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Photodynamic therapy in cancer using St. John's Wort (*Hypericum perforatum)*

Introduction. Photodynamic therapy (PDT) is a form of treatment that uses non-toxic photosensitive compounds that, when exposed to light of a certain wavelength, are toxic to cancer cells and other diseased cells. One of the most powerful natural photosensitizers used in photodynamic therapy is hypericin, which is found in the plants of *Hypericum perforatum*, known as St. John's Wort.

Aim. Hypericin is a potential clinical anti-cancer agent, many studies have shown its strong anti-cancer activity in vivo and in vitro after irradiation. This paper presents the results of research on the explanation of the mechanism and effectiveness of photodynamic therapy in malignant melanoma based on studies by Kleemann et al.

Material and methods. The metanalysis of three cases.

Results. The study used cultures of 3 malignant melanoma cell lines: A375, 501mel (without dye), UCT Mel-1 (with dye). 3 μM light-activated hypericin at a dose of 1 J/cm^2 UVA was applied for 6 minutes and 10 seconds. Melanoma cells were exposed to 4 hours of hypericin in media and then activated with light and collected for analysis at various time points.

Conclusion. Hypericin-PDT has been shown to be effective in killing non-pigmented (A375 and 501mel) and pigmented (UCT Mel-1) melanoma cells. It can be an effective alternative method of cancer treatment.

Keywords. hypericin, melanoma, neoplasms, photodynamic therapy, St. John's Wort

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DiGeorge Syndrome – literature review

Introduction. DiGeorge Syndrome, also known as 22q11.2 microdeletion syndrome, is associated with a de novo mutation in the long arm of chromosome 22. It may also involve a point mutation in the TBX1 gene or loss of a part of the short arm of chromosome 22. The disease is diagnosed on the basis of three characteristic symptoms: the presence of heart defects, immunodeficiency and hypoparathyroidism. The syndrome is associated with several phenotypes whose clinical manifestations are similar to each other. The prevalence in newborns is 1:9700.

Aim. The aim is to present the characteristics of DiGeorge syndrome, to delineate its pathogenesis and typical symptoms in different patients.

Material and methods. The literature reviews described cases that were analysed for symptoms characteristic for the course of the disease.

Analysis of literature. The literature review and subsequent analysis focused on two sources: „Zespół mikrodelecji 22q11.2 jako problem wielodyscyplinarny" by Marta Skoczyńska and Izabela Lehman and the article "DiGeorge syndrome; DGS", which analyses several cases of the disease.

Conclusion. DiGeorge syndrome is a rare genetic disease with numerous clinical manifestations. Early detection, correct diagnosis and appropriate treatment throughout the life are important.

Keywords. 22q11.2 deletion, aplasia of thymus, cardiac defects, DiGeorge syndrome, tetany

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Alkaloids – caffeine

Introduction. Caffeine is an alkaloid belonging to the methylxanthine group and is found not only in coffee beans. It affects various systems of our body, including: the cardiovascular system, the skeleton and the nervous system. Due to its properties, this compound has found its application in pharmacy.

Aim. The aim of the studywas to present the structure, occurrence, properties and application of caffeine in pharmacy.

Material and methods. The basis for the preparation of the study was the analysis of publicly available literature.

Analysis of the literature. The structure of caffeine is similar to that of purines. This compound is found, inter alia, in coffee beans, cocoa seeds, guarana fruits. Caffeine consumption stimulates the autonomic nervous system and has a mixed effect on the heart and blood vessels. Caffeine can weaken bones and even cause osteoporosis. In addition, it is also a psychostimulant that stimulates the central nervous system. Due to its properties, it is used to treat chronic lung disease in premature babies and can improve weight gain during therapy.

Conclusion. Further research on caffeine and its use may have a positive impact on the development of various fields of medicine and pharmacy.

Keywords. application, caffeine, occurrence, properties

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Can a headache herald a serious illness? – a case report of a patient with RCVS

Introduction. Reversible vasoconstriction syndrome (RCVS) is a disease characterized by severe headache, focal neurological symptoms, and seizures. Symptoms most likely arise from temporary abnormalities in the blood vessels in the brain. Different life-threatening conditions have similar symptoms, so differential diagnosis is necessary.

Aim. Presentation of a case report of a patient with the syndrome of reversible contraction of cerebral vessels in the course of migraine.

Description of the case. A 32-year-old man with sarcoidosis was admitted to the ICU on July 4, 2019 after an episode of sudden cardiac arrest due to ventricular fibrillation. The patient was intubated under sedation and ventilated with a ventilator. Treatment improved and sedation was discontinued. On July 24, 2019, during hospitalization at a cardiology clinic, an episode of speech disorders such as aphasia and weakness of the right upper limb lasting several hours was observed. Computed tomography and angio-CT of the head were performed, revealing hypodense changes and extensive vasoconstriction. After the examination, he developed a headache (no interview was possible due to aphasia). Given the neurological deficits and the results of angio-CT, isolated primary central nervous system vasculitis (PACNS) was suspected and treatment with steroids and immunosuppression was introduced. After a few weeks, digital subtraction angiography (DSA) was performed, which showed that the cerebral vasculature was normal. The stenosis was then found to be transient and most likely due to the RCVS associated with migraine with aura.

Conclusion. In the described patient with recurring rare episodes of migraine with aura during one of the episodes, some features of cerebral vasoconstriction were noted on imaging studies. The vasoconstriction subsided after a few weeks – a syndrome of reversible cerebral vasoconstriction associated with migraine was suggested and allowed to terminate the unnecessary immunosuppression.

Keywords. migraine, RCVS, sarcoidosis

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The use of left ventricular assist device – a risk of complications

Introduction. Intracerebral hemorrhage is a type of intracranial hemorrhage (ICH) that occurs within the brain tissue or ventricles. There are many causes of ICH. The most common are hypertensive and amyloid vasculopathies . They can also be a complication of brain trauma, vascular malforamtions and some medical procedures. The aim of our work is to present a case of a patient with recurrent ICH being the form of LVAD neurological complications.

Aim. Our aim is to present a case report of a patient with complication of LVAD.

Description of the case. A 52-year-old patient, after LVAD implantation in 2018, was admitted to the Emergency Room due to severe headache, dizziness and vomiting that have persisted for 4 days. A CT scan was performed -ICH of the right cerebellar hemisphere and the worm. Angio-CT of the head was performed, there were no deviations from the norm. In the CT scan of the head, 18 days after admission, a new absent hemorrhagic focus in the right hemisphere of the brain was detected. During hospitalization, the patient's condition remained stable, subsequent hemorrhagic foci in the brain occurred without the appearance of a neurological deficit. The patient received anti-edema, anti-emetic and analgesic treatment with improvement of general condition. The anticoagulation therapy could have not been stopped due to the LVAD system. Due to the observed decreases in hemoglobin, gastroscopy was performed and gastritis was diagnosed.

Conclusion. The use of LVAD carries a risk of complications. In order to avoid peripheral embolisation there is a need for anticoagulation. At the other hand, ICH may occur as a complication of anticoagulant treatment. Therefore, an individualized approach and appropriate prevention should be applied for each patient.

Keywords. complications, intracerebral hemorrhages, LVAD

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Gucocerebrosidase deficiency as the main cause of Gaucher disease – a review

Introduction. Gaucher disease is the most common lysosomal storage disease. It is caused by a deficiency of the enzyme glucocerebrosidase, which breaks down glucocerebroside, a component of the cell membrane. Deficiency of this enzyme leads to the accumulation of glucocerebroside in macrophage lysosomes throughout the body. It is an autosomal recessive disease. It leads to multi-system disease with an incidence ranging from 1:30,000 to 1: 50,000 in most countries. Therefore, only a small proportion of physicians are aware of this diagnosis, the symptoms that should lead to its consideration, and the availability of specific tests that confirm it.

Aim. Presentation of complications of Gaucher's disease in the ophthalmic aspect.

Material and methods. Knowledge review with the use of medical articles from PubMed.

Analysis of the literature. Clinical signs and symptoms of Gaucher disease are heterogeneous. More than 30 mutations in the glucocerebrosidase gene have been identified, and some mutations seem to be associated with the expression of a specific disease phenotype. Modern diagnosis of Gaucher disease is carried out either by determining the enzymatic activity in peripheral blood leukocytes or on the basis of DNA analysis. There are three types of Gaucher's disease: type 1 – the most common – manifested mainly by visceral, haematological and skeletal symptoms. Types 2 and 3 are less common and are more often associated with additional neurological symptoms. Typical symptoms are enlargement of the liver and spleen, hematopoietic diseases and skeletal dysfunction due to infiltration of the spleen and bone marrow by glucocerebroside-laden macrophages. Gaucher disease may have an ophthalmic sequelae. They range from intraocular changes to diseases involving the appendages, peripheral nerves, and the brain.

Conclusion. Gaucher disease is also associated with Parkinson's disease and may increase the risk of malignant neoplasms. Due to the fact that this disease affects various systems and organs, it causes both diagnostic and therapeutic difficulties. We have reviewed the literature and in our work we will present the method of dealing with patients with Gaucher disease depending on the main clinical manifestation, as well as in pregnant patients.

Keywords. Gaucher disease, glucocerebrosidase enzyme, ophthalmic complications

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Review work – the occurrence of endometriosis in the scar after cesarean section

Introduction. The etiology, pathology, and progression of Caesarean section scar endometriosis pose a great challenge for clinicians and researchers. It can be easily confused with other states. There is a possibility of unnecessary treatment
Aim. To present the pathogenesis and pathomechanism of endometriosis in a caesarean section scar. Presentation of methods of prevention, detection and treatment of endometriosis.
Material and methods. The selected articles were downloaded from PubMed databases on April 15, 2019. Ranking of knowledge, presenting relevant information on the basis of selected articles relating to the methods of prophylaxis, detection and treatment of endometriosis.
Analysis of the literature. A total of thirteen papers were included in our meta-analysis. Eight studies indicate that Caesarean section scar endometriosis is a rare disease that is difficult to diagnose. The accompanying symptoms are nonspecific. It often occurs after gynecological and obstetric surgeries. It can cause infertility, but it may also be asymptomatic. A wide excision is recommended to prevent recurrence. The next three papers focus on the complication of endometriosis in the cesarean scar, which is the development of a tumor at the endometriotic site. The other two works focus on the diagnosis of endometriosis in the caesarean section scar.
Conclusions. In the case of treatment of endometriosis, appropriate diagnostics and surgery should be applied, and possible complications should be taken into account.
Keywords. cesarean section, cigarette smoking, endometriosis

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Influence of cigarette smoking on the incidence of complications of hormonal contraception

Introduction. Simultaneous smoking of cigarettes and the use of oral contraceptives significantly increase – on the basis of synergistic action – the risk of complications such as heart attack or venous thromboembolism.

Aim. The aim of this study is to assess the effect of smoking on the incidence of complications from hormonal contraception.

Material and methods. In this study, scientific publications published in the PubMed database until April 14, 2019 were used. On their basis, important information was presented and the incidence of complications of hormonal contraception in smoking patients was analyzed.

Analysis of the literature. Our work includes 10 articles. Current or previous use of oral contraceptives is not associated with an increased risk of heart attack in non-smokers. An increase in the frequency of acute coronary syndromes occurs in smokers who are currently using oral hormonal contraception without additional aggravating factors. Several observational studies have shown that smoking is by far the most important independent risk factor for heart attack among OC users. Even among people not using oral contraceptives, smoking (especially "heavy" smoking, 15 cigarettes a day) increases the risk of a heart attack by 3 to 11 times. However, the combination of smoking hormonal contraceptives is synergistic, increasing the relative risk by up to 30-fold. Smoking has also been identified as an important factor associated with VTE in women using COCs.

Conclusion. In view of the above, it is worth considering the necessity of introducing activities related to raising public awareness of the risk related to the simultaneous use of contraception and smoking. The problem also indicates a huge role of the doctor in changing the lifestyle of patients and introducing appropriate contraceptive treatment, monitoring its course and assessing the risk of complications.

Keywords. contraception, embolism, smoking

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A 16-year-old female patient with Charcot-Marie-Tooth disease in variant c.217G> C of the INF2 gene and focal glomerulosclerosis – case report

Introduction. The aim of the publication is to describe the case of a 16-year-old white patient suffering from Charcot-Marie-Tooth disease in the c.217G> C variant of the INF2 gene and focal glomerulosclerosis. Acquaint the reader with the form, course and molecular knowledge of the disease. Description of pathological changes, possible methods of treatment and rehabilitation based on extensive literature. Increasing awareness and expertise on genetic disorders.

Aim. This is a description of the disease Charcot-Marie-Tooth disease (CMT), which is currently one of the most commonly diagnosed and commonly hereditary sensorimotor neuropathies.

Description of the case. From the turn of the second and third year of life, the patient showed a tendency to walk on tiptoes, this symptom developed through foot drop, weakening of the distal muscles, especially of the lower limbs, until the appearance of contractures. Along with the development of the disease, the patient developed a wading gait. At the age of seven, during hospitalization, an EMG examination was performed, which showed the features of mixed, axonal-demyelinating neuropathy, then congenital motor-sensory neuropathy was diagnosed. In October 2019, apart from a number of abnormalities in the functioning of calcium and phosphate metabolism and urine laboratory tests, advanced nephropathy was diagnosed. During hospitalization, the patient required regular hemodialysis treatments. Despite the implementation of erythropoietin and iron, there was a need for transfusion of the erythrocyte mass twice. Urine red blood cells and urine proteins were present in the urine all the time (3.6 g/day). With a slightly reduced level of protein and albumin in the blood. During the same hospitalization, a biopsy was also performed, the result confirmed the irreversible nature of the kidney damage. A cardiac consultation was also performed, during which secondary hypertrophy of the left ventricular muscle was found. During the neurological consultation, it was found that it was impossible to induce deep reflexes from the lower limbs and a weakly expressed deep reflex from the upper limbs, as well as hollow feet, deformed toes, drooping feet, and stork gait. In September 2020, the patient was admitted to a genetic clinic. The WES / WGS-NGS genetic test was performed. The test sample showed a mutation in the INF2 gene at the chromosomal position hg38 14: 104701582-G> C, cDNA level c.217 G> C, and p. Protein (Gly73Arg). Genotype record according to Human Genome Variation Society: NM_022489.4: c. [217G> C]; [217 =]. This is the first time of its kind.

