings to Symptoms**:
  - **Severe T2 hyperintensity** is associated with **worse motor symptoms** like stiffness and walking difficulties.
  - **Milder Eye-of-the-Tiger signs** suggest **early disease**, with fewer symptoms.
  - **Advanced imaging** (**SWI, QSM**) detects **more iron buildup** in severe cases, linking iron accumulation to disease progression.
- **Advanced MRI Techniques**:
  - **SWI and QSM** offer clearer views of iron buildup, aiding in disease tracking.
  - **DTI** shows **early white matter damage**, useful for early detection.
  - **fMRI** highlights altered brain activity, explaining **cognitive and speech issues** in some patients.
- **Future Research Implications**:
  - MRI remains the **best tool** for diagnosing and monitoring HSD.

- The severity of MRI findings correlates with symptom severity, helping track progression.
- Future advancements, including **AI-powered MRI** and **genetic testing**, could improve early diagnosis and personalized treatments, offering hope for better management and potential treatments.

Conclusion. MRI plays a pivotal role in the diagnosis and monitoring of Hallervorden-Spatz disease (HSD), with the **Eye-of-the-Tiger sign** being a key diagnostic marker. Advanced imaging techniques, including **SWI**, **QSM**, and **DTI**, offer deeper insights into iron accumulation, brain damage, and early disease progression. These techniques not only help in diagnosing HSD, but also provide valuable information for predicting disease severity and tracking progression over time. As the field evolves, future advancements like **AI-based MRI analysis** and **genetic testing** could enable earlier detection, more personalized treatments, and improved symptom management. Although a cure is not yet available, these innovations offer significant hope for better outcomes in the management and treatment of HSD.

PERSONALIZED MANAGEMENT IN ISCHEMIC STROKE: A CASE - BASED ANALYSIS

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Introduction. Ischemic stroke occurs when a blocked cerebral artery reduces blood flow, causing neurological deficits like weakness, speech impairment, and vision changes. Major risk factors include hypertension, diabetes, and smoking. Diagnosis relies on imaging, with CT ruling out hemorrhage and MRI assessing infarcts. Treatment includes thrombolysis within 4.5 hours, mechanical thrombectomy for large occlusions, and long-term prevention with antiplatelets, statins, and lifestyle changes. However, management often requires individualized adjustments based on patient comorbidities and resource availability.

Aim of the study. This study aims to explore the significance of individualized management in ischemic stroke by analyzing cases, where standard treatment guidelines were modified based on patient-specific factors such as comorbidities, contraindications, and diagnostic limitations. While guidelines serve as a foundation for treatment, real-world scenarios often require clinicians to adapt their approach to avoid complications and improve patient outcomes. By examining these cases, we underscore the necessity of a flexible, patient-centered strategy in stroke management, especially in settings, where

diagnostic and therapeutic options may be limited, and where comorbidities and contraindications play a crucial role in treatment decisions.

Materials and methods. This study analyzed 2023 patient case reports from Grodno University Clinic, focusing on ischemic stroke symptoms, comorbidities, and treatment limitations. It highlights the need for individualized management based on patient-specific factors.

Results and discussion. Patient A had a mild cardioembolic stroke (NIHSS 5) with partial sensory aphasia and pyramidal insufficiency. Management included aspirin, antihypertensives, and rehabilitation. Anticoagulation was considered based on further evaluation. Patient B had a moderate atherothrombotic stroke (NIHSS 8) with left-sided hemiparesis, severe comorbidities (CAD, CHF, diabetes, obesity), and ocular artery stenosis. Antiplatelet therapy (clopidogrel), statins, antihypertensives, and neuroprotection were initiated. Rehabilitation focused on functional recovery. Patient C had moderate hemiparesis (NIHSS 5-8) with ICA occlusion, atherothrombotic infarction, and cardiovascular comorbidities. Management included clopidogrel, statins, heart rate control, and antihypertensives. Carotid stenting was considered based on further imaging. Patient D had a severe infarction (NIHSS 15) with hemorrhagic transformation, respiratory distress, and critical ICA stenosis. Treatment involved neuroprotection, anticoagulation, BP control, and infection management. Close neurological monitoring was essential. Patient E had worsening ischemia with carotid and iliac artery stenosis, coronary disease, and severe pneumonia. Antithrombotic therapy, respiratory support, and potential neurosurgical intervention were planned.

Conclusion. The management of ischemic patients, particularly those with cerebral infarctions, necessitates a comprehensive approach involving multidisciplinary collaboration. Key symptoms include neurological deficits, such as hemiparesis and dysarthria, respiratory complications like pneumonia, and cardiovascular issues, including coronary heart disease and hypertension. Imaging studies, particularly CT scans, reveal significant ischemic changes, guiding treatment decisions. Initial management focuses on pharmacological interventions, including antiplatelet therapy (e.g., Clopidogrel), antihypertensives (e.g., Lisinopril), and lipid-lowering agents (e.g., Atorvastatin). Supportive care is vital, providing respiratory assistance and nutritional support while monitoring vital signs and neurological status. Rehabilitation is initiated early, addressing motor and speech deficits through physical and occupational therapies. Regular assessments ensure timely adjustments to the treatment plan, optimizing recovery and minimizing complications. Potential complications include increased intracranial pressure, respiratory failure, and thromboembolic events, necessitating vigilant monitoring. Ultimately, the treatment goals are to stabilize neurological status, manage blood pressure, prevent complications, and enhance functional recovery through coordinated care. Ongoing follow-ups and interdisciplinary communication are essential for improving patient outcomes and quality of life.

THE RELATIONSHIP BETWEEN THE CARDIOPULMONARY SYSTEMS IN PNEUMONIA PATIENTS WITH MAGNESIUM DEFICIENCY

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Introduction. Pneumonia, although confined as an acute infection of the lung, has various ways, in which it can cause or worsen cardiovascular complications. Studies of the relationship between magnesium deficiency and pneumonia are scarce. However, some researchers have noted a link between magnesium deficiency and systemic inflammatory response.

Aim of the study. To establish a relationship between cardiovascular and pulmonary systems in patients with community-acquired pneumonia with the presence of manifestations of magnesium deficiency.

Materials and methods. A comprehensive analysis involving 102 patients with community-acquired pneumonia (mean age – 30.5±8.6 years) was conducted at the State Healthcare Institution "City Clinical Hospital N2 of Grodno". The patients were divided into 2 groups by gender: Group 1 – male (34) and Group 2 – female (68). The groups were comparable by age. All patients were examined according to the diagnostic and treatment protocols of the Ministry of Healthcare of the Republic of Belarus.

The following indexes were calculated to establish a relationship between the cardiac and pulmonary systems: The Hildebrandt index, to assess intersystem interactions in the cardiorespiratory system (N= 2.8-4.9).The Robinson index, to assess the level of metabolic and energy processes in the body, which can be interpreted as: up to 70 – high, from 70 to 85 – above average, from 85 to 95 – average, from 95 to 110 – below average and from 110 – low. The Kerdo index, to determine the tone of the autonomic nervous system, where, at values > 0.1 – shows prevalence of sympathetic tone, values from 0.1 to + 0.1 balanced autonomic system, at values < – 0.1 – predominance of parasympathetic tone.

The presence of magnesium deficiency manifestations was determined using a magnesium deficiency assessment test, a questionnaire tailored to evaluate possible magnesium deficiency, where higher scores indicated a pronounced deficiency.