Description of the literature on the subject: The source of the publications used in the article is the website https://pubmed.ncbi.nlm.nih.gov/ and https://scholar.google.com/

Search words are: Charcot-Marie-Tooth, Neuropathy, Nephropathy, Exome Sequencing, INF2

The publication includes data on genetics, molecular mechanisms of the disease, diagnostic methods, rehabilitation and surgical treatment.

Conclusion. CMT disease is a heterogeneous group of diseases caused by mutations in various genes. The course of the disease is variable due to genotypic and phenotypic heterogeneity. The incidence of this pathology has increased significantly in the last century, which is associated with the dynamic and rapid development of medicine in the field of clinical genetics. There are currently no treatments to combat CMT disease, and symptomatic treatment is the only treatment available. However, patients in Poland can more and more often count on the help of specialists involved in the treatment of diseases related to the human genome. This commitment gives hope for the improvement of patients' clinical condition and psychomotor and social functioning.

Keywords. Charcot-Marie-Tooth, exome sequencing, INF2, neuropathy, nephropathy

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The phenomenon of fluorescence

Introduction. The phenomenon of fluorescence is one of the types of luminescence. It is based on the emission of light by a substance that has been excited by the absorption of a quantum of visible light.

Aim. To present the phenomenon of fluorescence.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. The type of dissolved substance, temperature and pH influence the intensity of fluorescent radiation. It follows from the principle of conservation of energy that the energy of the emitted photon cannot exceed the energy of the incident photon. By absorbing a photon, a molecule excites an electron and goes into an excited singlet state. Light emission occurs during the transition from singlet excited to ground state. The wavelength of the radiation and the emitted wave are due to the Stokes shift. The exposure time is of great importance. The phenomenon of fluorescence lasts only and exclusively during the interaction of the luminescent factor and disappears as soon as it stops. Fluorescence is mainly demonstrated by compounds containing aromatic rings.

Conclusion. Fluorescence is not only used in fluorescent lamps, but has also found an important application in medicine and biomolecular engineering. Used in a variety of research methods as well as security. It can serve as an identifier for various substances and their labeling. Due to the selection of the appropriate substance and the radiation wavelength, fluorimetric methods are often used due to their high sensitivity, selectivity, precision and accuracy.

Keywords. energy, excited state, fluorescence

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Vitamin B12 deficiency

Introduction. Cobalamin or vitamin B12 can be found in animal products. It should be remembered that the human body is not able to synthesize vitamin B12 itself, therefore it must be supplied with food.

Aim. To present the vitamin B12: uses, benefits and food sources.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Vitamin B12 is important for the health and proper functioning of the body. It takes part in important processes inside the body. It is an important substrate for many chemical reactions in the human body. It affects the proper functioning of the circulatory, nervous and digestive systems. Nevertheless, its interaction is so broad that it can cause a wide spectrum of symptoms in all human systems. A vitamin B12 deficiency disorder can be caused by many diseases, e.g. of the stomach, intestines or the immune system. Meat products, fish, cheese, milk, eggs and the like are rich in cobalamin. Inadequate nutrition can also result in insufficient vitamin intake.

Conclusion. Vitamin B12 deficiency results in a serious disruption of the functioning of the entire body, and consequently leads to serious diseases. It may be a direct or indirect cause of the disease.

Keywords. cobalamin, deficiency, vitamin B12

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Light in PDT therapy

Introduction. PDT photodynamic therapy is currently considered one of the most selective methods used in medicine. Light is one of the key elements in PDT therapy. Apart from the photosensitizer and oxygen, it is the basic substrate of the therapy.

Aim. To present the PDT photodynamic therapy.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. The light radiation used in PDT is in the visible light range of 400-700nm. The penetration depth depends on the different wavelengths of the light. Choosing the right light source depends primarily on the dose of light we want to provide, the photosensitizing substance used and the location of the tissue. The parameters should also depend on the patient's pain threshold and the size of the lesions. Normally most tissues scatter light, and when it is saturated with dye, light absorbs it. The irradiation takes place after about 2-72h depending on the selectivity of accumulation in the tissues of the introduced photosensitizer. The PS system absorbs light and initiates photochemical reactions. The energy transfer allows photosensitizers to relax while creating singlet oxygen. Light-tissue interactions include reflection, refraction, scattering, and absorption.

Conclusion. Currently, in clinical medicine, irradiation is used for no more than 10-20 minutes, the total power should be 1W. The power mainly depends on the size of the illuminated area. The mainly used in PDT are lasers, lamps, LEDs, and ILP diodes. Generally, the sources used can be divided into two categories – laser and non-laser.

Keywords. absorption, irradiation, light, PDT therapy, tissue

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Vincamine

Introduction. The theoretical part introduces the basic issues related to the topic of the work. It presents the most important information about the source of our research problem, which is the substance called vincamine.

Aim. The aim of this paper is to familiarize the reader with information on the occurrence in nature and the medical importance of vincamine.

Material and methods. To prepare the poster, we used the information contained in various scientific and popular science publications published in various magazines and websites.

Analysis of the literature. The analysis of the articles cited in the bibliography shows that vincamine is a nootropic substance from the indole alkaloids group. This substance is contained in a plant called Periwinkle, which comes from the toine family. It is a perennial, evergreen shrub with a small habit. The common periwinkle occurs in almost all of Europe. It is often found in forests or thickets, and is also grown in gardens. It is protected in Poland. This nootropic substance from the group of indole alkaloids is widely used in the treatment of disorders such as cerebral circulation disorders or the treatment of memory and learning disorders.

Conclusion. On the basis of the collected information, positive aspects of the alkaline substance vincamine have been proven. It has a wide spectrum of activity and, thanks to its common occurrence in nature, it is easy to obtain.

Keywords. alkaloid, disorder, periwinkle

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Alkaloids – berberine

Introduction. Berberine is one of the alkaloids whose chemical structure contains the isoquinoline system. It has antioxidant and anti-inflammatory properties, has a hypoglycemic effect, therefore berberine has a positive and effective effect in the treatment of cancer of the mouth, uterus, lungs, melanoma and obesity.

Aim. The aim of the poster was to present the structure, occurrence, properties and application of berberine in medicine.

Material and methods. The basis for the poster was information from proven, generally accessible websites.

Analysis of the literature. The structure of berberine includes the isoquinoline system and belongs to the protoberberine type. This relationship occurs, inter alia, in the roots of barberry, common mahogany, goldenseal, and Chinese cork. It lowers lipid levels, has a hypoglycemic effect and inhibits metastasis to healthy tissues. Berberine consumed in large amounts may adversely affect the digestive system, causing diarrhea, constipation, but also gastrointestinal bleeding and liver damage. In addition, it also has a calming, antiemetic and analgesic effect. Due to its properties, it can be used in the treatment of oncology, obesity and Alzheimer's disease.

Conclusion. Berberine has many useful and as yet unexplored properties that can be used in medicine.

Keywords. alkaloids, Alzheimer's disease, berberine, cancer, properties

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Progression of hepatic failure in a patient with lento-hepatic degeneration

Introduction. Lento-hepatic degeneration, also known as Wilson's disease, is a rare genetically conditioned disorder, the essence of which is a defect in the function of the ATPase transport protein (ATP7B). As a result of the mutation, the excretion of copper into the bile is impaired, resulting in copper retention in the liver and, with the disease progressing, also in other organs.

Aim. To present a case report of hepatic failure progression in a patient with Wilson's disease

Description of the case. A 29-year-old patient with diagnosed Wilson's disease, so far under neurological and psychiatric care, was admitted to the ward due to increasing ascites, edema of the lower limbs and general deterioration of well-being. In the interview, the patient confirmed the irregular use of drugs that inhibit the progression of the disease - penicillamine and a zinc preparation. The imaging studies showed a small, cohesive and regenerative structure of the liver with small-nodular contours. Computed tomography showed atelectasis in the right lung and fluid in the right pleural cavity. Laboratory tests revealed an increase in INR, thrombocytopenia, hypoalbuminemia, elevated transaminase activity, and megaloblastic anemia with features of haemolysis. The calculated MELD index was 22. There were no clinically apparent clinical features of hepatic encephalopathy or neurological symptoms specific to Wilson's disease. Empirical therapy was implemented - albumin infusions, diuretics, rifaximin and lactulose. The peripheral edema and ascites were regressed, with no effect on the INR value. Due to the significant degree of liver damage, the patient was referred for liver transplantation.

Conclusion. The proper functioning of the liver in patients suffering from Wilson's disease is possible thanks to drugs increasing copper excretion and reducing its absorption. Treatment must be regular and last for life from the time the disease is diagnosed. Too late diagnosis or intentional discontinuation of medication by the patient leads to a build-up of copper in the body leading to liver failure, as well as the possible need for a liver transplant.

Keywords. lento-hepatic degeneration, liver failure, Wilson's disease

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The diagnostic problem of Juvenile Idiopathic Arthritis – a comparison of X-ray and ultrasound techniques – case report

Introduction. Juvenile idiopathic arthritis (JIA) is a heterogeneous group of diseases characterized by synovial inflammation and is the most common rheumatic complaint in children. To facilitate research and treatment, JIA has been further classified on the basis of the number of joints involved, additional symptoms, family history, and serologic findings.

Aim. This case study aims to show the differences between two methods of medical imaging, which are the X-rays and the ultrasonography in the early differential diagnostics of the JIA. Moreover, it aims to draw doctors' attention to choosing the right imaging option appropriate to the level of disease's advancement.

Description of the case. In this work we have described a case of a 13-year-old girl complaining about a severe pain in the thumb. Based on the radiographical examination, a doctor stated the diagnosis of a sprain of the MCP joint in right hand. The girl was then treated orthopedically – with stabilized and a plaster. Finally, after laboratory tests and US imaging, the right diagnosis was stated – the JIA. The treatment has begun, and soon came the period of remission. Although, after a few years, the disease had struck again, affecting almost every joint in the girl's body. The performed radiograms displayed no irregularities, while US tests have showed severe synovial hypertrophy.

Conclusion. Nowadays, the most common form of tests recommended with symptoms like joint pain is the X-ray imaging, which, in fact, cannot show the first stages of the disease. It only has any diagnostical value in further stages of the illness. The commonly used methods should, therefore, became the US, which allows to observe even the slightest changes in the joints and help to state the right diagnosis.

Keywords. joints, juvenile idiopathic arthritis, US, XRAY

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Lateral orbitotomy as a method of orbital hemangioma removal – case report

Introduction. Primary orbital tumors are rare. One of the most common causes among benign primary orbital tumors are hemangiomas, which are divided into capillary and cavernous. Cavernous hemangiomas occur mainly in adults. The treatment involves surgical excision of the lesion, including the method of lateral orbitotomy. The diagnostic methods to determine the characteristics and localization of the tumor use ultrasound, radiological, magnetic resonance and computed tomography, the latter being the most widely used.

Aim. To present lateral orbitotomy as one of the methods of removing orbital tumors.

Description of the case. A 49-year-old woman is admitted to the hospital with a tumor in the right orbit, diagnosed in computed tomography and confirmed by magnetic resonance. For over half a year, she had been accompanied by headaches, and initially also by dizziness. A lateral orbitotomy was performed in which the tumor was completely excised. Apart from slight and short-term swelling of the eyelids of the right eye, no other postoperative complications were found. In the histopathological examination of the resected tumor, the diagnosis of sinus hemangioma was made.

Conclusion. Depending on the clinical course or location, the methods of treatment may differ and have different effects, while the lateral orbitotomy in the case of benign nodular lesions is a procedure that allows the complete removal of the lesion and full recovery of the patient while maintaining the eye's motor functions and vision.

Keywords. hemangioma, lateral orbitotomy, orbital tumor

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Changes in EEG recording in COVID-19 patients as a basis for more accurate QEEG diagnostics and EEG Neurofeedback therapy – a systematic review

Introduction. The SARS-CoV-2 virus can cause abnormalities in the functioning of the nervous system and induce neurological symptoms with the features of encephalopathy, impaired consciousness and concentration, reduced ability to sense taste, smell and headaches. One of the methods of detecting changes of this type in patients with COVID-19 is an EEG test, which allows information to be obtained about the functioning of the brain, diagnosing diseases and predicting their consequences.

Aim. The aim of the study was to review the latest research on changes in EEG recording in patients with COVID-19 as a basis for further QEEG diagnostics and EEG Neurofeedback training.

Material and methods. Based on the review of the literature with the use of the electronic PubMed database from 2020 regarding changes in the EEG record in patients with COVID-19, 17 items were included in the analysis.

Analysis of the literature. In patients who underwent EEG, changes in the frontal area were observed, some were not found to be responsive to external stimuli, and a previously unheard-of pattern in the form of continuous, slightly asymmetric, monomorphic, biphasic, slow delta waves was also shown.

Conclusion. The results of the analysis clearly show that the SARS-CoV-2 virus causes changes in the nervous system that can be manifested in the EEG test.

Keywords. COVID-19, EEG, nervous system, SARS-CoV-2, training neurofeedback, QEEG

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Edible dogwood – a source of compounds with high biological activity

Introduction. The medicinal properties of dogwood (dogwood Latin: *Cornus mas* L.) have been used in folk medicine for centuries in the prevention and treatment of many diseases, mainly fruit. The high biological activity of the plant results primarily from the presence of valuable ingredients, including anthocyanins, flavonoids and iridoid compounds.
Aim. Presentation of the bioactive components of the plant and its therapeutic application.
Material and methods. Review and analysis of the literature published in 1998-2021. The articles concerned both phytochemical properties and the therapeutic effect of, among others, anticancer, antidiabetic, antibacterial, neuroprotective and cardioprotective.
Analysis of the literature. The literature review was performed by searching PubMed and Science direct data base. High antioxidant activity of dogwood may allow for its potential use to obtain valuable nutraceutical and pharmacological substances. Dogwood fruits, causing, among others, apoptosis and inhibit the division of neoplastic cells.
Conclusions. In the near future, further studies are planned to assess the impact of natural substances present in *Cornus mas* fruits on the cancer cell line.
Keywords. Dogwood, bioactive components, phytochemical properties

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Case of a patient with seronegative axial spondyloarthropathy

Introduction. Seronegative spondyloarthropathies are a family of joint disorders.

Aim. The aim of this study is to present the case of a patient diagnosed with axial seronegative spondyloarthropathy.

Description of the case. The patient's MR images of the cervical, thoracic and lumbar spine are dominated by the presence of areas of marrow edema, inflammatory changes located in the intervertebral joints at different levels, bilaterally and asymmetrically. In the cervical spine, areas of marrow edema are also present in the unicondylar joints and in the posterior parts of the vertebral bodies of C2, C3. Multilevel features of sterile discitis in the thoracic and lumbar spine (at Th4-L4 levels) with extensive lenticular areas of marrow edema in the adjacent vertebral bodies. Features typical of advanced axial seronegative spondyloarthropathy were found. X-rays showed sacroiliac joint changes: sacroiliitis of the 4th degree and thoracic spine: features of quadrature of the vertebral bodies, syndesmophytes – typical changes in the course of AS.

The patient met the modified New York diagnostic criteria for ankylosing spondylitis. The disease activity was high.

Conclusion. The whole picture in joint assessment with inflammation-changed, partially included sacroiliac joints in the examination strongly indicates changes in the course of axial seronegative spondyloarthropathy. The current treatment was modified and material was collected for qualification tests for biological treatment.

Keywords. ankylosing spondylitis, axial seronegative spondyloarthropathy, sacroiliac arthritis

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Analysis of radiation doses during the revascularization of the arteries of the lower extremities using the balloon angioplasty technique using alloon angioplasty

Introduction. Current advances in analysis of radiation doses during the revascularization of the arteries of the lower extremities using the balloon angioplasty technique using balloon angioplasty were described.

Aim. The aim of the study is to analyze radiation doses during revascularization of popliteal arteries and arteries of the lower leg the balloon angioplasty method.

Material and methods. A retrospective analysis of the collected data was performed on 60 patients (30 men – mean age 69.7 years, and 30 women – mean age 78.7 years) with diagnosed stenosis or obstruction of the popliteal artery and the arteries of the lower leg in the course of atherosclerosis. The procedures were performed in an endovascular room equipped with a Philips Allura Xper FD20 angiograph, with the following parameters: 60 kV, 8 mA. The following data were analyzed: age, sex, Body Mass Index – BMI [kg/m^2], duration of fluoroscopy [min], Dose Area Product – DAP [mGyxcm^2], Air Kerma – AK [mGy] and the amount of contrast agent administered [ml]. The statistical analysis was done by using Mann-Whitney's and Spearman's correlation tests.

Results. In the group of men, a statistically significant difference was found between the values of AK, DAP and the amount of contrast agent administered depending on the duration of fluoroscopy, as well as the values of AK and DAP depending on the amount of contrast agent administered.

In the group of women, there was also a statistically significant difference between the values of AK, DAP and the amount of contrast agent administered depending on the duration of fluoroscopy, and only a statistically significant correlation between the value of DAP and the amount of contrast agent administered. All statistically significant relationships are directly proportional, i.e. as the value of one variable increases, the values of the other variable increase. In both groups there was no statistically significant correlation between AK and DAP values, the amount of contrast agent and the duration of fluoroscopy in relation to BMI. Moreover, in the group of women, no statistically significant correlation was found between the amount of contrast agent administered and the value of AK - such a relationship was found only in the group of men.

Conclusion. In both groups: the value of AK, DAP and the amount of contrast agent administered depends on the duration of fluoroscopy, the amount of contrast agent administered affects the DAP value, there was no correlation between BMI and the duration of fluoroscopy; only in the group of men the amount of contrast agent administered affects the AK value.

Keywords. AK, atherosclerosis, DAP, fluoroscopy, revascularization

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Diagnostics of intracranial vein thrombosis

Introduction. Intracranial venous thrombosis is rare. Its clinical presentation is variable and diagnosis requires a high index of clinical suspicion in conjunction with neuroradiological diagnostic support.

Aim. The aim of the study is to present imaging of intracranial vein thrombosis on the basis of a 40-year-old female patient

Description of the case. A 40-year-old patient, not treated chronically, was admitted to the Department of Neurology after an episode of loss of consciousness with convulsions, as a result of which she suffered a head injury. Urgent CT examination without contrast agent showed no changes. During hospitalization, MRI of the test was performed in TSE sequences (T1 - ax. Ax. And ax., Cor. I sag. After contrast enhancement), TSE (T2 - ax., Cor. I sag.), LongTR / FLAIR (T2 - ax.) and DWI (ax.). The lack of access to blood tests in the visible and sigmoid sinus on the left side and the inscriptions on the left side by examination of the internal jugular vein through a structure with slightly heterogeneously elevated signal in the T2- and T1-zal images. During the extraction process, the contrasting process of the extraction of pus is in the vessels in which the clot occurs during the control period, which is the control data for the above-mentioned vessel thrombosis in MR. Due to an abnormal paroxysmal EEG, it was decided to turn on levetiracetam. The patient was discharged home in a good condition, with the recommendation to continue the selected treatment. During the follow-up hospitalization, angio-CT of the cerebral vessels was performed. The analysis showed the lack of contrast in the central part of the sinus of the standard sinus and the sigmoid version on the left side - thrombotic changes of less intensity than 2 months earlier. The diagnostics was extended to repeat the EEG test. Based on the results of the performed tests, it was decided to continue the anticoagulant and antiepileptic treatment as usual.

Conclusion. Angio-CT scan as well as contrast test MRI allows to identify and assess the occurrence of intracerebral vascular thrombosis, while a CT scan without contrast management is not helpful in diagnosis.

Keywords. angio CT, computed tomography of the brain, diagnostics, intracranial vein thrombosis, magnetic resonance imaging

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The use of GLP-1 receptor agonists in the treatment of obesity

Introduction. Obesity is a chronic disease, the essence of which is excessively developed fatty tissue. Its increased amount and secretory activity may contribute to the development of serious health consequences. Weight loss is difficult to achieve by lifestyle changes alone. Therefore, the search for an effective pharmacological therapy that could aid weight loss is ongoing. Already in the 1980s, scientists' attention turned to GLP-1 receptor agonists. So far, it has been proven that GLP-1 stimulates postprandial insulin secretion, inhibits glucagon secretion, delays gastric emptying, reduces appetite, stimulates the proliferation of pancreatic islet β-cells and inhibits their apoptosis.

Aim. Analysis of the results of studies examining the effectiveness of the use of GLP-1 receptor agonists in the treatment of obesity.

Material and methods. Literature review assessing the available knowledge on the topic discussed.

Analysis of the literature. GLP-1 receptor agonists such as exendin-4, semaglutide and liraglutide in the conducted studies showed a positive effect of weight loss in obese patients. In addition to weight loss, GLP1 receptor agonists also showed a beneficial effect on glucose homeostasis.

Conclusion. Clinical trials showed a positive effect of GLP-1 receptor agonists on weight loss in patients with a BMI> 30, without prior type 2 diabetes. Weight loss in the groups treated with GLP-1 agonists was higher compared to the placebo groups.

Keywords. exendin-4, Gila monster, GLP-1, Heloderma suspectum, liraglutide, semaglutide

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Effects of the ketogenic diet on the course of type 2 diabetes

Introduction. Overweight and obesity are one of the main risk factors leading to the development of insulin resistance and type 2 diabetes. Therefore, nutritional therapy to ensure the loss of excess body weight is recommended in clinical practice. The ketogenic diet is a nutritional model, the assumption of which the main source of energy in the consumed food is fats, while carbohydrates are limited and an adequate supply of protein is ensured. One of the effects of using high-fat diets with simultaneous caloric restriction is putting the body into a state of ketosis, characterized by an increased breakdown of adipose tissue.

Aim. Summary of the results of research on the relationship between the use of a ketogenic diet and the clinical status of patients with type 2 diabetes.

Material and methods. A review of the literature available in the PubMed and Google Scholar databases, summarizing the available knowledge on the topic addressed.

Analysis of the literature. The use of a ketogenic diet has shown a positive effect on weight loss and an increase in insulin sensitivity in the group of patients with type 2 diabetes. It has also shown a positive effect on the level of glycemia, lipid profile, and reduction of glycated hemoglobin.

Conclusion. The ketogenic diet can be used as part of comprehensive therapy in the treatment of obesity and type 2 diabetes. Its introduction at an early stage of the disease seems to be particularly promising. However, due to its eliminative nature, it may be difficult to implement and apply correctly. The possible side effects occurring during the first period of the diet should also be taken into account.

Keywords. ketogenic diet, obesity, type 2 diabetes

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Imaging of non-accidental bone injury in a child – a case report – non accidental bone injury in 2.5-year-old girl

Introduction. The most common sites for non-accidental injury are: mouth, shoulders, chest, upper and inner arms. Physical abuse (non-accidental injury) can be a difficult diagnosis for physicians to consider.

Aim. The aim of the study is to present the role of imaging in the assessment of non-accidental skeletal injury based on the case of a 2.5-year-old girl.

Description of the case. A 2.5-year-old girl admitted to the Department of Paediatrics and Orthopedics after intervention in the family home with suspected beating. On admission, the child is restless, crying, on physical examination, fresh hematomas and ecchymoses, abrasions of the epidermis, small skin scars and limited mobility of the right lower limb are present in many places. The unclear explanation of the causes of the accident and the presence of lesions on the skin raised the suspicion that it was a non-accidental injury X-ray examination of the lower legs showed fractures with displacement and angular positioning of the metaphyses of the distal tibia bones of both lower extremities, fracture of the fibula of the lower right limb, subperiosteal fracture of the distal epiphysis of the lower limb left. An additional supracondylar fracture of the right femur was visualized with a slight displacement of the fragments and the presence of repair reactions. Due to the unclear explanation of the cause of the injury by the caregivers and the bruises on the integuments, an ultrasound examination of the abdominal cavity was performed, which did not reveal any other lesions suspected of being associated with a non-accidental injury. CT examination in the polytrauma option – no other injuries were present. Laboratory tests revealed increased peripheral blood leukocytosis, elevated levels of d-dimers and troponin.

Conclusion. In the case of fractures of the lower limbs, numerous hematomas, a non-accidental bone injury can be suspected. To find changes in the parenchymal organs, additional X-ray examinations of the abdominal cavity or CT in the polytrauma option are performed. They are important for identifying changes typical for this type of injury. In the discussed case – multi-site epiphyseal fractures.

Keywords. CT, examinations, X-ray,

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The role of imaging diagnostics in the diagnosis of complicated inflammation of the right hip in an 8.5-year-old patient

Introduction. Early diagnosis of the complications of pancreatitis may be established almost uniformly.

Aim. The aim of the study is to present the case of an 8.5-year-old patient with complicated inflammation of the right hip joint.

Description of the case. An 8.5-year-old patient was admitted to the hospital, after about 9 weeks of pain in the right knee joint and limited mobility in the right hip joint, for diagnosis of right hip joint inflammation. Two months earlier, an ultrasound and MRI had been performed in another center. Ultrasound examination of the right hip joint showed effusion and swelling of the synovium in the anterior recess up to 15mm thick, and up to 12mm in the posterolateral area. MRI showed effusion in the right hip joint. Based on the image of the femoral head, Perthes disease was suspected.

X-ray of the lower leg was performed including the knee joints and X-ray of the hip joints, which showed that the medial condyle of the right femur and in the part of the shaft located above it there is a visible area of slightly increased transparency, poorly delimited - in the course of bone loss for differentiation: eosinophilic granuloma? infection? early form of the proliferative process? On the other hand, in the hip joint, a slight periosteal reaction was described in the area of the neck of the right femur and marked bone loss of the proximal end of the right femur. Laboratory tests were performed, which showed vitamin D3 deficiency, slightly increased level of immunoglobulins in the IgA class and increased inflammatory parameters. A CT scan of the hip joint was performed with contrast agent, in which an osteolytic focus of approx. 10x9 mm in the shaft of the right iliac bone was described, partially surrounded by sclerotization, with a rupture of the cortical layer from the side of the joint cavity. A similar, smaller focus (max. 6 mm) was visualized near the shaft of the right ischium. Irregular calcifications are visible in the joint cavity near the osteolysis foci. A CT scan of the right knee joint showed marked signs of osteoporosis in the distal end of the right femur. In order to extend the diagnosis, it was decided to perform MR of the hip joint with contrast enhancement. The image showed inflammation, in addition, a focus of the size of the acetabulum was described in the top of the acetabulum in the right iliac bone. max. 8 mm with a fluid signal, undergoing marginal enhancement in contrast to the narrow canal, communicating with the joint cavity - an abscess was suspected. It was decided to undergo surgery to remove the abscess. Anti-inflammatory treatment and vitamin supplementation were also used. D3. Control X-ray examinations were performed after 3 and 6 months, and then after 9 months, MR of the right hip joint with the use of a contrast agent, which showed a cystic lesion within the ischial shaft. On the basis of the examination, a diagnosis of hip joint inflammation was made with the suspicion of the development of an aneurysm cyst within the sciatic acetabulum.

Conclusion. Imaging diagnostics in the form of MRI allowed for the diagnosis of inflammation of the right hip joint, the complication of which was the development of an aneurysm cyst within the sciatic part of the acetabulum.

Keywords. aneurysm cyst, computed tomography, diagnostics, magnetic resonance imaging, surgical treatment

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The role of B lymphocytes in neurological and rheumatic diseases

Introduction. B lymphocytes also known as B cells are a type of the lymphocyte subtype of white blood cells. They function in the humoral immunity component of the adaptive immune system. The role of B cells in various diseases is the subject of research.

Aim. The aim of this study is to present the role of B lymphocytes in selected neurological and rheumatological diseases.

Material and methods. The literature review of the PubMed database, national and international articles from the years 2012-2021 regarding the subject matter was made.