The obtained data were processed using nonparametric statistical methods. The data in the work is presented as Me [25% and 75%]. The level was considered reliable at $p < 0.05$.

Results and discussion. The assessment test with a score of 10 [8; 12] indicated minor signs of magnesium deficiency in the patients. Magnesium deficiency was more common in females – 11 [9.5; 12], while in men the parameters were within the normal range – 8 [7; 10] ($p<0.05$). Upon analyzing

the impact of smoking on magnesium deficiency, no reliable differences were noted between patients, who smoke and those who do not. Nevertheless, it was found that male smokers had more signs of magnesium deficiency (9 [8; 11]) than male non-smokers (8 [6; 9]) ($p<0.05$). However, in females, signs of magnesium deficiency in smokers and non-smokers were expressed equally.

The Kerdo index indicated 58% of patients had a predominance of the sympathetic nervous system tone. Among the 2 groups, no significant differences in tone were observed, 56% of women and 62% of men had sympathetic nervous tone. Significant differences in the Hildebrandt index were also not obtained, 5.2 [4.2; 6.4] – in men and 4.7 [4.4; 5.6] – in women. However, it was within the normal range in 59% of women and only in 29% of men ($p<0.05$). Robinson index had significantly higher values in male patients (108 [95; 123]), compared to females (94 [83; 101]) ($p<0.05$).

When calculating the Spearman correlation coefficient, a positive medium-strength relationship was established between Hildebrandt index and Kerdo index ($r=0.44$) and Hildebrandt and Robinson index ($r=0.38$).

Conclusion. 1. The correlation of the Hildebrant index with the Robinson and Kerdo indexes can be attributed to a strong systemic inflammatory response produced by pneumonia, inducing a hypoperfusion state by the action of inflammatory cytokines and, C-reactive proteins, interleukins and tumor necrosis factor. The sympathetic tone activity may be described as an upregulation, a normal state during infections leading to tachycardia and high vascular resistance decreasing the cardiac output and coronary perfusion.

2. The results also postulate an association with magnesium deficiency and the cardiopulmonary system which can be caused by magnesium deficiency leading to a state of systemic inflammatory response; however, for further investigation serum magnesium levels are required.

3. Females having a higher magnesium deficit can be explained by biological, physiological and sociocultural factors; however, to justify this postulate serum magnesium levels are needed.

A COMPARATIVE STUDY ON THE PREVALENCE OF SCHOOL'S DISEASE BETWEEN FIRST AND FIFTH-YEAR UNIVERSITY STUDENTS

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Introduction. School's Disease [SD] is a collection of diseases that arise amongst the demographic of students engaged in academic activity for extended periods including myopia, scoliosis, obesity, gastritis, chronic illnesses and neurotic disorders.

Aim of the study. To do a comparative study on first and fifth-year

students to reveal a rise in prevalence of SD during the academic course.

Materials and methods. A cross-sectional study on 100 first year [1Y] [42 males and 58 females] and 100 fifth year [5Y] [32 males and 68 females] students from 8 universities was done using a tailored survey, which was carried out in the form of an online anonymous questionnaire producing two cohorts: 1Y and 5Y. The questionnaire was aimed at obtaining the prevalence of myopia, scoliosis, gastritis and chronic illnesses. Musculoskeletal health was assessed on exercise and posture. Screen time was assessed for myopia risk. Neurotic disorders were assessed by insomnia, irritability and mood lability. Obesity was evaluated using WHO BMI criteria.

Results and discussion. Chronic illness prevalence was 11% of 1Y vs. 21% in 5Y, distributed as 3% GI- tract, 5% eye and 3% respiratory related in 1Y, and 5% GI-tract, 9% eye and 7% respiratory related in 5Y.

In 1Y, only 54% used screens over 1 hour, while in 5Y, 86% exceeded 1 hour, which was distributed as follows where 39% used their computers for 1-3 hours, 13% up to 4-6 hours and only 2% used it over 7 hours in 1Y. However, in 5Y 36% used for 1-3 hours, 40% for 4-6 hours and 10% for over 7hours.

Proportion of students requiring corrective glasses was 56% and 58% in 1Y and 5Y years respectively. In both cohorts, 51.5% used glasses by first year. After 1st year, 11% of 5Y began using glasses. By the third year, there was a 23.4% rise in glasses use in 5Y.

The fraction of overweight students in 1Y was 12% vs. 19% in 5Y. Class I obesity in 1Y was 2% vs. 6% in 5Y.

Prevalence of scoliosis was 9% in 5Y vs. 0% in 1Y. Indicators of posture: 16% of 1Y and 13% of 5Y chose to study on their beds. 25% of 1Y and 16% of 5Y used ergonomic furniture. Morning exercises declined from 20% in 1Y to 10% in 5Y. In 5Y, 91% individuals engaged in moderate to heavy physical activity, compared to 88% in 1Y.

Gastritis prevalence was 27% at 1Y and 29% in 5Y.

Neuropsychic markers including insomnia rose from 10% in 1Y to 24% in 5Y. Mood swings increased from 43% to 51%, and irritability during stress affected 58% of 1Y and 65% of 5Y.

Conclusion. A direct correlation of prevalence of school's disease and the length of course of academic study at university can be established. All observed changes can be traced to the heightened exposure to risk factors that students face throughout their academic course, i.e. screen time, poor posture, poor diet, and submission to a sedentary lifestyle and stress. The results show that it is crucial to introduce preventative measures into early student life. For instance, taking short breaks every 20 minutes to look away from the screen to prevent eye strain, and limiting screen time may reduce the risk of myopia. Students should maintain proper posture while studying, such as sitting at a table in a comfortable chair instead of studying on a bed. Additionally, increasing physical activity is crucial for enhancing musculoskeletal and mental health. Following a balanced diet is also essential to mitigate the risk of future gastrointestinal disorders.

CONDITIONS THAT AFFECT THE EFFECTIVENESS OF MEDICAL TREATMENT IN PATIENTS WITH PSORIASIS

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Introduction. For patients with plaque-associated psoriasis, there is no one-size - fits-all solution when choosing and changing medication. Specialists who practice in this area face difficulties, since there is a number of factors that can worsen the course of the disease when using treatments with proven clinical effectiveness. In some cases, this can lead to increase in the severity and prevalence of the psoriatic process, the development of erythroderma, or resistance to therapy. It was analyzed how concomitant diagnoses and side effects from therapy affect the choice of treatment by doctors among patients who were treated in skin and venereal dispensaries of the Central Federal District in 2022-2023.

Aim of the study. To perform a pharmacoepidemiological evaluation of medication prescriptions and their usage quantities for the treatment of plaque psoriasis, utilizing frequency analysis and examination of average daily dosages during both outpatient and inpatient phases of treatment. To identify the factors that impact the success of pharmacotherapy for plaque psoriasis. Additionally, we identified the most common side effects and serious adverse reactions.

Materials and methods. A prospective, non-randomized, cross-sectional study of outpatient records and hospital discharge summaries of 336 patients with a diagnosis of plaque psoriasis was conducted from 2022 to 2023. Doctors then surveyed the patients about their adherence to treatment recommendations using a questionnaire on therapy compliance. The study examined the occurrence of complications related to the primary diagnosis, the presence of co-existing conditions, and the factors that influenced the prescription of pharmacological treatments for plaque psoriasis.