Analysis of the literature. The results of analyzed research studies indicate that B cells have different roles in chosen neurological and rheumatological diseases. Their main role is not only to produce antibodies but also to contribute to the development of the disease. They activate pro-inflammatory cytokines, present antigens, and regulate the activation, differentiation, and function of dendritic cells while some subgroups of B cells produce cytokines, which suppresses the immune system. This group of cells is regulatory B cells, the number of which is reduced in autoimmune diseases.

Conclusion. B lymphocytes play a fundamental role in the pathogenesis of neurological and rheumatic diseases. Further to the above, progress could be made in the treatment of various diseases by manipulating B cells' functions.

Keywords. immunology, lymphocytes B, neurology, pathogenesis, rheumatology

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Laryngeal lipoma – a rare but important cancer of the respiratory system

Introduction. Lipomas constitute 5% of benign neoplasms and at the same time are the most common among mesenchymal neoplasms. These changes are usually single, painless, and shifting in relation to the skin and the ground. They grow slowly, most often they are encapsulated and include the subcutaneous tissue. The results and prognosis after total excision is good, and recurrence is rare. Laryngeal lipomas are rare.
Aim. The aim of our work is to present a case of a patient with a rare lipoma of the larynx.
Description of the case. In our work, we present a description of a patient with a lipoma of the larynx – a 24-year-old man who was admitted to the Department of Otorhinolaryngology in Rzeszów due to sore throat while swallowing and hoarseness persisting for 4 weeks. Physical examination revealed a neck tumor in the area of the thyroid cartilage on the left side, and in indirect laryngoscopy a protrusion of the left atrial fold obscuring the left vocal fold. The performed tomographic examination showed the presence of a sharply contoured mass with a structure characteristic of adipose tissue
in the left-lateral part of all levels of the larynx. The change contained a large complex component
from adipose tissue. Histological examination of the tissue collected for examination during laryngeal microsurgery showed aggressive growth of adipose tissue within the skeletal muscle and revealed minor foci of degeneration with the presence of a few atypical lipoblasts. The patient was qualified for complete removal of the tumor from the access by laryngectomy.
Conclusion. Lipomas are one of the most common soft tissue neoplasms in adults. The change in the initial period may not cause disease symptoms, over time, however, oppression occurs with tumor growth and certain locations on surrounding tissue, which may result in life-threatening symptoms.
Keywords. larynx, lipoma, mesenchymal neoplasms

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Sulfonylurea poisoning mimicking vertebrobasilar acute ischemic stroke

Introduction. So far, only about 10 cases of hemiparesis or tetraparesis caused by sulfonylureas induced hypoglycemia were described (including only one case with persistent neurological deficits after sugar level alignment).

Aim. The aim of our study was to describe the case of the man with sulfonylurea induced hypoglycemia manifesting as acute encephalopathy with focal neurological signs misdiagnosed as posterior circulation acute ischemic stroke (AIS).

Description of the case. A 64-year-old patient treated with glimepiride (2 BID) for type II diabetes mellitus, after radical prostatectomy for prostate cancer, was admitted to Stroke Unit. Upon admission, patient was unconscious, with upward gaze deviation, four-limb paresis, extensor response to pain, bilateral positive Babinski's sign. Non-contrast head CT and CT-angiography did not reveal any abnormalities. Low serum glucose level (46 mg/dl) was noted and corrected with intravenous glucose infusion (80 mg/dl). Based on acute onset of focal neurological signs the initial diagnosis of AIS was made. Due to exceeding of treatment window, no reperfusion therapy was performed. In further serum glucose measurements hypoglycemia was noted. For the next 72 hours repeated intravenous glucose infusions were needed to maintain its levels above 70 mg/dl. Magnetic resonance head imaging performed in 3rd and 7th day did not reveal ischemic changes. Hypoglycemic encephalopathy due to glimepiride poisoning was diagnosed.

Conclusion. In our case, preoperatively taken sulfonylureas resulted in prolonged hypoglycemia misdiagnosed as AIS. Prolonged insufficient brain nutrition can result in permanent or long-lasting brain damage, manifesting itself as impaired consciousness and focal neurological signs.

Keywords. glimepiride, hypoglycemia, poisoning, sulfonylurea

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Diabetes mellitus and its complications – a painless fracture of a finger

Introduction. Diabetic neuropathy can manifest itself in many ways. It can take the form of, for example, acute inflammation of the peripheral nerves, amyotrophy or vegetative neuropathy. It is one of the most common complications of diabetes (it may affect up to 66% of diabetic patients).

Aim. The aim of our study is to present a case report of a patient who, due to the advanced symmetrical peripheral diabetic polyneuropathy, was not aware of the fracture of the fifth finger of the left hand.

Description of the case. A 53-year-old patient developed type 1 diabetes in the age of 9, and since 2004 he has been under the constant supervision of a diabetologist. Even then, he had advanced complications of diabetes in the form of proliferative retinopathy. In the further course of the disease, due to non-compliance with medical recommendations and poor metabolic control (over the last 15 years, the percentage of glycosylated hemoglobin did not fall below 8.1%, reaching 11.1% in May 2017, and during the last study in April 2019 it was 10.0%), in the following years he developed further complications such as ischemic heart disease, complete blindness of the right eye (as a result of retinopathy progression), diabetic nephropathy and advanced peripheral neuropathy.

In February 2019, in the morning, the patient suffered a fractured finger while unscrewing the fuel filler cover in a car. He remained unaware of this fact all day due to the absence of any pain symptoms. Only in the evening he noticed the wrong positioning of the fifth finger of his left hand. The next day, he felt painful pressure and the swelling deepened, prompting him to visit the emergency room. There, an X-ray examination was performed which showed a fracture of the phalanx shaft of the left fifth proximal finger. A recent electromyographic examination confirmed the existence of a very advanced peripheral neuropathy in the man.

Conclusion. In summary, improperly treated, poorly controlled type 1 diabetes has serious consequences. It is very important that people suffering from it regularly check blood glucose levels and lead a healthy lifestyle - follow a proper diet and do not forget about physical activity adapted to their abilities. Neglecting the proper treatment may lead to irreversible complications, such as in the case of the patient described by us, in whom peripheral diabetic polyneuropathy led to painless fracture of the finger.

Keywords. diabetes, HbA1c, neuropathy

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How does COVID-19 affect the heart?

Introduction. Early in the pandemic, epidemiologists made a striking observation. Compared to the general population, people with cardiovascular disease (CVD) were more than twice as likely to contract severe forms of COVID-19. In the last six months, death rates from COVID-19 have dropped significantly, but CVD remains a major predictor of poor outcome. What have we learned about heart disease and COVID-19 in that time?

Aim. To present the influence of COVID-19 on heart muscle.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. A study recently published in the Journal of the American College of Cardiology definitely shows that in COVID-19 patients who develop heart failure, the virus infects heart muscle cells. It turned out that in the cells there is the coronavirus spike protein and its genome envelope. The cells in the heart have angiotensin converting enzyme-2 receptors where the coronavirus attaches before entering cells. Heart damage can also be due to high levels of inflammation circulating in the body. Experiments have also shown that the coronavirus can penetrate and replicate in cardiomyocytes (heart muscle cells), but it does not infect e.g. endothelial cells. Therefore, the goal is to understand that COVID-19 has a significant impact on cardiovascular disease, and to understand how heart muscle damage occurs, so that we can prevent or treat it.

Conclusion. It is important that everyone takes this virus seriously and makes every effort to take precautions to contain it from spreading. All this is to prevent an even greater epidemic of heart disease in the future.

Keywords. COVID-19, heart muscle, injury

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Rhombencephalitis on the background of Lyme disease – case report

Introduction. Lyme borreliosis is an infectious disease, caused by a Gram-negative bacterium of Borrelia species, which are spread to humans by the bites of infected ticks of the genus Ixodes. The most common sign of infection is erythema migrans, which occurs in 1-4 weeks after the tick bite. Neurological signs can be noticed soon after infection or be delayed for months or years. They can relate to both central and peripheral nervous systems. Rhombencephalitis refers to inflammation of the brainstem and cerebellum. It has a variety of etiologies, which include viral or bacterial infections, autoimmune disease, and paraneoplastic syndromes. Infectious rhombencephalitis is most commonly caused by *Listeria monocytogenes* and only incidentally by *Borrelia species*.

Aim. This work aims to show that *Lyme borreliosis* can be one of the reason of rhombencephalitis.

Description of the case. We herein report a case of rhombencephalitis caused by Lyme disease in a 66-year-old man. The patient with no relevant medical history was admitted to the Neurology Department with dizziness, imbalance, and impairment of memory lasting for approximately 2 months. At admission mildly reduced level of attention and nystagmus were noted. Brain MRI revealed bilateral subcortical hyperintense foci in the fronto-parietal area on the T2 images and cortical atrophy of the cerebellum. CSF examination revealed cytosis 79mm^3, the glucose level was 91 mg/dl, total protein was 111 mg/dl. Based on neuropsychological tests which revealed cognitive impairment and on positive CSF anti-borrelia antibodies rhombencephsalitis was suspected and treated with a 28-day course of ceftriaxone and methylprednisolone iv pulses for 5 days. After 3 months significant improvement of neurological status was noted and brain MRI showed almost complete regression of the previously described changes.

Conclusion. Various causes of brainstem encephalitis have been described previously, but rhombencephalitis triggered by Lyme disease is only rarely encountered condition. It should, however, be taken into consideration in the differential diagnosis of subacute consciousness disturbances, especially in endemic areas.

Keywords. borreliosis, brainstem, neurology, rhombencephalitis

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Measurement of the ability to slow the sinus rhythm in identifying patients with paroxysmal atrial fibrillation dependent on the voltage of the parasympathetic nervous system

Introduction. Pulmonary vein isolation (PVI) is a well-established method of atrial fibrillation (AF) ablation. Unfortunately, the long-term effectiveness of PVI is quite often below expectations, and PVI itself is invasive and quite expensive. It is believed that vasovagal AF can be treated by weakening the enhanced parasympathetic component, and this effect can be achieved with selective cardioneuroablation (CNA), radiofrequency catheter ablation (RFCA) of the right anterior ganglion parasympathetic (right anterior ganglionated plexus – RAGP). However, there is a lack of data on the possibility of identifying potential candidates for this minimally invasive method
Aim. To initially determine the applicability of sinus rhythm deceleration capacity (DC) to identify patients with AF that may benefit from selective CNA.
Material and methods. The study included consecutive male patients in whom increased parasympathetic tone was determined using DC calculated from 1 minute of resting ECG. DC values>7 ms were considered to correspond to the increased activity of the parasympathetic system. Then, the RAGP localization was determined anatomically defined as the posterior septal area of RA below the superior vena cava (SVC) by fluoroscopy. The goal was to accelerate the heart rate (HR) by> 30% on an electrophysiological ECG. Clinical observation consisted of regular visits combined with interviewing and performing a 12-lead ECG and Holter ECG.
Results. Nine consecutive patients (age 52±13 years) of paroxysmal AF with DC>7 were identified. With the help of RFCA, CNA RAGP was performed in all identified patients. The mean RF time was 147±85s, the maximum power was 34 ± 8W, and the total treatment time was 60±29min. An increase in HR> 30% was achieved in 8 (89%) patients (pre-RF vs post-RF: 58±8bpm vs 87±12bpm, p=0.00002). Transseptal access to achieve RAGP with LA was obtained in 2 (22%) patients (transseptal puncture – 1, patent foramen ovale – 1). There were no complications. During the follow-up, antiarrhythmic drugs were discontinued in 8 (89%) patients. During the follow-up, recurrences of AF occurred in two patients. 6 (67%) patients were using β-blockers due to persistently elevated HR, and this treatment was well tolerated by all patients.
Conclusions. DC may be helpful in identifying patients with AF associated with increased parasympathetic tone. In these identified patients, RAGP ablation without PVI is feasible and may prevent recurrence of AF. Acceleration of HR after CNA can be well controlled with β-blockers and is usually not associated with any significant symptoms. The role of CNA in the treatment of vasovagal AF requires prospective research.
Keywords. atrial fibrillation, pulmonary vein isolation, sinus rhythm

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Diagnostics of Crohn's disease

Introduction. Crohn's disease is a chronic (often relapsing) inflammatory bowel disease. Officially, it has been known in the medical community since 1932. In order for a doctor to be able to take the best therapeutic and therapeutic path, accurate and unambiguous diagnosis is necessary. In the case of Crohn's disease, the range of diagnostic tools is quite wide, but new possibilities are still being searched and implemented. Over the years, the so-called The "golden" solution is magnetic resonance imaging.

Aim. The aim of the study was to analyze Crohn's disease magnetic resonance imaging.

Material and methods. The literature review was prepared on the basis of the databases contained in the International Medical Library PubMed, the specialized search engine Google Scholar, and on the basis of the ScienceDirect scientific literature platform. The articles for the review were used from all three sources and selected on the basis of abstract analysis and the availability of the entire material/publication. The publications concern current research by scientists and research groups in the field of diagnostics of inflammatory bowel diseases on the example of Crohn's disease.

Analysis of the literature. The work (in the form of a graph) presents the number of written publications on Crohn's disease (in the English nomenclature known as Crohn's disease) over the years 1941-2021 recorded in the PubMed database. Additionally, on the basis of the literature review, the most frequently detected changes during intestinal MR examination were analyzed.

Conclusion. Magnetic resonance imaging of the digestive system has evolved over the years. The phenomenon of this tool in the study of the intestines continues to surprise doctors and scientists. Although the examination is time-consuming and requires high competence of personnel - the obtained images are accurate and precise. The examination requires the administration of a contrast agent, but the likelihood of side effects is low. Thanks to the conducted research in the field of diagnostics of intestinal inflammatory changes, MR enterography can be constantly developed.

Keywords. Crohn's disease, inflammatory bowel disease, magnetic resonance imaging

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Linalool

Introduction. Linalool is classified as a monoterpene alcohol found in many flowers.

Aim. To present the properties of linalool and its influence on the functioning of the human body.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Linalool exists in two enantiomeric forms, S- and R-linalool, which differ in their olfactory and physiological properties. (S)-linalool is found as a major constituent of the essential oils of coriander (*Coriandrum sativum* L.), and sweet orange (*Citrus sinensis*) flowers. On the other hand, (R)-linalool is present in lavender (*Lavandula officinalis*), bay laurel (*Laurus nobilis*), and sweet basil (*Ocimum basilicum*). Linalool is used as a scent in about 70% of perfumed hygiene products and cleaning agents including soaps, shampoos, and lotions. Linalool exhibits several biological activities such as antibacterial and antifungal properties. In addition, the antihyperalgesic, antioxidant, anti-inflammatory and anticancer effects of linalool in different animal models have been established. However, essential oils derived from linalool leaves, herbs and flowers may cause allergies in people who are hypersensitive to this compound.

Conclusion. Since its discovery, linalool has been extensively researched, however, most research is fragmentary and unclear in a few wider studies.

Keywords. commercial applications, essential oils, linalool

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Pinene – uses and properties

Introduction. Pinene is a bicyclic monoterpene chemical compound. There are two structural isomers of pinene found in nature: α-pinene and β-pinene

Aim. To present the properties of pinene and its influence on the functioning of the human body.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Both forms differ only in boiling, melting and flash points. The chemical properties are practically the same in both cases. However, these two phytochemicals exhibit diverse biological activities, leading them to various applications and uses, such as fungicidal agents, flavors, fragrances, and antiviral and antimicrobial agents. Pinene is produced by a wide variety of conifers, but not only by them. The antiseptic properties of both forms of pinene have also been demonstrated, thanks to which it was used as a natural antibiotic in ancient medicine. A wide range of pharmacological activities have been reported, including antibiotic resistance modulation, anticoagulant, antitumor, antimicrobial, antimalarial, antioxidant, anti-inflammatory, anti-*Leishmania*, and analgesic effects. In chemical industry, selective oxidation of pinene with some catalysts gives many compounds for perfumery, such as artificial odorants.

Conclusion. Although several *in vivo*, and more recently, few clinical studies have assessed the pinenes biological effects, further efforts are needed to improve knowledge in this area.

Keywords. α-pinene, β-pinene, pharmacological activities

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Alkaloids – Quinidine and Quinine

Introduction. Quinine and quinidine are alkaloids obtained from the bark of a quinine tree (additionally, quinidine can be obtained synthetically) with the formula $C_{20}H_{24}N_2O_2$, quinidine is the right-handed isomer of quinine.

Aim. To present the properties of quinine and quinidine and their influence on the functioning of the human body.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. In history, quinine is the first drug for malaria, but due to a number of side effects, such as visual and hearing impairment, it has been gradually replaced. It has also found application in the pharmaceutical industry as, for example, an ingredient in anti-influenza and analgesic drugs, as well as in the form of quinine chloride in the food industry because it has a bitter taste. Quinidine tonic is subject to the phenomenon of fluorescence. On the other hand, quinidine is the oldest antiarrhythmic drug, it has a significant effect on the work of the heart, its mechanism of action is, among others, reducing the sensitivity of the sinus node. Therapy with its use may cause cardiac disorders, e.g. ventricular fibrillation

Conclusion. Both alkaloids have a broad spectrum of activity, but their use can cause unwanted side effects.

Keywords. alkaloids, drug, heart disorders, poison, quinidine, quinine

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Mondor's disease – phlebitis with the appearance of iron threads

Introduction. Mondor's disease, also known as iron-thread-like phlebitis, is a rare condition which involves thrombophlebitis of the superficial veins of the breast and anterior chest wall.

Aim. The aim of the study is to present information on Mondor's disease on the basis of available scientific publications

Materials and methods. This work uses the scientific literature available until May 10, 2021.

Analysis of the literature. Mondor's disease is characterized by pain, swelling, and redness in the affected area. The lesions typically involve the vessels of the chest wall, less frequently the penile vessels or the upper extremities. The etiology of the disease is not fully understood, but it is known that it may be caused by local injuries or surgeries, and it may accompany cancer or infections. So far, about 500 cases have been described in the literature, but it is suspected that it occurs much more often than reported due to the oligosymptomatic course, and also very often the lack of awareness of this disease.

Conclusion. Iron-thread-like phlebitis is probably underestimated. Raising awareness of this condition may facilitate the diagnosis and diagnosis of Mondor's disease and reduce unnecessary diagnostic procedures.

Keywords. Mondor disease, Mondor's disease, thrombophlebitis of superficial vein

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Properties of black cumin oil

Introduction. In nature, black cumin (*Nigella sativa* L.) occurs in southern Europe and in the western part of Asia. In Poland it is rarely cultivated and temporarily going wild. It appears as a crop weed, also in ruderal areas.

Aim. Properties of black cumin oil are described in this work.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. The main compounds of black cumin oil included p-cymene, thymoquinone, α-thujene, longifolene, β-pinene, α-pinene and carvacrol. Black cumin is used in the treatment of diseases of the upper respiratory tract and liver, as well as in skin diseases. It is used in various types of allergies. So far, numerous studies demonstrated the seed of *N. sativa*, to be medicinally very effective against various illnesses including different chronic illness: neurological and mental illness, cardiovascular disorders, cancer, diabetes, inflammatory conditions, and infertility as well as various infectious diseases due to bacterial, fungal, parasitic, and viral infections. The seeds have a bitter taste similar to coffee. It is a commonly used spice in Indian cuisine. Ground black cumin seeds were once used as a substitute for ground pepper. Today, black cumin seeds are eagerly added to bread.

Conclusion. The high levels of bioactive compounds from black cumin oil are of importance in nutritional applications.

Keywords. black cumin, nutritional applications, pharmacological activities

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Neurological diagnosis based on the examination of the cerebrospinal fluid

Introduction. Cerebrospinal fluid (CSF) is a functional material for analytical research. Its analysis is increasingly used in the diagnosis of neurological diseases. The CSF examination is an integral part of the general study aimed at making the correct diagnosis in infectious or autoimmune diseases, in which the parameters of the cerebrospinal fluid are analyzed at the cellular level.

Aim. The aim of the study was to analyze spectroscopic spectra of CSF samples.

Material and methods. The research material consisted of 2 ml samples of the cerebrospinal fluid collected from the patient. The measurement was carried out on a 1.5 Tesla MRI. The spectra were generated in the GE Healthcare SAGE program.

Results. The paper presents the spectroscopic spectra obtained during the MRS examination of the cerebrospinal fluid. After the initial comparative analysis of the spectra of the patient sample with the CSF standard sample, all identified metabolites were presented in the form of two summary tables.

Summary. On the basis of the obtained results, lipids and lactates were observed in the spectrum of the CSF sample taken from the patient in comparison with the standard spectrum, the presence of which may indicate ongoing inflammation.

Conclusion. The technique of magnetic resonance spectroscopy can be a kind of complementary tool in general diagnostics not only of the central nervous system.

Keywords. cerebrospinal fluid, diagnosis, magnetic resonance imaging

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The use of modern materials in prosthetics

Introduction. The development of technology allows for the improvement of existing methods of treatment and rehabilitation.

Aim. This poster presents selected techniques that are under development and give hope for new treatment options in the near future.

Material and methods. This research was conducted base on literature review.

Analysis of the literature. Scientific reports show that in the future it will be possible to treat diseases and defects in the present, for which we are currently without the possibility of causal treatment and we are conducting symptomatic therapy.

Conclusion. A wide variety of materials are used to create the actual limb, including acrylic resin, carbon fiber, thermoplastics, silicone, aluminum, and titanium.

Keywords. modern materials, prosthetics, technology

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The phenomenon of luminescence and its application in medical science

Introduction. Luminescence is the phenomenon involving absorption of light at a specific wavelength by a chemical molecule (the excitation wavelength) and the emission of light at a longer wavelength (the emission wavelength).

Aim. The paper presents an overview of techniques and applications using the phenomenon of luminescence and its types.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. The use of the phenomenon of luminescence in medicine offers a wide range of observations of biological structures. Luminescence can be used for drug tracking in the body, virus detection and analytical methods. It allows you to diagnose and understand cellular processes in real time.

Conclusion. Technological progress has contributed to the development of innovative techniques in biological and medical sciences using spectroscopic methods.

Keywords. application, luminescence, medical science

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The tested object and its influence on the determination of the time T1

Introduction. Magnetic resonance imaging is one of the diagnostic methods that allow the imaging of anatomical structures in a way that is unattainable by other types of research. Like any computed tomography, magnetic resonance imaging has its limitations related to technology and physical barriers.
Aim. The paper presents the results of the influence of the partial volume on the measurement and determination of the longitudinal relaxation time T1.
Material and methods. Work with phantom.
Results. The presented results clearly show the effect of the location of the test layer on the border of two media significantly different in time T1 and the negative impact of averaging on the result of time T1.
Conclusion. diagnostic methods, imaging, T1
Keywords. MR, relaxation times, T1

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Multi-energy tomography – design solutions from leading companies

Introduction. Computed tomography (CT) technology has rapidly evolved since its introduction in the 1970s. It is a highly important diagnostic tool for clinicians as demonstrated by the significant increase in utilization over several decades.
Aim. The aim of the study was to present the principles of operation of CT systems in order to carry out multi-energy research.
Material and methods. Implementation methods based on single and double lamp-detector units were discussed.
Results. The scans of the phantom are presented, which allow to visualize the benefits of reducing metal artifacts (hip prosthesis) by the multi-generic method. The benefits of this diagnostic method for patients with urological and cardiological diseases are shown. Particular emphasis was placed on discussing the differences in the operation of the systems that occur in the solutions of global manufacturers of CT systems.
Conclusion. In recent years, technological advances in sources, detectors, electronics, and mechanics have driven the development of CT imaging.
Keywords. computed tomography, multi-energy tomography, tomography

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The use of magnetic resonance imaging in breast cancer cell culture imaging

Introduction. The application of magnetic resonance imaging (MRI) is widely used in clinical diagnostics in in vivo research. Over the past several decades, MRI has been one of the most popular and accurate diagnostic methods.

Aim. The aim was to apply MRI is widely used in clinical diagnostics in in vivo research.

Material and methods. MRI measurements at 1.5 Tesla.

Analysis of the literature. MRI enables the acquisition of data and morphological, functional and metabolic information on the sample being tested. In experimental studies, MRI is used, inter alia, to determine the longitudinal and lateral relaxation times, T1 and T2 mapping in in vitro and in vivo tests. In recent years, we have seen an increasing number of cases of breast cancer. The role of HER receptors in the pathogenesis of breast cancer plays an important role. The HER receptor family includes the following receptors: HER1, HER2, HER3, HER4. Too many copies of the ERBB2 gene encoding the HER2 protein affect its overexpression in the cancer cell. This type of HER2 overexpression is found in 25% of breast cancer cases. Overexpression of the HER2 receptor influences the course and treatment of breast cancer, results in a worse prognosis, and significantly influences the aggressiveness of the course of the neoplastic disease. Immunotherapies used in treatment are most often based on monoclonal antibodies such as, for example, Trastuzumab of the IgG1 class, which has a therapeutic effect against the positive domain of the HER2 receptor. Currently, it is believed that the biological medicine Trastuzumab is effective only in patients whose cancer over-expresses HER2. Unfortunately, the exact mechanism of action of Trastuzumab is unknown. Research with the use of a 1.5 Tesla magnetic field and optimization of the methodology may contribute to obtaining a resolution at the cellular level.

Conclusion. The developed drug effectiveness monitoring allows for the assessment of interaction with a cancer cell and the development of a new drug, qualitative and quantitative monitoring of the condition of the cells and the evaluation of the effectiveness of the drug.

Keywords. cell culture, drug delivery, MRI, Trastuzumab

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New methods of generating singlet oxygen in PDT

Introduction. Generation of reactive oxygen species (ROS) takes place through the interaction of photosensitizers with light radiation of the appropriate wavelength. The ROS formed in this way is characterized by wide utility and highly effective in photodynamic therapy (PDT) of various types of cancer and skin diseases.

Aim. The aim was to use PDT to deep tissue tumor.

Material and methods. This research was conducted base on literature review.

Analysis of the literature. Understanding singlet oxygen production contributed to the development of PDT and its subsequent use in the fight against cancer. PDT has limitations that prevent it from being used to treat cancers deep within the body. The limited depth of light penetration through biological tissues limits the initiation of PDT action in deep tissue. The phenomena of bioluminescence (BL) and chemiluminescence (CL) seem to be helpful in solving the problem of delivering light to deep areas.

Conclusion. The development of research on BL and CL may contribute to the improvement of PDT and enable the generation of ROS in any selected place in the body.

Keywords. bioluminescence, chemiluminescence, PDT, singlet oxygen

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Adropine – structure, properties and influence on the human body

Introduction. Research on new substances regulating metabolism led Kumar and colleagues in 2008 to isolate a new peptide – adropine, made of 76 amino acids. This protein is encoded by the energy homeostasis-associated gene *(ENHO)*, the expression of which has been described in the liver and brain.
Aim. Presentation of the structure, properties and influence on the human body of adropine.
Material and methods. Review and analysis of the literature published in PubMed.
Analysis of the literature. The name adropine comes from the Latin words *adura* – ignite and pinquis – fat, oil, which may indicate its important role in the regulation of lipid metabolism. Adropin is a peptide that plays a role in maintaining the metabolic homeostasis of the body, and its high concentration reduces the risk of metabolic syndrome leading to type II diabetes, obesity, polycystic ovary syndrome or non-alcoholic fatty liver disease. A significant effect of adropine on the maintenance of normal endothelial cell function has been demonstrated. It stimulates the expression of nitric oxide synthase genes by activating the VEGFR2 receptor, thus regulating the bioavailability of nitric oxide, which results in its protective effect on the endothelium and possible participation in inhibiting the progression of atherosclerosis. The level of adropine can be used as a prognostic factor for many cardiovascular diseases. Its low concentration has been shown to correlate with disorders such as acute myocardial infarction, stable coronary disease or cardiac syndrome X. Adropin, by stimulating the migration and differentiation of endothelial cells, promotes angiogenesis, shows neuroprotective effects and stimulates endothelial cells to synthesize neurotrophic factors.
Conclusion. Research on the exact action of adropine and its potential use in modern diagnostic and treatment methods is still ongoing.
Keywords. adropine, lipogenesis, metabolic syndrome, vascular endothelium

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Cervical cancer

Introduction. Cervical cancer is a cancer arising from the cervix. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body.
Aim. The presentation draws attention to the topic related to the incidence of cervical cancer.
Material and methods. Review and analysis of the literature published in PubMed.
Analysis of the literature. In Poland, it is slowly but steadily decreasing. In 2017, 2,502 new cases were reported. This places this neoplasm in 8th place in the order of cancer incidence in women. As the incidence decreases, so does the number of deaths. Women under the age of 20 they rarely get this cancer, but the incidence increases with age. Most often, middle-aged women (45-65 years old) suffer from cervical cancer. One of the most common causes of cervical cancer is infection with the human papillomavirus (HPV), especially HPV-16 and -18. As oncogenic HPV viruses are the cause of almost 90% of all cases of cervical cancer, vaccination against HPV is the most effective method of protection against this type of cancer.
Conclusion. To promote early detection of cervical cancer, knowledge, attitudes and practices must be improved to enhance clinical practices and medical student training guidelines or protocols for this cancer.
Keywords. cervical cancer, HPV, neoplasms

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Ads and food choices of people aged 18-30

Introduction. The trend related to healthy eating has gained in popularity in recent years. Despite the fact that access to healthy food is very easy, many people choose highly processed products. Our food choices can be influenced to a large extent by advertisements that provide us with newer and newer solutions for sandwiches, quick dinners or other highly processed products or dishes.