Results and discussion. The patients who were treated with methotrexate had a higher prevalence of comorbidities compared to those who received genetically engineered biological treatments ($p < 0.05$). The patients on methotrexate had a lower incidence of psoriatic arthritis, polyarthritis, spondyloarthritis, dactylitis, enthesitis, and psoriatic onychodystrophy compared to the group receiving genetically engineered biological treatments ($p < 0.05$). Multivariate analysis revealed that the severity of skin lesions with psoriatic rashes and patient adherence to treatment influenced the choice of therapy. We studied the results of comparative studies of various drugs, as well as information from the instructions for the use of systemic medications for the treatment of plaque psoriasis. There were no statistically significant differences in the incidence of the most common side effects between genetically

engineered drugs (p> 0.05), which was confirmed in several direct comparative clinical studies. Methotrexate showed a higher incidence of all the most common side effects compared to other genetically engineered drugs. In particular, it showed a higher incidence of side effects from the blood, nervous system, infectious diseases and liver.

Conclusion. Among patients who received genetically engineered medications, concomitant arthropathic complications were significantly more prevalent – in 32.5% of cases compared to 18.2% among those on methotrexate (p<0.05). Therefore, in most instances, the decision in favor of monoclonal antibodies is driven by the presence of arthropathic psoriatic manifestations in patients, the severity of cutaneous lesions, their younger and more active age, and their high adherence to innovative treatment prescribed by the physician (p<0.05).

ECHOCARDIOGRAGHIC DIFFERENCES IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION OF DIFFERENT ORIGIN

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Introduction. Heart failure (HF) is a clinical syndrome which occurs as a result of functional and structural abnormalities in filling or pumping out blood from the ventricles. Regardless of the advancement of medicine, HF remains a leading cause of cardiovascular morbidity and mortality. Heart failure with reduced ejection fraction (HFrEF) has a wide range of aetiologies, including myocardial infarction (MI), chronic ischemic heart disease, dilated cardiomyopathy and viral infections. It also includes other contributing factors, such as genetic predisposition, valvular heart disease and hypertension.

This study offers a detailed statistical assessment of echocardiographic features in patients with Heart Failure with reduced Ejection Fraction (HFrEF) of diverse origins. By analyzing these parameters, a deeper understanding of the HF subtypes and their pathophysiological bases can be understood, to help improve diagnosis and treatment in clinical settings.

Aim of the study. To identify echocardiographic features in patients with HFrEF of different origin.

Materials and methods. The study included 58 patients with HFrEF, who were admitted to Grodno State Cardiological Centre for treatment from January to September 2024. According to the origin of their heart failure, patients were divided into 2 groups. Group 1 included patients with dilated cardiomyopathy (n=32), and Group 2 included patients with ischemic cardiomyopathy (n=26).

The study did not include patients with hypertrophic cardiomyopathy,

arrhythmogenic right ventricular dysplasia, valvular heart disease, and verified hereditary channelopathies. The exclusion criterion was also the presence of indications for cardiac surgery (revascularization, correction of valve insufficiency).

All patients underwent clinical, laboratory, and instrumental studies, including transthoracic echocardiography and coronary angiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients of both groups were comparable in age and gender ($p>0.05$), with predominance of male gender. There were no significant intergroup differences in the prevalence of such co-morbidities as hypertension, obesity, prior stroke and diabetes mellitus ($p>0.05$). However, patients with dilated cardiomyopathy more often had atrial fibrillation in comparison with ischemic one (56% vs 15%, $p=0.01$). On the other hand, patients of Group 2 had higher prevalence of previous MI (65% vs 6.2%, $p<0.001$) and operation of coronary artery bypass graft (30.7% vs 3.1%, $p=0.02$) in comparison with Group 1. Patients of both groups had no difference in NYHA HF functional class ($p>0.05$).

Patients of both groups showed a significant increase in the linear and volumetric dimensions of the left ventricle and decrease in LVEF (38 [35; 42] vs 38 [31; 46] %, $p>0.05$). However, the studied groups differed in echocardiography parameters, characterizing atrial remodeling: diameter of left atrium was significantly higher in patients with dilated cardiomyopathy compared with ischemic one (48 [43; 51] vs 44 [41.5; 46] mm, $p=0.004$), as well as the diameter of the right atrium (44.9 [42; 48] vs 39.7 [36; 43] mm, $p<0.001$). Also, patients of Group 1 had larger size of right ventricle (30 [27.5; 33] vs 28 [25; 30] mm, $p=0.04$). No significant differences were found in other echocardiographic parameters.

Conclusion. Comparative analysis of echocardiography characteristics of patients with HFrEF of different origin showed that the patients of both groups had the same pattern of LV remodeling, associated with an increase in the left ventricle and the formation of systolic dysfunction. It was found that the linear and volumetric characteristics of the left and right atrium, as well as right ventricle of patients with dilated cardiomyopathy, exceed similar parameters in patients with HF of ischemic genesis. A possible connection between the obtained results and future adverse outcomes of HF requires further study.

ENDOVASCULAR TREATMENT OF PARAPANCREATIC VESSELS PATHOLOGY

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Introduction. Chronic pancreatitis is one of the leading diseases of the upper gastrointestinal tract in terms of frequency. One of the formidable

complications of chronic pancreatitis is the involvement in the pathological process of the vessels of the parapancreatic zone with the formation of aneurysms, arrosions of the splenic artery, gastro- and pancreatic-duodenal, hepatic or superior mesenteric arteries with the development of bleeding.

Aim of the study. To improve the results of surgical treatment of chronic pancreatitis, complicated by vascular pathology of the parapancreatic zone.

Materials and methods. On the basis of Grodno University Clinic in the department of X-ray Endovascular Surgery, 21 embolizations of the arteries of the parapancreatic zone were performed due to complications of chronic pancreatitis. Among the patients there were 16 (76.2%) men and 5 (23.8%) women. They had a history of chronic pancreatitis, which was confirmed using instrumental and laboratory research methods. 2 patients (9.5%) had a stationary aneurysm. 19 (90.5%) patients had a bleeding clinic, which required urgent surgical interventions.

Results and discussion. Angioembolization of the parapancreatic arteries was effective in 15 (93.75%) patients, which was confirmed by the results of control angiograms. In 5 cases, angioembolization was the final option for surgical treatment. Endovascular interventions to stop bleeding were performed at the first stage in 10 patients, subsequently, these patients underwent radical reconstructive resection-drainage operations on the pancreas in the "cold period". Angioembolization of the splenic artery for recurrent bleeding from the varicose veins of the fundus of the stomach due to segmental (left-sided) portal hypertension to the achievement of stable hemostasis, followed by a persistent absence of recurrent bleeding in 6 patients.

Conclusion. The use of intraluminal embolization for vascular pathology of the parapancreatic zone in treatment of chronic pancreatitis complications is a minimally invasive and effective method.

EVALUATING THE IMPACT OF BEVACIZUMAB AS A TARGETED THERAPY IN COMBINATION WITH STANDARD CHEMOTHERAPY ON DISEASE PROGRESSION AND TREATMENT OUTCOMES IN OVARIAN CANCER

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Introduction. Ovarian cancer (OC), which originates from the epithelium of the reproductive tract, encompasses fallopian tube cancer and primary peritoneal carcinoma. According to WHO GLOBOCAN 2022 data, Eastern Europe reports the highest incidence, with 11 age-standardized rates (ASR) per 100,000 and a mortality rate of 6 ASR per 100,000. Bevacizumab is commonly used in combination with other chemotherapy agents as a targeted therapy (TT)

to treat ovarian cancer at various stages. This drug works by inhibiting vascular endothelial growth factor (VEGF), which reduces blood supply to the tumor and prevents further tumor growth.