Aim. To assess the impact of food-related advertisements on the dietary choices of people aged 18-30. Checking whether colorful slogans make people reach for highly processed food more often.

Material and methods. An anonymous proprietary questionnaire was used to conduct the study. The respondents were asked to answer questions related to the influence of advertisements on their consumer choices. 301 respondents took part in the survey.

Results. The respondents most often encountered food advertisements on the Internet. They mainly concerned sweets and fast food, which meant that 44% of respondents wanted a sweet snack, and 10% generally stimulated their appetite. Food advertisements, especially new and eye-catching ones, also influence children's eating habits.

Conclusion. Frequent viewing of advertisements for highly processed foods has an impact on consumers' dietary choices. In addition, they stimulate the appetite of the recipients of this type of advertising and encourage them to reach for sweet snacks.

Keywords. advertising, food choices, food in advertising

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The influence of alcohol on the central nervous system during puberty and in the prenatal period

Introduction. Alcohol is a highly toxic substance, especially for a young, developing organism. In the human body, the central nervous system (CNS) is the most exposed to the harmful effects of ethanol. Within the brain, the corpus callosum is an exceptionally sensitive structure, which binds both hemispheres of the brain together. Two types of cells can be distinguished in the CNS – neurons, which are the basic element of the nervous system of animals, and glial cells, which include: astrocytes, oligodendrocytes, microglia and ependymal glia. All of them play important roles in the CNS, responsible for such processes as the production of the blood-brain barrier, metabolic support of nerve cells and phagocytosis of apoptotic cells.

Aim. Influence of alcohol on CNS during puberty and in the prenatal period is described in this work.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. Under the influence of alcohol, numerous micro- and macroscopic changes occur, such as increased production of pro-inflammatory cytokines, changes in the distribution of GFAP in astrocytes or MBP in oligodendrocytes, as well as disorganization of the gray and white matter of the brain and expansion of the ventricular system. During adolescence, many changes in the functioning of the body take place, therefore the consumption of alcohol during this period should be kept to an absolute minimum. Disruption of the maturation process is associated with numerous developmental problems that become apparent in later adult life. Research has shown that there is no safe dose of alcohol for a maturing body. The effects alcohol has on the CNS in a young person are much stronger than that in an adult. By shrinking and damaging the blood vessel wall, ethanol leads to ischemia. It also induces a number of changes within the CNS cells and their organelles – in the mitochondria, the concentration of calcium increases, the activity of proteins in the respiratory chain is disturbed and the amount of free oxygen radicals increases. Ethanol strongly stimulates receptors located in the CNS, especially NDMA and GABA receptors, disrupting their proper functioning. Knowing about alcohol's mechanisms of action can explain many of the impulsive, reckless behaviors that are often seen in adolescents using the substance.

Remember that alcohol is also teratogenic. There is no safe dose of alcohol during pregnancy, the more so as it crosses the placenta and after 1-2 hours it reaches a concentration in the fetal blood similar to that in the mother's blood. Episodes of drinking alcohol in the third trimester of pregnancy are particularly dangerous because it is the period of synaptogenesis, the impairment of which may directly lead to apoptotic neurodegeneration and, in the future, to Fetal Alcohol Syndrome or Fetal Alcohol Effect. Studies have shown that the apoptotic response cannot be predicted from the dose, but depends on the rate of administration and how long the blood ethanol concentration is elevated. Compared to a properly developing brain, the one treated with ethanol is generally much lighter and less developed.

Conclusion. The influence of alcohol on the formation of the CNS is still poorly understood, therefore further research is needed, both on a scientific and clinical basis.

Keywords. adolescence, alcohol, brain, pregnancy, puberty, synaptogenesis

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Juice from birch and young pine shoots

Introduction. Juice from birch and young pine shoots is a slightly sweet, low-calorie, low-sugar beverage that's especially high in magnesium, manganese, and antioxidants.

Aim. Presentation of health-promoting properties of juice from birch and young pine shoots.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. Health-promoting properties of birch sap: Birch water, known as the elixir of life, comes from trees of the genus *Betula*. Birch sap is harvested in early spring. Although birch water only became popular in the United States, it has been used for centuries in Northern Europe and China for its potential health benefits. In winter, birch trees store nutrients, which are then released into the sap. Birch water is a clear, colorless liquid with a slightly sweet taste. After 2-3 days, it begins to ferment and takes on a more sour taste. Although research is limited, birch water can be beneficial to your health. Birch water contains many nutrients, especially vitamins and minerals. Historically, sailors even drank it to prevent scurvy. Many factors affect the nutrient content of birch water, including geography, soil type, and even the specific type and age of the tree. Even so, its calories and sugars are usually low, and nutrients like magnesium and manganese are high. The growing popularity of birch sap in Central Europe is accompanied by more and more frequent research on the chemical composition and impact on human health of this raw material obtained in the region. In the light of these studies, Central European birch sap can be considered a rich source of minerals, mainly copper, zinc and manganese. These minerals have a comprehensive impact, incl. on the human immune and reproductive systems as well as the condition of the skin, hair and nails.

Properties and use of syrup from young pine shoots: Needles contain a lot of vitamin C (many times more vitamin C in orange!), Which is essential for a healthy immune system. Needles contain resins and many different acids, as well as essential oils of terpenes, monoterpenes, and sesquiterpenes. Pine syrup is used as an expectorant which means it can help loosen mucus, expectorant and clear mucus. It is a cyclical stimulant, has antibacterial properties and has a mild diuretic effect. The syrup from young pine shoots has expectorant and antibacterial properties. It can be used not only temporarily, but also during infections and colds or throughout the year. Pine syrup stimulates the appetite, strengthens the body, has a calming, diuretic and diuretic effect on pine syrup. It is rich in antioxidants.

Conclusion. Both the juice from birch as well as young pine shoots are rich in health-promoting ingredients.

Keywords. application, birch, pine shoots

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Imaging diagnosis methods in breast cancer

Introduction. Nowadays, imaging diagnosis methods are becoming one of the basic methods of diagnosis in many diseases, mainly cancer.

Aim. The aim of this presentation is to analyze the percentage of breast cancer cases detected at an early stage, which will enable more effective treatment and reduce the risk of death due to breast cancer in the context of the applied diagnosis.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. The general term of breast imaging refers to breast sonography, mammography, and magnetic resonance tomography (MRT) of the breast (magnetic resonance mammography, MRM). Mammography uses low-dose amplitude-X-rays to examine the human breast. Cancerous masses and calcium deposits appear brighter on the mammogram. Ultrasound imaging is used to detect breast lesions and it is used as an adjunct tool for detecting the location of the suspicious lesion. The ultrasound transducer directs high-frequency sound waves into the breast tissues and detects the reflected sound waves. MRI uses the hydrogen nucleus for imaging purposes because this nucleus is abundant in water and fat. The magnetic property of the hydrogen nucleus is used to produce detailed images from any part of the body. The patient who is examined using MRI is placed in a magnetic field and a radio frequency wave is applied to create high contrast images of the breast.

Conclusion. Imaging is used to diagnose breast cancer and to evaluate the stage and extent of disease.

Keywords. breast cancer, mammography, magnetic resonance, ultrasound imaging

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Vitamin E

Introduction. Vitamin E is defined as eight congeners, four naturally occurring tocopherols and four analogous tocotrienols, depending on whether the side chain is saturated or contains three double bonds.

Aim. To present antioxidant properties of vitamin E as well as the effects of vitamin E deficiency.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. These compounds are composed of the 6-chromanol ring system with an attached isoprene side chain. In both groups, we distinguish 4 forms: α, β, γ and δ differing in the number of methyl substituents on the phenyl ring. In the human body, the most important role is played by α-tocopherol, being the most active, it accounts for about 85% of the total amount of vitamin E. Vitamin E is known as the main antioxidant found in the cells of the human body, the antioxidant properties of vitamin E are the result of the phenolic -OH group associated with the ring system. The antioxidant activity is based on the transfer of hydrogen from the hydroxyl group to the carbon atom of the superoxide radical by α-tocopherol. The reaction results in the formation of the tocopheroxyl radical. The condition of the antioxidant effect of vitamin E is the re-conversion of this radical into a non-radical form of vitamin, i.e. its regeneration, which is possible with the participation of reducing compounds such as glutathione, ascorbic acid and ubiquinone. Vitamin E deficiency leads to: changes in collagen metabolism, impairment of fibroblast function which leads to degradation of elastin and collagen, accumulation of lipofuscin in skin cells manifested by the appearance of "age spots", damage to brain cells due to oxidative stress, greater susceptibility of neurons and myelin sheaths neurons to the harmful effects of oxygen reactive, which leads to neuropathy and degenerative changes in the CNS. Vitamin E deficiency causes an increase in the cholesterol concentration in the tissues, which leads to the intensification of atherosclerotic changes in the arteries. The most important disorders occurring in the case of insufficient supply of vitamin E in the diet include anemia in infants and children as well as impaired functioning and weakening of skeletal muscles, i.e. dystrophy.

Conclusion. Vitamin E is key for strong immunity and healthy skin and eyes. In recent years, vitamin E supplements have become popular as antioxidants.

Keywords. α-tocopherol, antioxidant, deficiency

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Application of IR light in medicine

Introduction. Infrared light (IR) is a type of spectroscopy. Source of IR are saunas, heat lamps and sollux lamps. The wavelength varies from 0.8 μm to 1000 μm depending on the source. IR is widely used in medicine due to the pleiotropic effect on the tissues of the human body.

Aim. To show the health properties of the use of IR and its sources.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. There are three types of IR which differ depending on the wavelength. IR is divided into different bands: Near-Infrared (NIR, 0.78~3.0 μm), Mid-Infrared (MIR, 3.0~50.0 μm) and Far-Infrared (FIR, 50.0~1000.0 μm). The therapeutic effect is achieved through the influence of IR on the metabolic processes of tissues. IR stimulates thermoreceptors which are used in the treatment of cardiovascular diseases. Several studies have reported that IR can improve the healing of skin wounds, photoprevention, relieve pain, stiffness, fatigue of rheumatoid arthritis, ankylosing spondylitis, potentiate photodynamic therapy, treat ophthalmic, neurological, and psychiatric disorders, and stimulate the proliferation of mesenchymal and cardiac stem cells

Conclusion. The use of IR is widespread in the medical world, which allows the treatment of various diseases.

Keywords. IR, medicine, source

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The APGAR Scoring System

Introduction. Assessment according to the Apgar scale is based on checking the five main parameters indicating the condition of the newborn. They are: breathing, heart rate, skin color, muscle tension, physiological reflexes.

Aim. The aim was to discuss The APGAR Scoring System

Material and methods. The literature searches.

Analysis of the literature. The test´s purpose is to quickly determine the health of a newborn and whether or not a newborn requires immediate medical attention. The test in generally done 1 to 5 minutes after birth. The baby is given 0 to 2 points in each category depending on the reaction and measurement. The resulting score ranges from zero to 10. An overall score of 7 and above is considered normal, 4 to 6 fairly low, and 3 and below are regarded as critically low and cause for immediate resuscitative efforts. A score of 10 is uncommon, due to the prevalence of transient cyanosis, and does not substantially differ from a score of nine. A low score on the one minute mark requires medical attention but does not necessarily indicate a long-term problem. An APGAR score that remains low at the 10, 15 or 30 minute mark may indicate longer-term neurological damage. A low score on the scale is not good news, but – what is important – also these children, if properly treated and rehabilitated, have a good chance of proper development.

Conclusion. Various studies have shown that the Apgar score has variability between individual medical providers.

Keywords. APGAR, neurological damage, Scoring System

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Cancer

Introduction. Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body.

Aim. The aim of the poster was to present risk factors, treatment and prevention of cancer.

Material and methods. The literature searches.

Analysis of the literature. The analysis of literature was performed and provided answer for 3 main questions: (1) What can cause cancer (Smoking and Tobacco, Diet and Physical Activity, Exposure to cancer causing agents and Viruses and Other Infections). (2) How can we treat Cancer (Surgery, Chemotherapy, Radiation, Targeted Cancer Treatments, Antibodies, Cell Based Immunotherapy). (3) How to prevent Cancer? (Eating a healthy diet, exercising regularly, limiting alcohol, Maintaining a healthy weight)

Conclusion. We can prevent cancer by eating a healthy diet, exercising regularly, limiting alcohol, and maintaining a healthy weight.

Keywords cancer, healthy diet, limiting alcohol

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Cataract

Introduction. A cataract is clouding in the lens of the eye that can cause partial to temporary blindness.

Aim. To present information about cataract.

Material and methods. This work uses the scientific literature found in PubMed database.

Analysis of the literature. Although mostly common in older people, cataracts can affect younger adults due to environmental factors or injury to the eye. Babies can be born with congenital cataracts or develop them in childhood. In the course of senile cataracts, visual acuity is reduced, both near and far. Moreover, this defect cannot be corrected with glasses. Based on the degree of opacity, we can divide the senile cataract into the initial form (initial cataract), in which the opacification is just beginning, and the mature form (total cataract), the opacity covers the entire lens. The further stages of mature cataract development may turn into an overripe cataract, in which the lens is completely destroyed due to the spread of its mass and shrinkage. Cataracts may be partial or complete, stationary or progressive, or hard or soft. The main types of age-related cataracts are nuclear sclerosis, cortical, and posterior subcapsular.

Age cataract (early diagnosed) is treated with anti-cataracts, which are applied to the eyeballs in the form of drops. If the clouding covers the entire lens, surgery is required. After removing the cataract, it is necessary to use strong focusing glasses to replace the removed lens. You can also wear contact lenses. Increasingly, patients decide to insert a lens prosthesis. Poor vision caused by cataracts may also result in an increased risk of falling and depression. Cataracts cause half of all cases of blindness and 33% of visual impairment worldwide.

Conclusion. The cataract is one of surgery's oldest topics, and there are numerous references to cataract surgery in the literature.

Keywords. blindness, cataract, sufficient cataracts

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Chickenpox – one of the most childhood diseases

Introduction. Chickenpox is a common childhood disease and causes an itchy, blistering rash and is spread easily to others. Caused by varicella-zoster virus.

Aim. To present chickenpox.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Chickenpox is an infectious disease caused by varicella-zoster virus (VZV). Colloquially, chickenpox is called "windbreaker". The contagious agent of chickenpox is simply a person. Chickenpox occurs mainly in children in whom it is relatively mild. Moreover, it may appear in adolescents and adults, whose course is slightly more severe and causes a greater number of complications. The varicella virus VZV is transmitted by airborne droplets and air, even up to several dozen meters! This is why the condition is called chicken pox. The infection occurs when a child comes into contact with a sick person. It is also possible to transmit the disease in a direct way, i.e. contact with objects, clothes or towels in contact with the fluid exuded from the patient's skin blisters. Chickenpox infection occurs 1-2 days before the appearance of the first rash and vesicles, but we stop infecting others when scabs appear on the vesicles, which fall off spontaneously at the end. The incubation period of chickenpox (the time from the attack of the body by the virus to the first symptoms of chickenpox) is approximately 14-21 days. According to research, up to 95% of people are infected. of the entire population, and in our country each year about 200,000 patients see a doctor with symptoms of chickenpox. Chickenpox is caused by the VZV pathogen, which is transmitted by airborne or direct transmission, e.g. by using the same towel or utensils as the sick person. You can get infected in many ways, which is why a lot of wave infections are observed. When one of the children in kindergarten becomes ill, it is likely that more children will soon develop chickenpox.

Conclusion. Chickenpox is the most common and most common infectious disease in children.

Keywords. chickenpox, varicella-zoster virus

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Diabetes Type 1

Introduction. Type 1 diabetes usually appears in children and adolescents, sometimes also in early adulthood.

Aim. To present the most important information about type 1 diabetes.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. In those affected, the body's own antibodies destroy the insulin-producing beta cells in the pancreas. As soon as these autoantibodies have destroyed about 80 percent of the beta cells, type 1 diabetes becomes noticeable through greatly increased blood sugar levels: The destruction of the beta cells results in a lack of insulin. This hormone normally ensures that sugar (glucose) circulating in the blood reaches the body's cells, where it serves as a source of energy. Because of the lack of insulin, the sugar accumulates in the blood. Type 1 diabetes is a consequence of the autoimmune process, i.e. the spontaneous destruction of the body's cells. This process completely destroys the beta cells of the pancreatic islets that produce insulin. As a consequence, the pancreas loses its ability to produce insulin. Therefore, when treating type 1 diabetes mellitus, it is necessary to administer insulin by injection under the skin or by means of an insulin pump. Type 1 diabetes develops symptoms very early in life. The peak incidence is between the ages of 10 and 12, and then between the ages of 16 and 19, but the first symptoms may appear up to the age of 30. However, there is also a form of type 1 diabetes called LADA that does not appear until the age of 40-50 and even after the age of 70. However, type 1 diabetes is most often referred to in the context of adolescents, because at this age it occurs in by far the largest group of patients.

Conclusion. Diagnostics for diabetes is necessary at the very first symptoms, because neglecting disease symptoms or improper treatment can lead to serious health consequences and even death.

Keywords. diabetes, diagnostics, insulin

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Diabetes – symptoms, complications, treatment

Introduction. Type 1 diabetes is not an inherited disease, but patients with type 1 diabetes have a genetic predisposition to autoimmune diseases and this tendency to autoimmunity can be inherited.

Aim. To present diabetes – symptoms, complications, treatment.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. A person with type 1 diabetes may develop other diseases in this group, and people with other autoimmune diseases may develop type 1 diabetes. It is still unclear why some people with a genetic predisposition develop diabetes or other autoimmune diseases. It is believed that infections with certain viruses, which in a predisposed person initiate changes at the cellular level leading to disease, may play a role in initiating autoimmunity. The risk of developing type 1 diabetes in a sibling of a patient is 6%, and in a monozygotic twin it is 36%. The first symptoms of type 1 diabetes in children usually appear suddenly, sometimes with acidosis and keto coma as the first symptoms noticed. Typically, symptoms of type 1 diabetes develop within a few weeks (4-12). These include: increased thirst (drinking from a few to several liters of fluids a day), polyuria, weight loss, drowsiness, weakness, tendency to infections. The lack of insulin production by the pancreas leads to a significant increase in blood glucose and a metabolic disorder known as diabetic acidosis. The basis for the diagnosis of diabetes is increased blood glucose levels. The main drug used in the treatment of patients with type 1 diabetes is insulin. A patient with newly diagnosed diabetes requires treatment in a hospital setting. Initially, insulin is given as a continuous infusion into a vein using an external pump to deliver the drugs.

Conclusion. The goal of diabetes treatment is to avoid the occurrence of acute and chronic diabetes complications by keeping glucose levels within the recommended values for a given group of patients.

Keywords. diabetes, insulin, pancreas

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Doping in sport

Introduction. Doping fundamentally implies competitors taking unlawful substances to improve their exhibition.

Aim. The aim of this study was to discuss current situation in doping in sport.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. There are five kinds of restricted medications, called doping classes. The most widely recognized are energizers and chemicals. Endurance doping, in turn, is an artificial increase in the physical and mental capacity of a competitor with methods that go beyond normal, natural training. We can divide doping substances into several groups. The first are the so-called stimulants, e.g. ephedrine, amphetamines, cocaine or caffeine. These agents have a stimulating effect on the central and peripheral nervous system. Their action is short-lived, but when used in small amounts, they can contribute to an increase in blood pressure and increased heart rate, increased aggression, thermoregulation disorders, insomnia and lack of appetite, as well as mental disorders. The second group is narcotic painkillers such as morphine, methadone, dihydrocodeine, pethidine, pentazocine and others. They reduce pain of various origins, but very often lead to addiction and, consequently, to mental degradation, weakening of respiratory functions, lowering blood pressure, nausea and vomiting, and disturbance of concentration. Yet another group includes anabolic androgenic agents, i.e. synthetic derivatives of the natural male hormone testosterone, e.g. synthetic testosterone, nandrolone, vinsterol and others. These are synthetic agents similar to natural ones that significantly support the synthesis of proteins in muscle tissues, accelerating muscle growth and strength. They also often cause masculinization, and thus exaggeration of male features, even in women. The last group I discuss are peptide hormones, i.e. growth hormone, chorionic gonadotropin – HCG, or peptides GHRP 2-6, CJC 1295, BPC-157, melanotan. They can cause the overgrowth of organs inside the body as well as certain parts of the body. They can result in overgrowth and lesions of muscles and other tissues. When administered externally, they impair the production of natural hormones in the body.

Conclusion. According to the dictionary of the Polish language, doping means increasing your physical abilities by using illegal or permitted substances, but consumed in too much.

Keywords. doping, peptide hormones, sport

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Down syndrome

Introduction. Down syndrome is a syndrome of genetic defects also known as trisomy 21. It is the most common chromosomal disorder in humans.

Aim. To present a narrative overview of Down syndrome.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. People with Down's syndrome display distinctive features of appearance. The occurrence of defects such as heart defects, skeletal defects, digestive system defects or celiac disease is typical. Down syndrome occurs when all or a critical part of chromosome 21 is doubled. Such a rearrangement of the genetic material occurs most often as a result of an error in the separation of chromosomes during meiosis (non-disjunction). Unbalanced translocations involving chromosome 21 can also lead to Down's syndrome. Unbalanced translocations can only arise in the fetus due to the accidental joining of chromosome 21 with another chromosome. Unbalanced translocations may also be the result of inheriting a linked chromosome 21 from one of the parents, which is the carrier of a balanced translocation (mutual exchange of chromosome fragments without changing the amount of genetic material). What is the risk of having a baby with Down's syndrome if one parent has the disease? Inheriting a changed chromosome is a random event, because the reproductive cells of the translocation carrier may contain both normal and erroneous chromosomes. In this case, the risk of having a baby with Down syndrome occurs with every pregnancy, although it is never 100%. In this case, the probability of having a child with Down's syndrome, regardless of whether the mother or father is the carrier of the translocation, is close to 100%, which means that every child in this family will have Down's syndrome.

Conclusion. Down syndrome is diagnosed in the prenatal period.

Keywords. chromosomal disorder, Down syndrome, trisomy 21

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Erectile dysfunction

Introduction. Erectile dysfunction, or ED for short, is a disturbed or absent erection of the penis during sexual arousal.
Aim. To present information about erectile dysfunction and its risk factors.
Material and methods. In this study, publications published in the PubMed database were used.
Analysis of the literature. Risk factors for erectile dysfunction include: hypertension, diabetes mellitus, hyperlipidemia, nicotine abuse. penile dysfunction, or erectile dysfunction, is the inability to obtain and/or maintain the erection necessary for satisfactory sexual activity. Fortunately, this condition can be treated in many ways. The causes of penile erection problems include: Endocrine diseases – the human endocrine system is responsible for the production of hormones that regulate, among others, metabolism, sexual function, mood. The above may translate into a lack of genital response. Other complications caused by diabetes are disturbances in blood flow and hormone levels. Neurological factors – certain neurological problems can increase the risk of developing erectile dysfunction. Nervous states and stressful situations affect the reproductive system through the brain, which may make it impossible to achieve an erection. The neurological disorders that cause erectile dysfunction include Alzheimer's disease, Parkinson's disease, brain or spinal cord tumors, multiple sclerosis, stroke, paraplegia, and temporal epilepsy.
Conclusion. Diabetes is an example of hormone secretion disorders that can cause erection problems. It affects the proper use of insulin by the body, which may cause nerve damage as a side effect.
Keywords. erectile dysfunction, erection, risk factors

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Glasgow Coma Scale

Introduction. The Glasgow Coma Scale (GCS) is a clinical scale used to reliably measure a person's level of consciousness after a brain injury: used above the age of two and composed of three tests: EYE – VERBAL – MOTOR responses.
Aim. To present information about GCS.
Material and methods. In this study, publications published in the PubMed database were used.
Analysis of the literature. The GCS is a scale that allows you to measure a patient's level of consciousness and is used in medicine, especially in patients with head injury. It is used both in emergency medicine and to assess changes in the patient's level of consciousness during treatment. The GCS is reported as the combined score (which ranges from 3 to 15) and the score of each test. However, in some situations it is difficult to assess the patient's condition and place it on the Glasgow scale. This happens, for example, in the case of intubation, when the conscious patient does not tolerate the endotracheal tube and the GCS result is an indication for intubation, and paresis and paralysis when the patient is not moving. When the emergency team is confronted with a head injury patient, the loss of at least one Glasgow GCS point is an indication for a head CT scan. Lower GCS scores are correlated with higher risk of death. Glasgow Scale for Children: For children under 4 years of age, the Glasgow Pediatric Scale is used. Like the GCS for adults, the Pediatric Glasgow Scale has three items. Visual, verbal and motor responses are assessed.
Conclusion. However, the GCS score alone should not be used on its own to predict the outcome for an individual person with brain injury.
Keywords. brain injury, clinical score, test

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Heart diseases

Introduction. The work of the heart is a complex process that continues throughout a person's life. The heart muscle works like a pump that distributes blood to all cells in the body. Its contraction is triggered by an electrical impulse.

Aim. We indicate the most important elements of the heart structure and diseases that disrupt its work.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Heart diseases lead to disturbances in the functioning of the entire circulatory system. Their risk increases with age. They arise as a result of an overly fatty diet, obesity, excessive stress, smoking, lack of physical activity or genetic predisposition. Heart and circulatory system diseases are the greatest threats to life. In Poland, they are the main cause of death. These diseases usually result from hypoxia of the heart muscle cells, infection (viral or bacterial), as well as heart overload, damage, abnormal structure or loss of function.

Heart diseases include:

- blood vessel disease, such as coronary artery disease
- heart rhythm problems (arrhythmias)
- heart defects you're born with (congenital heart defects)
- heart valve disease
- disease of the heart muscle
- heart infection

Conclusion. Heart diseases are the leading cause of premature death and disability in humans and their incidence is on the rise globally.

Keywords. circulatory system, heart diseases, risk factors

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Hyperventilation syndrome

Introduction. Hyperventilation is controlled or autonomous increased ventilation of the lungs. It can represent a conditio where big amount of air enters the alveoli, reducing the partial pressure of carbon dioxide, leading to the development of respiratory alkalosis.