Aim of the study. This study aims to evaluate the first progression (FP), adherence, and efficacy of Bevacizumab as a targeted therapy in conjunction with standard chemotherapy (SCT) for OC. The analysis focuses on patients with ovarian cancer, who have undergone Bevacizumab treatment.

Materials and methods. Patient data was collected from Grodno University Clinic database, including records from 41 OC patients, who began Bevacizumab treatment, while continuing their existing chemotherapy regimen between 2018 and 2024. The analysis involved reviewing chemotherapy reports, diagnostic imaging, such as CT, MRI, and ultrasound scans, histological, and laboratory findings. The data allowed for the calculation of the time, until FP occurred for both SCT and Bevacizumab treatments. Additionally, the average number of chemotherapy cycles required to reach FP was assessed.

Results and discussion. The standard treatment protocol for ovarian cancer typically begins with cytoreductive surgery, followed by standard chemotherapy. When cancer shows resistance to treatment, Bevacizumab as a targeted therapy is introduced. Among the 41 patients, 19 (46.34%) were diagnosed before menopause, while 22 (53.66%) were diagnosed post-menopause. The average age of diagnosis was 49.29 years. Of these patients, 6 (14.63%) had died, and the remaining patients are still undergoing treatment.

Regarding disease progression, the peritoneum was the most common site for metastasis. A total of 15 (36.58%) patients developed peritoneal carcinomatosis, 12 (29.26%) presented with ascites, and 13 (31.70%) had metastatic foci in the liver. Fewer cases involved lung and pleural (4.87%), bone (4.87%), and brain metastasis (2.43%). The most commonly affected lymph nodes included retroperitoneal, pelvic, inguinal-iliac, and supraclavicular. Elevated oncomarkers such as CA-125 and HE-4 were observed in patients upon FP, following SCT and Bevacizumab treatment.

In all patients, cytoreductive surgery was performed except for two (4.87%), who did not undergo primary cytoreduction, and two (2.43%), who had optimal interval cytoreduction. Seven (17.07%) patients received secondary cytoreduction during their treatment. Additionally, two (4.87%) patients underwent radiotherapy targeting metastatic foci, and one (2.43%) had radiotherapy before the primary cytoreduction surgery.

Regarding chemotherapy, 23 (56.09%) patients received a combination of carboplatin and paclitaxel during their SCT. Ten (24.39%) continued carboplatin and paclitaxel treatment along with Bevacizumab. The most commonly used combination therapy with Bevacizumab was Gemcitabine, administered to 14 (34.14%) patients. Other chemotherapy drugs, such as irinotecan, doxorubicin, docetaxel, and cisplatin, were also used in combination with Bevacizumab. Two patients (2.43%) experienced an allergic reaction to carboplatin, and the most common side effects observed were nausea and vomiting.

At the time of diagnosis, 60.97% of patients had Stage 3 cancer, 21.95%

had Stage 4, 9.75% had Stage 2, and 7.31% of patients were diagnosed with Stage 1. The most common histological type of OC was serous adenocarcinoma, and the cancer grading distribution was as follows: G3 = 53.65%, G2 = 41.46%, and G1 = 4.87%.

The average number of chemotherapy cycles before FP was 5.42 for SCT and 5.78 for Bevacizumab. Comparing the duration of FP, 24 (58.53%) patients had a longer FP duration with Bevacizumab, while 13 (31.70%) had a longer FP duration with SCT, and 4 (9.75%) had equal FP durations for both treatments. The median time to FP for SCT was 12.21 months, whereas it was 9 months for Bevacizumab. Notably, 16 patients (39.02%) did not experience FP during Bevacizumab treatment, with their median treatment duration extending to 12.68 months.

Conclusion. Bevacizumab has proven to be an effective targeted therapy for ovarian cancer across different stages. It significantly extends the duration before the first progression of metastasis and stabilizes further disease progression.

PREECLAMPSIA AS A SIGNIFICANT CONCERN IN CONTEMPORARY OBSTETRICS.

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Introduction. Preeclampsia is a severe hypertensive disorder that arises after the 20th week of pregnancy, characterized by high blood pressure and proteinuria. It poses significant risks to both maternal and fetal health, making early detection and management essential. The condition is linked to factors such as abnormal placentation and genetic influences, with symptoms ranging from mild headaches to severe abdominal pain.

Globally, preeclampsia affects 2-8% of pregnancies, with similar prevalence in Belarus (4-6%). Its occurrence is influenced by maternal health, socioeconomic factors, and prenatal care access. Effective monitoring is crucial, as preeclampsia can lead to serious complications during and after pregnancy.

Recognizing symptoms early is a key to timely intervention. Continued research and education are essential for healthcare professionals and expectant mothers to improve outcomes for both mother and baby.

Aim of the study. Analysis of the women with preeclampsia, cause of pregnancy, complications and treatment.

Materials and methods. We have analyzed about 40 cases of women with preeclampsia and their case histories, analysis results, hormonal status, courses of pregnancy, gynecological and extragenital pathology, term of labor and the condition of babies.

Results and discussion. The average age of the analyzed patients was 32

years. According to the literature, the most common causes were advanced age of women, extra genital pathology, heart diseases, obesity, other chronic disorders. Based on our study, the causes were renal pathology (35%), arterial hypertension (30%), and obesity (20%).

In this study the most prevalent complications caused by these causes in pregnancy were premature rupture of membrane (35%) and pure contractions (27.5%). These complications acted as the indications for emergency (20%) or planned deliveries by cesarean section (50%). About 30% of the examined patients had vaginal delivery. About 20% of the examined patients had premature labor. All the newborns of the studied patients were with an Apgar score of 7/8, 8/8 and 8/9, with an average weight of 2.7 kilograms, average height 50.2 centimeters. All the complications were compensated with conservative treatment.

Conclusion. Preeclampsia is a severe hypertensive condition in pregnancy that can lead to various complications during both pregnancy and labor. It also increases the risk of premature birth. Therefore, it is crucial to monitor pregnant patients with hypertension to ensure proper treatment and stabilize blood pressure. Maintaining pregnancy and implementing preventive measures against preterm labor are essential. Given the effectiveness of treatment, early diagnosis and appropriate management play a vital role in achieving a successful pregnancy and ensuring the birth of a healthy newborn.

EXPLORING NEUROGENERATIVE DISEASE OF THE CENTRAL NERVOUS SYSTEM BY THE TYPE OF CEREBELLAR DEGENERATION DIAGNOSIS

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Introduction. The central nervous system (CNS) processes information and delivers it to the peripheral nervous system through signal conduction from one neuron to another via synapses. Thus, through synaptic transmission (also known as neurotransmission), CNS can control smooth, skeletal, and cardiac muscles, bodily secretions, and organ functions.

An essential role in information transmission throughout the CNS and peripheral nervous system is played by neurotransmitters (NTs), which are endogenous chemical messengers that carry and amplify nerve-to-nerve signaling or signals between nerves and other cell types. These small molecules are crucial for communicating sensory, motor, and integrative neuronal messages, affecting many functions, such as emotions, thoughts, memories, movements, and sleep patterns. These chemicals play essential roles in the functioning of the brain, being fundamental regulators of neuronal growth, differentiation, and survival. Consequently, abnormal levels of NTs are reflected

in dysregulation of brain functions, leading to various physical, psychotic, and neurodegenerative disease.

Neurodegenerative diseases of the central nervous system are characterized by the progressive loss of neurons and are influenced by a combination of genetic, environmental, and pathological factors. Key genetic factors include mutations in specific genes associated with diseases like Alzheimer's (e.g., amyloid-beta and tau proteins) and Parkinson's (e.g., synuclein). Environmental factors, such as exposure to toxins and lifestyle choices, also play a significant role in disease onset. Additionally, neuroinflammation and immune responses contribute to neuronal damage, while age remains the most significant risk factor, with the incidence of these diseases increasing as individuals grow older. Understanding these multifactorial etiologies is crucial for developing effective therapeutic strategies.

Aim of the study. The objective of this article is to provide a comprehensive exploration of the Neurogenerative disease of the central nervous system by the type of cerebellar degeneration, cerebellar ataxia and severe dysarthria, which is diagnosed.

Materials and methods. The study involved the analysis of a report obtained from Gomel Regional Clinical Hospital of the Disabled People of the Patriotic War, presenting with pathological conditions affecting the Central Nervous System. The materials utilized for examination included the MRI scanning of the axial, sagittal and horizontal axes of the head.

Results and discussion. The results of the research revealed the following neurological status: Conscious. Cognitive functions are normal. Speech is dysarthric, scanned. Oral automatism reflexes are bilateral. Pupils D=S, 3 mm. Eye movements are full. No sensory disturbances on the face were revealed, the trigeminal nerve exit points are painless. The face is symmetrical. Hearing and vestibular function are unchanged. The soft palate is mobile, with symmetrical sound. Swallowing of solid and liquid food is free. Tongue is along the midline. Deep reflexes from the arms and legs are without a clear difference between the sides. Muscle strength is normal. Muscle tone D=S, decreased. There are no disturbances of superficial and deep sensitivity. Severe ataxia and intention tremor are detected during coordination tests. Staggers are in the Romberg position. Severe gait ataxia. There is no pathological muscle fatigue or myotonic delay. There is dysfunction of the pelvic organs, such as incontinence. There are no meningeal signs. These findings underscore the significance of neurogenerative disorders of the central nervous system by the type of cerebellar degeneration, cerebellar ataxia and severe dysarthria, contributing to a better understanding of disease epidemiology and patient management strategies.

Conclusion. The findings of the study highlight a notable prevalence of the effect of neurogenerative disorders on the dysfunction of pelvic organs, such as inconsistence.

SLEEP QUALITY, STRESS LEVEL AND ACADEMIC PERFORMANCE OF STUDENTS OF VSMU NAMED AFTER N.N. BURDENKO: PATHOPHYSIOLOGY OF EDUCATIONAL STRESS, ASSESSMENT OF INFLUENCE ON THE EDUCATIONAL PROCESS AND WAYS OF CORRECTION

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Introduction. Academic stress is a key problem in medical schools, where intensive workloads are combined with professional responsibility. According to WHO, more than 60% of students experience chronic stress that impairs cognitive performance. In medical education settings, the risks are amplified by the need to assimilate large amounts of information and the lack of recovery time. Physiological mechanisms of stress lead to hypercortisolaemia, which impairs hippocampal neuroplasticity, explaining the association of stress with reduced academic performance. Sleep deficits exacerbate these effects by impairing memory consolidation and increasing anxiety. Despite extensive research, the complex relationships of stress with sleep quality, physical activity, and academic performance remain poorly understood.

Aim of the study. The purpose of the study was to assess the level of academic stress in students of N.N. Burdenko VSMU during the pre-session period and to identify its relationship with sleep quality, physical activity and academic performance.

Materials and methods. The study involved 200 students of all courses (154 women and 46 men). Stress level was assessed using validated questionnaires: the Kessler Psychological Distress Scale (K10) and the Depression, Anxiety and Stress Scale (DASS-21). Sleep quality was analyzed through the Pittsburgh Sleep Quality Questionnaire (PSQI). Additionally, data on academic performance, physical activity, job availability and addictions were collected. Statistical processing of the data was performed in StatTech v.4.1.3 software.

Results and discussion. The study revealed significant gender differences in stress levels: women had a median score of 22 (Q1-Q3:17-28) on the K10 scale, which was higher than men (Me=17; Q1-Q3:14-23; $p<0.001$). According to the DASS-21 scale, 85.4% of students with high stress were female ($p<0.001$). Academic performance showed an inverse relationship with distress: honours students had lower levels of stress (Me=18) compared to those with dissatisfactory academic performance (Me=22; $p=0.002$). Moreover, 20.7% of excellent students reported high sleep quality compared to 14.3% in the low-performing group ($p<0.005$).

Sleep quality proved to be a key predictor of stress: with low PSQI scores, median distress reached 24 (Q1-Q3:19-30), whereas with high sleep quality it

decreased to 16 (Q1-Q3:13-21; $p<0.001$). Correlation analysis confirmed a strong association of sleep with stress ($r=0.585$ for Q10; $r=0.546$ for DASS-21). Lifestyle also influenced stress: 66.7% of students with normal stress levels exercised (vs. 45.9% in the high stress group; $p<0.05$), and those working were less likely to experience distress (21.4% vs. 78.6%).

The findings are consistent with the concept that chronic stress impairs cognitive function through neurotransmitter imbalances. Gender differences may be explained by both biological reactivity and social factors. Sleep quality modulates cortisol levels, affecting memory and attention, while physical activity and employment contribute to emotional unloading.

Conclusion. Reducing stress requires a comprehensive approach. Priority measures are optimization of sleep and nutrition, regular physical activity, and the development of psychological support. The findings indicate the need for further research to create personalized anti-stress strategies tailored to the specifics of medical education. The implementation of such measures can improve the quality of training and reduce the risks of professional burnout in future doctors.

DRUG-INDUCED LUNG INJURY (CASE REPORT)

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Introduction. Amiodarone is widely used to treat arrhythmia. Classified as a class III antiarrhythmic drug, it is effective in managing various cardiac arrhythmias, including atrial fibrillation and ventricular tachycardia. Despite its therapeutic benefits, amiodarone is associated with a range of pulmonary complications, collectively referred to as amiodarone lung toxicity. This toxicity can manifest as asymptomatic pulmonary infiltrates, acute respiratory distress, or chronic interstitial lung disease, including pulmonary fibrosis. The risk of lung toxicity is particularly concerning due to amiodarone's long half-life and the potential for cumulative toxicity over time.

Aim of the study. To analyze drug-induced lung injury (against the background of amiodarone therapy).

Materials and methods. A clinical case was analyzed, which provides an example of the development of drug-induced lung injury (associated with the use of amiodarone).

Results and discussion. Patient P. (67 years old) was admitted in February 2024 to the pulmonology department of the healthcare institution "Grodno University Clinic", diagnosis: interstitial changes caused by amiodarone. Respiratory failure 1. Upon admission, the patient complained of a cough with the separation of mucous sputum, shortness of breath during physical exertion,

general weakness.

Medical history: has been suffering from atrial fibrillation for more than 10 years (every six months, drug cardioversion with amiodarone, followed by accumulative therapy for about 3 weeks). In October 2023, during a medical examination, changes were detected on the chest X-ray, the patient was prescribed a course of antibacterial therapy – ceftriaxone. The patient was recommended oral methylprednisolone therapy at a dose of 12 mg. On the control chest X-ray in direct projection, when compared with the presented data of October 2023, the dynamics are positive due to a decrease in shadowing in both lungs, remaining on the right in the projection of the middle lobe with fuzzy contours. Inflammatory-sclerotic processes in the pulmonary interstitium induced by endothelial dysfunction lead to remodeling of the vessels of the pulmonary circulation, neoangiogenesis and, as a consequence, to the progression of ILD with the development of pulmonary hypertension.

Conclusion. Thus, based on the given example, the need for serious monitoring of patients receiving pharmacotherapy with potential pulmonary toxicity is demonstrated to prevent the occurrence and progression of drug-induced interstitial lung lesions. It is recommended to use methods for assessing endothelial dysfunction, when forming a differential diagnostic algorithm to prevent the development of complications, which will allow choosing the optimal treatment option for this nosological entity.

ATOPIC DERMATITIS IN INFANTS AND ITS CORRELATION WITH FOOD ALLERGY

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Introduction. Atopic dermatitis and food allergies are the most common allergic conditions in early childhood. Atopic dermatitis typically appears in infancy, with 60% of cases occurring before age one and 85% by age five. While diagnostic tools are sensitive, they often struggle to confirm food allergies in early stages when IgE levels are low. Additionally, 30-40% of patients may have atopic dermatitis without any food allergy connection.

Aim of the study. To assess the prevalence of atopic dermatitis and food allergy as a comorbidity in children residing in the Grodno region.

Materials and methods. A total of 244 infants from Grodno region were enrolled in our study from June 2022 to December 2023, with 212 reaching the age of 2. We collected data on clinical symptoms, family allergy history, and obstetric details via parent questionnaires. Infants suspected of food allergies followed a 2- to 4-week elimination diet. Improvement in skin symptoms indicated a food allergy alongside atopic dermatitis, while no improvement

suggested atopic dermatitis alone. Serum immunoglobulin E (sIgE) tests were performed using the ImmunoCap method. Pediatricians conducted regular examinations throughout the first two years.

Results and discussion. In a study of 212 infants, 53.77% were boys and 46.22% were girls. Among them, 27% were diagnosed with atopic dermatitis (AD), with 59.64% being boys and 40.35% girls ($p > 0.05$). Food allergies were present in 36.8% of those with AD. Delivery method showed that 52.63% were born vaginally and 47.37% by cesarean section ($p > 0.05$). Of the AD children, 61.4% were breastfed and 15.7% were formula-fed in the first month ($p = 0.07$). However, only 49.12% were breastfed up to 3 months, and 36.84% were formula-fed ($p > 0.05$). A family history of allergy also plays a role, but nowadays there are many cases of allergic diseases, that manifest in offspring from family with negative family history. Notably, 68.42% of AD children had a negative maternal history of allergic disease ($p = 0.009$).

Conclusion. The prevalence of atopic dermatitis in the studied population was 27%, with food allergy diagnosed in 36.8% of cases. Our study found no direct influence of gender, mode of delivery, or feeding type during the first three months on atopic dermatitis prevalence. Even infants born to mothers without allergic disease history are at a significant risk of developing atopic dermatitis.

EVALUATION OF MEDICAL REASONS FOR THE TERMINATION OF PREGNANCY IN THE FIRST TWO TRIMESTERS

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Introduction. The evaluation of medical reasons for pregnancy termination during the first and second trimesters is critical for understanding the complexities surrounding this decision. Still, advancements in ultrasound technology, allow earlier and more accurate diagnosis. The second trimester is particularly significant, as it is a period when many women are offered the option of termination upon the detection of fetal structural anomalies.

Aim of the study. Analyze the causes for the termination of pregnancy in the first and second trimesters in pregnant women, who reside in Grodno region for medical reasons.

Materials and methods. This study analyzed the medical records of 137 pregnant women hospitalized at Grodno Regional Perinatal Center in Belarus for pregnancy termination due to medical reasons and complications between 2022 and 2023. Cases of spontaneous abortion were excluded. The average age of the participants was 29.2± 0.417 years. Patient characteristics were recorded in a Microsoft Excel database, and statistical analysis was performed using the same software.

Results and discussion. The observation group included 137 married pregnant women aged 18 to 44, all without chronic diseases. Only one had a hereditary risk for type 1 diabetes. During the 10-12-week pregnancy period, one woman contracted COVID-19 and another had pyelonephritis; the others were healthy. Most medical issues leading to pregnancy terminations occurred between 12-15 weeks (36.5%) and 18-21 weeks (47.4%). The primary reasons for termination were Down syndrome (21.2%), other chromosomal disorders (8.1%), and congenital malformations, particularly in the central nervous system (22.6%), cardiovascular system (16.1%), musculoskeletal system (13.1%), gastrointestinal tract (5.1%), respiratory system (2.9%), urinary tract (3.6%), and multiple defects in 7.3%. These issues were identified during routine ultrasounds and evaluated by a multidisciplinary team. Four patients (2.9%) refused termination. All procedures were carried out using curettage, with no reported complications.

Conclusion. The common causes of termination of pregnancy during the first two trimesters concerning medical issues are chromosomal diseases in the first place and congenital malformations in the second place.

CLINICAL AND LABORATORY FEATURES OF PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCTION COMPLICATED BY VENTRICULAR ARRHYTHMIAS

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Introduction. Sudden cardiac death in the setting of an acute myocardial infarction (MI) is most frequently the result of ventricular arrhythmias. The appearance of a sustained ventricular arrhythmia following an MI, such as ventricular tachycardia (VT) or ventricular fibrillation (VF), in the early period post-MI may be the harbinger of ongoing myocardial ischemia, the development of proarrhythmic myocardial scar tissue, or an electrolyte disturbance, such as hypokalemia. In-hospital mortality approaches 20% in patients who develop VT or VF following an MI, therefore prevention and treatment of arrhythmias during and immediately after acute MI is extremely relevant.

Aim of the study. To identify clinical, anamnestic and laboratory features of patients with STEMI and ventricular arrhythmias compared to patients with uncomplicated STEMI.

Materials and methods. The study included 91 patients with STEMI, who were admitted to Grodno State Cardiological Center for treatment from February 2024 to February 2025. Group 1 included 64 patients with STEMI, while Group 2 included 29 patients with STEMI and ventricular arrhythmias (sustained VT or

VF). All patients underwent clinical, laboratory, and instrumental studies, including coronary angiography. Statistical analysis was performed using the STATISTICA 12.0 software.

Results and discussion. Patients in both groups were comparable in age (58 [52; 64] vs 60 [55; 64], p=0.181) and gender (male sex 78% vs 76%, p=0.865). There were no significant intergroup differences in the prevalence of hypertension, obesity, hyperlipidemia, prior stroke, atrial fibrillation and diabetes mellitus (p>0.05). 10 patients with STEMI had episodes of VF and 21 patients had episodes of sustained VT. Clinical blood count of patients didn't demonstrate any significant differences, except for levels of WBCs, which were significantly higher in patients of Group 2 (12.2 [9.3;15] vs 9.8 [7.6;11.5] 10*9, p=0.008) Also patients with AF had significantly higher levels of urea (6.1 [4.8; 7.8] vs 5.2 [3.9; 6.1] mmol/L, p=0.04), and glucose (7.9 [5.3; 8.8] vs 7.1 [5.3; 8.1] mmol/L, p=0,008). Their lipid profile parameters (total cholesterol, triglycerides, LDL, HDL) were comparable, as well as electrolytes and liver enzymes (p>0.05). Also, patients of Group 2 had significantly higher troponin levels (30430 [6352; 50000] vs 12479 [846; 15964] ng/L, p=0.004) than patients of Group 1.

According to the results of transthorasic echocardiography, patients of both groups were comparable in diameters of both atria and ventricles. However, patients of Group 2 had larger end-systolic volume of the left ventricle (62 [46; 62] vs 54 [42.5; 63] ml p=0.004), and lower LVEF (49 [45; 54]% vs 54 [51; 59]%, p=0.001).

Conclusion. Patients with STEMI and ventricular arrhythmias had higher troponin levels, and lower LVEF, which can contribute to arrhythmia development in this category of patients.

PREVALENCE, COPING MECHANISMS, CULTURAL PERCEPTIONS OF ANXIETY RELATED SOMATIC SYMPTOMS IN SRI LANKAN MEDICAL STUDENTS LIVING IN BELARUS

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Introduction. Medical students living in foreign countries undoubtedly undergo chronic stress and anxiety. High levels of stress may alter the cognitive function and learning capacity of students. The biopsychosocial model demonstrates that longstanding stress leads to chronic physical manifestations. Coping mechanisms of students are individualized and greatly influenced by their respective cultural perspectives

Aim of the study. To study prevalence, coping mechanisms, cultural perceptions of anxiety related somatic symptoms in Sri Lankan medical students

living in Belarus.

Materials and methods. The Perceived Stress Questionnaire (PSQ-30) was used in this study to gauge people's perceived stress levels and how they relate to the physical symptoms.

A total of 77 eligible participants were included (n = 77). Each detail was assessed by three writers to make sure it satisfied the requirements for inclusion.

Results and discussion. 77 participants from Grodno State Medical University who represented Sri Lankan nationality satisfied the inclusion criteria. They were all medical students as a result. Stressful life events and situations that frequently cause or worsen symptoms were evaluated using the PSQ questionnaire.

The study involved 32 males (41.56%), with a moderate level of stress (PSQ index mean of 0.40), and 45 females (50.44%), with a slightly higher level of stress, as indicated by a mean PSQ score of 0.43.

Perceived stress levels of various age groups were examined. The findings showed that participants under the age of 21, with a percentage of 6.49% of the entire group, had a mean PSQ index of 0.50. The majority of participants (58.44%) between the ages of 21 and 25 had a mean PSQ index of 0.44, while 35.06% of the sample was above 25, with a mean PSQ index of 0.36.

Based on the data, the majority of participants (61.04% of the total sample) were in their fifth year of study, with a mean PSQ index of 0.40. Interestingly, although they made up only 2.60 percent of the sample, second-year students had the highest mean PSQ index at 0.78. Interns, on the other hand, reported the lowest mean PSQ index, 0.26, indicating that there are considerable differences in how stress is perceived in different academic years.

With a mean PSQ index of 0.42, the research shows that most individuals (66.23%) have moderate perceived stress levels, falling between 0.3 to 0.6 PSQ index range. Low stress levels were indicated by a smaller percentage (20.78%), who reported a PSQ index between 0-0.3. With a mean PSQ index of 0.71, 12.99% of individuals fell into the high stress range of 0.6-0.9.

The most frequently reported symptom, reported by 70.9% of participants (n=56), was headache. Palpitations, or a rapid heartbeat, were noted by 30.4% of respondents (n=24). Twenty-one percent of individuals (n=17) reported sweating or trembling. A total of forty-three responders, or 54.4%, reported experiencing stomach discomfort, nausea, or digestive problems. 34.3% of individuals reported having bodily pains or muscle tightness. Of the subjects, 19.0% reported feeling lightheaded or dizzy (n=15), and 24.1% reported feeling tired or lacking energy (n=19). A choking sensation or trouble breathing was reported by 12.7% of participants (n=10).

A significant number of respondents (57.0%, n=45) mention they would rather stay away from stressful circumstances. It was found that talking to friends or relatives was another common coping strategy (55.7%, n=44). Additionally, we found that 39.2% of respondents (n=31) reported participating in physical activities. Furthermore, 19.0% of those surveyed used herbal or traditional medicines. Just 7.6% of respondents (7.6%, n=6) mentioned they

would seek advice from a physician or mental health specialist. Lastly, 17.7% of participants (n=14) used relaxation techniques, while 22.8% of participants (n=18) used prescription or over-the-counter drugs.

Conclusion. The study found that the majority of respondents prefer to avoid stressful situations, while others cope by talking to friends or relatives. Others engage in physical activities and use herbal medicines and relaxation techniques.

According to these results, a minority of people report high levels of stress, while the majority report moderate levels. Given the substantial influence that perceived stress has on general well-being, it is necessary to focus on interventions to assist people in higher stress categories. The causes of these variations may be investigated further, and methods to lessen student stress could be created.

A RETROSPECTIVE STUDY OF PEPTIC ULCER DISEASE IN PEDIATRIC PATIENTS

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Introduction. Prevalence of peptic ulcer disease is identified in pediatric patients, although relatively rare in comparison with adults. It is diagnosed 1 in every 3000 pediatric admissions. For the effective management of peptic ulcer disease and its complications, its risk factors are yet to be studied extensively. Helicobacter pylori, which shows microbial resistance, is studied to be the main etiological agent of peptic ulcer disease in children. Studies have indicated an association of peptic ulcer disease and hepatic impairments. By studying the prevalence, risk factors, and etiology we can improve management strategies of peptic ulcer disease in childhood.

Aim of the study. By analyzing the case reports of patients with gastric and/or duodenal ulcers, to study the features of occurrence, clinical picture, etiology, the most common complications, changes in laboratory parameters and features in the treatment of this group of patients.

Materials and methods. The study was conducted at the Health Care Institution – Grodno Regional Children's Clinical Hospital. The case reports of 74 patients diagnosed with duodenal and/or gastric ulcers hospitalized for the period from 2019 to 2025 were studied. Indicators such as gender, age, place of residence, diagnosis, etiology, heredity, complications, predominant symptoms, laboratory parameters and treatment were analyzed.

Results and discussion. Of the 74 patients studied, 47 (64%) were boys and 27 (36%) were girls. Among the patients, persons over 10 years of age predominated (86.5%), patients from 6 to 10 years old accounted for 5.4%, and patients under 5 years old accounted for 8,1%. The number of urban residents

was 54 people (73%), residents of regional centers – 20 people (27%). 12 patients (16.2%) had a stomach ulcer, 57 (77%) had a duodenal ulcer, and 5 patients (6.8%) had a gastric and duodenal ulcer. Patients with a burdened hereditary history included 30 people (40%). According to localization, gastric ulcers were observed mainly in the antral (13.5%) and pyloric (6.8%) parts. Duodenal ulcer in most cases occurred in the bulb – 59 people (78%). According to the form, 63 (85%) patients had an acute form of ulcer, and 11 (15%) had a chronic form. By etiology, the following groups were identified: ulcer associated with Helicobacter pylori – 31 patients (42%), ulcer associated with dietary habits – 21 patients (28.3%), due to stress – 6 patients (8.1%), due to long-term hormonal therapy – 3 patients (4%), unknown etiology – 13 people (17.6%). Pain as the predominant symptom was observed in 52 patients (70.3%), vomiting – in 14 (19%), heartburn was noted in 6 (8%) patients, dyspepsia was noted in 2 patients (2.7%). Among complications, bleeding occurred in 11 patients (15%), perforation – in 3 (4%) patients. Iron deficiency anemia was observed in 16 (22%) patients. An increase level of alkaline phosphatase was noted in 18 (24%) patients, cholesterol – in 12 (16.2%), an increase level of C-reactive protein – in 11 (15%) patients, bilirubinemia in 10 (1.4%) patients, an increase ALT and AST was noted in 8 (11.8%) patients. Surgical treatment of ulcers was used in 9 patients (12%) of all hospitalized patients.

Conclusion. In conclusion, it can be noted that gastric ulcers in the study group of patients occurred mainly in boys over 10 years old living in the city. According to localization, in most cases there was an acute ulcer of the duodenal bulb. The leading role in the etiology of ulcers is played by the bacterium Helicobacter pylori, dietary habits and stress. The clinical picture was dominated by pain and vomiting. The most common complication was bleeding. Laboratory indicators showed iron deficiency anemia, increased levels of alkaline phosphatase, CRP, and bilirubin.

THE INFLUENCE OF L-ARGININE AND AMINOGUANIDINE ON THE PERITONEUM OF RATS WITH PERITONITIS

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Introduction. The relevance of this research in this direction are, the morphological target in peritonitis is the peritoneum, it is important to determine its structural changes under administration of modulators of nitric oxide (NO) synthesis, because there are no approaches to pathogenetic therapy of peritonitis that involve influencing the «L-arginine-NO» pathway.

Aim of the study. To assess the histological changes of peritoneum in rats with peritonitis and combined administration of NO synthase substrate,

L-arginine, and inhibitor of inducible NO synthase, aminoguanidine.

Materials and methods. Rats were divided into 3 equal series, which were injected intraperitoneally: 1st series (control) – 0.9% sodium chloride, 2nd series (experimental peritonitis, EP) – 15% fecal suspension in a volume of 0.6 ml/100 g of body weight, according to the method of Blinkov Yu.Yu. et al. [1] in modification [2], 3rd series (EP + L-arg + AG) – the rats with EP and combined administration of L-arginine, L-arg, and aminoguanidine, AG. Morphological studies of the peritoneum and ileum wall were performed using a Micromed 3 var 3-20M light microscope with planachromatic objectives and trinocular attachment integrated with a RisingCam E3CMOS 20000KPB digital video camera and using the RisingView software for obtaining and processing microphotographs. Histological changes in the micropreparations of peritoneum, stained with hematoxylin and eosin, were assessed using a scale for semi-quantitative assessment of disorders (from + to ++++) on the third day of peritonitis.

Results and discussion. Under the conditions of EP modeling, after 3 days changes in the structure of the peritoneum were noted, compared with the signs in rats of the control group, such as purulent-fibrinous deposits on the peritoneum, significant turbidity of the exudate (+++), and on microscopy, the severe desquamation of mesothelial cells (+++), leukocyte infiltration and fragmentation (+++) of the connective tissue of the peritoneum (+++), microcirculatory disorders in the form of venous hyperemia and stasis with single microthromboses (+++), the appearance of loose adhesions, a pronounced accumulation of leukocytes in the intestinal mesentery, as well as swelling of myocytes and neurons of the intermuscular nerve plexus, sometimes with signs of destruction (+++).

In its turn, morphological examination of the peritoneum in rats with EP and combine introduction of L-arg and AG after three days of inflammatory process revealed less pronounced disturbances than in animals with EP without their use: significantly less pronounced swelling and desquamation of mesothelial cells, + (with EP and introduction of either L-arg or AG - ++, +), a decrease in damage and leukocyte infiltration of connective tissue and smooth muscle fibers, + (with EP and separated use of L-arg or AG - ++, +/++), the absence of thrombi in the vessels of the microcirculatory bed, microabscesses, – (with EP and introduction of L-arg or AG - +, -). Histological preparations sometimes revealed areas of the serous membrane that were practically indistinguishable in structure from the peritoneum of the control group of rats.

Conclusion. Morphological studies in rats with EP under conditions of combined use of «L-arg-NO pathway» modulators L-Arg and AG showed a decrease in the degree of peritoneal damage, which may be a consequence of less pronounced microcirculatory disorders, edema, leukocyte infiltration and oxidative damage. The introduction of these NOS modulators may have a corrective effect due to maintaining constitutive NOS activity by L-arg and inhibiting inducible NOS by AG, which can be considered as a pathogenetic therapy for acute peritonitis by influencing the «L-arg-NO» biochemical pathway.

VITAMIN D STATUS IN OBESITY AND TYPE 2 DIABETES

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Introduction. Many researchers note the relationship between vitamin D deficiency/insufficiency and an increased risk of developing a number of diseases of both the musculoskeletal system (osteoporosis, sarcopenia) and metabolic disorders: obesity, diabetes mellitus (DM) [2].

According to research, vitamin D has pleiotropic effects, regulates insulin secretion in Î²-cells of the pancreas, and with its deficiency, the number of insulin receptors decreases, the activity of glucose transport proteins and PPAR-receptors decreases, insulin resistance, prediabetes and DM develop [2], which aims at timely detection and correction of vitamin D status.

Aim of the study. To assess the level of vitamin D in the body by the level of 25(OH)D in the blood plasma in patients with obesity and DM type 2.

Materials and methods. The study involved 32 patients, with 46,9% (n=15) of them being obese – group 1. The average age of this group was 65 (50; 77). Another 53,1% (n=17) of participants had DM type 2 – group 2. The average age in this group was 68 (63; 71). The data was analyzed by the 4D client program at the State Healthcare Institution "Grodno City Polyclinic No. 6". We analyzed: body mass index (BMI), blood pressure (BP), vitamin D level – 25(OH)D, glycated hemoglobin – HbA1c, creatinine, triglycerides (TG), and cholesterol (CH). The vitamin D status was assessed by the level of 25(OH)D in blood plasma, which corresponds to the optimal level of vitamin D as 25(OH)D > 30 ng/ml, while insufficiency is 29-20 ng/ml and deficiency is <20 ng/ml. We performed statistical analysis by using program "STATISTICA 10.0".

Results and discussion. The analyzed groups of patients had not differences in age, BP, creatinine, CH, or TG (p>0,05). BMI was higher in group 1 if compared to group 2 (34,2 kg/m^2 vs 30,1 (28,8; 31,2) kg/m², p=0,01).

The level of 25(OH)D in the blood plasma of patients in group 1 was 14.2 (10.0; 18.8) ng/ml and corresponded to vitamin D insufficiency in 20% (n=3) and deficiency in 80% (n=12) of those examined.

In group 2, the level of 25(OH)D was 14,3 (11,8; 20,3) ng/ml, which corresponded to insufficiency in 29,4% (n=5) and deficiency in 70,6% (n=12) of patients. The level within the optimal range of 25(OH)D in the blood plasma of patients for these two groups was not revealed. No significant differences were found in the levels of 25(OH)D between those examined, nor was there a significant difference in the ratio of vitamin D deficiency to insufficiency (p>0,05).

In group 2, we found a negative relationship between 25(OH)D levels and HbA1c (R =-0,50, p=0,04), as well as a positive relationship between HbA1c levels and TG (R=0,61, p=0,01), TC (R=0,53, p=0,03) and glucose levels

(R=0,55, p=0.02).

Conclusion. In the study conducted in patients with obesity and DM2, the vitamin D status corresponds to a deficiency/insufficiency of the 25(OH)D level in the blood plasma, while in patients with DM type 2, the 25(OH)D level has an inverse correlation with HbA1c, which aims to correct hypovitaminosis D to improve glycemic control in this category of patients.

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