Aim. Presentation of hyperventilation syndrome.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. As hyperventilation often accompanies panic attacks, it can be a sign of nervous diseases, but also of diseases of the blood system and lungs. The most effective emergency response to hyperventilation is an injection of calcium bicarbonate, which increases the amount of carbon dioxide rapidly expelled from the body. This effect can be magnified by breathing into a paper bag. Hyperventilation can be one of the symptoms of chronic lung diseases, motion sickness, but also degenerative changes in the central nervous system. Chronic hyperventilation results from an abnormal lifestyle and is often associated with asthma, emphysema and lung cancer. Fainting may be a direct result of hyperventilation, so if its symptoms are diagnosed, it is worth using the above-mentioned solutions if possible. This disorder often accompanies, first of all, neurotic diseases, which means that, if ignored, it can even lead to a deterioration of the mental state. If neurosis is suspected, a psychiatrist should be consulted immediately. It also doesn't hurt to avoid stressful situations. Disturbance of the acid-base balance caused by hyperventilation often results in numbness of the face, hands, feet and oxygen deficiency in the brain. While a one-time hyperventilation does not pose a health risk, its regular occurrence is a sign that you need to see a specialist immediately, which will help you avoid possible consequences.

Conclusion. Hyperventilation can be a symptom of both physiological and neurological disorders, therefore, although it is not a disease itself, it is a condition which, if ignored, may have consequences.

Keywords. disorder, hyperventilation, lung disease

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Lung Cancer

Introduction. Lung cancer, also known as lung carcinoma, is the second most common cancer in both men and women.
Aim. The following article provides information on the symptoms, diagnosis, and detection of lung cancer.
Material and methods. In this review, publications published in the PubMed database were used.
Analysis of the literature. Lung cancer is the most common malignant tumor in humans. Each year, more than 22,000 new cases of lung cancer are diagnosed. According to the WHO classification, epithelial lung cancers are divided into two groups: non-small cell and small cell. The vast majority (more than 80%) of cases of lung cancer are due to long-term tobacco smoking. Symptoms of lung cancer in the early stages of the disease are usually non-specific, so lung cancer is most often diagnosed by accident on X-rays or computed tomography for completely different reasons. Possible symptoms and signs of lung cancer are also common to other types of disease, and may arise from less serious conditions. For this reason, the possible symptoms of cancer are often confused, ignored, or are tried to be alleviated by various measures such as antibiotics. A patient suspected of having lung cancer will first undergo a routine examination. A thorough medical history is an essential part of lung cancer detection and can help identify any symptoms that may be related to the disease. If there are disturbing symptoms that may indicate the development of lung cancer, it is necessary to undergo imaging tests to rule out the disease or assess its extent. The primary diagnostic tool for suspected lung cancer is a chest X-ray. Symptoms of lung cancer seen on a chest X-ray may vary depending on the location, size, or other changes (such as fibrosis) of the tumor. Computed tomography is also important in the assessment of tumor advancement. Positron emission tomography is increasingly used to accurately assess metastasis to lymph nodes and beyond the thorax in lung cancer. Lung cancer patients have basic blood tests and a general urine test to rule out other comorbidities. The levels of the CAE and CA 125 tumor markers should also be measured.
Conclusion. The search for new treatment options continues. Many clinical trials involving radiotherapy, surgery, microtubule inhibitors and immunotherapy are currently underway.
Keywords. cancer, epithelial lung cancer, X-ray

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Obesity

Introduction. Abnormal or excessive fat accumulation that presents a risk to health, with a body mass index (BMI) over 25 is overweight and over 30 is obese. Obesity is one of the most dangerous and complicated chronic diseases. It is caused by many factors, the so-called environmental (e.g. improper nutrition, low physical activity), psychological, genetic and hormonal.

Aim. The following article provides information on obesity.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Chronic disease of complex etiology, caused by low-intensity inflammation of adipose tissue, resulting in excessive development of the adipose tissue and an increase in body weight above the recommended level. Obesity is defined as a condition in which adipose tissue accounts for more than 25% of the total body weight in men and 30% in women. The more frequent occurrence of obesity in the developmental period in children is worrying, as it directly translates into a higher risk (up to 17.5 times) of obesity and related diseases in adulthood. The diagnosis of obesity at the age of 6 means a 25% risk of obesity in adulthood, Obesity at the age of 12 is already 75% of the risk. Obesity was considered a disease more than 50 years ago. The World Health Organization entered it on the International List of Diseases and Health Problems (the so-called ICD10 classification) under the code E66. In Poland, this list has been in force since 1996 and every doctor has it in his desk. When making a diagnosis for a patient, he must enter the appropriate disease code on the card.

There are many causes of obesity and they are varied. Each patient may have several or even a dozen or so. Determining the factor(s) causing obesity is a long process and requires individual diagnostics for each patient, and subsequent effective treatment of personalized methods and tools.

Conclusion. Moreover, obesity research continues to reveal new causes that could lead to the emergence of this disease.

Keywords. adipose tissue, BMI, obesity

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Rosacea

Introduction. Rosacea is a chronic skin disease with periods of remissions and exacerbation. Affect 1-10% of the population. It usually starts as a redness in the center of face, which may be paroxysmal erythema e.g. after workout.

Aim. The following article provides information on rosacea.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Rosacea only affects adults. Most cases are diagnosed in women around the age of 40. Men get sick less often, but the course of the disease is much more severe. People with fair complexion, with light eyes and hair color, the so-called I and II skin phototype. Rosacea is a chronic, inflammatory disease that affects the skin of the face around the forehead, nose, cheeks, and chin. The disease occurs only in adults, but its first harbingers may appear already in adolescence. The causes of rosacea are not fully understood. It is known that its appearance is influenced by several factors: genetic predisposition, malfunction of the immune system, vasomotor disorders (increased reactivity of the blood vessels in the skin of the face), endocrine disorders. Often the causes of rosacea are also environmental factors - prolonged stress, incorrect diet, alcohol consumption, taking certain medications, mainly ointments containing glucocorticosteroids, and incorrect care. Rosacea can also cause problems in the functioning of the digestive system. A link has been found between the disease and *Helicobacter pylori* infection, gastritis, and ischemia (a condition where the pH of gastric juice drops). The onset of rosacea is manifested by reddening of the central part of the face (forehead, nose, cheeks and chin), accompanied by skin tightness, moderate itching, stinging, burning and a local temperature increase. The so-called telangiectasias, i.e. dilated small blood vessels. Symptoms of rosacea appear under the influence of sunlight, high temperature, chlorine water and certain meals (fatty, hard to digest, spicy). Initially, they last for several minutes, but each time they last longer and longer and gradually become permanent. Symptoms of rosacea in the next stage of the disease are papules, pustules and swelling of the face that appear at the site of earlier redness. The complexion also changes. It becomes dry, rough and oversensitive. In some patients, bumps develop on the forehead or nose, which lead to facial deformation.

Conclusion. Most people with rosacea have only mild redness and are never formally diagnosed or treated. No test for rosacea is known.

Keywords. inflammatory disease, rosacea, skin

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Stroke: your journey to recovery

Introduction. A stroke happens when blood stops flowing to any part of your brain. This may cause damage. The effects of your stroke depend on the location and amount of injury that happened to the brain.

Aim. The following article provides information on stroke.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. A stroke is a serious life-threatening medical condition that happens when the blood supply to part of the brain is cut off. A stroke occurs when the brain's supply of oxygen-rich blood is blocked or when there is sudden bleeding in the brain.

Conclusion. Ischemic stroke is characterized by the sudden loss of blood circulation to an area of the brain.

Keywords. brain, stroke, recovery

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Stroke

Introduction. A stroke occurs when the blood supply to part of your brain is interrupted or reduced, preventing brain tissue from getting oxygen and nutrients. Brain cells begin to die in minutes.

Aim. The following article provides information on stroke.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. There are two main types of stroke: ischemic, due to lack of blood flow, and hemorrhagic, due to bleeding. Stroke most often affects people over 65 (this does not mean, however, that only elderly people are at risk of this disease!). Our society is an aging society – so necessarily this problem affects a constantly growing group of people. Young people are also increasingly affected by stroke. It is undoubtedly a health and life threatening condition, and the most important factor is time again. Ischemic stroke accounts for 4/5 of all cases. It occurs when an artery that supplies the brain with blood is blocked. As a consequence, blood cannot flow through it, or it does not flow enough for cells in the brain to receive enough blood. Atherosclerosis is considered the most common cause of ischemic stroke. The mechanism of this disease causes the so-called arteries to form. Atherosclerotic plaques are obstacles that block blood flow and build up in the walls of blood vessels, consisting mainly of cholesterol. As the disease progresses, plaques gradually increase, and the lumen of the artery becomes narrower and narrower. Eventually, they are completely blocked – usually by a blood clot forming in such a restriction – to stop blood flow. Signs and symptoms of a stroke may include an inability to move or feel on one side of the body, problems understanding or speaking, dizziness, or loss of vision to one side. The main risk factor for stroke is high blood pressure. Additionally, other risk factors include smoking, obesity, high blood cholesterol, diabetes, and end-stage kidney disease.

Conclusion. Given the disease burden of strokes, prevention is an important public health concern.

Keywords. blood, brain, stroke,

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Stroke

Introduction. An ischemic stroke occurs when an artery that supplies blood to one part of the brain becomes obstructed, i.e. there is no flow or the amount of blood flowing through it is insufficient to nourish the brain. A hemorrhagic stroke, commonly known as a stroke, occurs when a cerebral artery ruptures.

Aim. The following article provides information on stroke.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. As a result of the rupture, the blood flows outside the artery, which destroys the surrounding nerve tissue and causes an increase in pressure inside the skull, disrupting the functioning of the entire brain. The most common cause of a stroke is a cerebral embolism, which is a blockage of blood flow in a vessel by a clot formed in the heart, which, along with the blood, goes to the brain vessels. This thrombus may arise, inter alia, during atrial fibrillation, on the surface of malfunctioning heart valves and in the course of myocardial infarction.

- occurs when: a blood vessel ruptures and bleeds or there is a blockade of a blood supply
- oxygenated blood cannot travel to the brain tissue
- three main types: transient ischemic attack, ischemic stroke and hemorrhagic stroke

The method of treatment depends on whether the stroke is the result of a blood clot or bleeding. Currently, embolization is used more often (during embolization, a catheter is inserted into the damaged vessel/aneurysm through which special adhesives, gelatin sponges, special spirals or balloons closing the damaged vessel are applied) than craniotomy (removal of a fragment of the skull bone to allow surgical access to the damaged vessels) as they are associated with a lower risk of permanent disability.

Conclusion. Quickly implemented and effective stroke treatments can prevent long-term disability and save lives.

Keywords. hemorrhagic stroke, ischemic stroke, vessel

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Vitamin-D deficiency

Introduction. Vitamin D is often called the "elixir of life" – it is one of the key substances that condition human health and proper development. Several forms of vitamin D exist. The two major forms are: vitamin D_2 (ergocalciferol) found in plant organisms and fungi, and vitamin D_3 (cholecalciferol) found in animals, which is formed as a result of skin synthesis under the influence of solar UVB radiation (wavelength 290-315 nm).

Aim. The following article provides information on deficiency of vitamin D.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. For humans, the most important source of vitamin D is sunlight – it is produced in our bodies as a result of certain transformations of cholesterol that occur under the influence of sunlight. Hence, vitamin D is also called the "sun" vitamin. Vitamin D performs the following tasks in our body: maintains the proper level of calcium in the blood by increasing the intestinal absorption of calcium and phosphorus and inhibiting their excessive excretion, it is necessary for the optimal formation of the skeletal system, has a positive effect on the nervous system and the work of the muscular system, supports the functioning of the immune system, and reduces skin inflammation. Deficiency results in impaired bone mineralization and bone damage which leads to bone-softening diseases, including rickets in children and osteomalacia in adults.

Conclusion. Vitamin D deficiency is found worldwide in the elderly and remains common in children and adults.

Keywords. cholecalciferol, deficiency, ergocalciferol, vitamin D

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Common nettle (*Urtica Dioica*) as a source of vitamin B5 – the role and its application in medicine

Introduction. Common nettle (*Urtica dioica*) occurs in the wild in Europe, Asia, North Africa and North America. It has adapted to development in other areas of the world through human activity and is therefore also called a synanthrope. It grows in thickets and wet forests.

Aim. The following article provides information on common nettle.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Nettle is a nitrophilic plant, that is, it prefers soils rich in nitrogen, and therefore, as a so-called ruderal plant, it is often found close to human settlements. Hippocrates already knew about the healing properties of nettle in ancient times when he used it to heal wounds and stop bleeding, and later to St. Hildegard, Paracelsus and Metthiolus. In the nineteenth century, it was forgotten and was considered only food for the poor. Currently, thanks to the progress of science, the benefits of using nettle in diseases such as arthritis, allergy, diabetes and benign prostatic hyperplasia have been confirmed. Nevertheless, the new uses of nettle in the area of disease prevention and treatment are still being analyzed. Vitamin B5 deficiencies are extremely rare because pantothenic acid is a common ingredient in the foods we eat. Sometimes vitamin B5 avitaminosis can appear in people who overuse sugar and sweets and eat certain food products, such as: French fries, pizza, white bread and wheat pasta. Vitamin B5 deficiency may be manifested by: fatigue and weakness, weight loss, burning sensation in the feet, dizziness and pain in the head and abdomen, gastrointestinal motility disorders, limb muscle cramps, and visual impairment.

Conclusion. Vitamin B5 deficiency may be manifested by: fatigue and weakness, weight loss, burning sensation in the feet, dizziness and pain in the head and abdomen, gastrointestinal motility disorders, limb muscle cramps, and visual impairment.

Keywords. nettle, Urtica dioica, vitamin B5

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Ephedrine

Introduction. Ephedrine is an organic compound belonging to the group of plant alkaloids, found mainly in shrubs of the species of spinal cord, namely *Ephedra sinica, Ephedra equisentina, Ephedra intermedia*.

Aim. The following article provides information on ephedrine.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. It is a stimulant of the sympathetic nervous system, which influences the increased release of noradrenaline from nerve cells and binds and stimulates alpha-1-, beta-1- and beta-2-adrenergic receptors. Due to the fact that it increases the cardiac output, it causes the heart rate to increase. Ephedrine promotes the reduction of fat accumulated in the body in several ways. First, it does so by promoting the increased use of fatty acids as a source for energy production. Secondly, it increases the metabolic rate in the body. Thirdly, it has an effect on muscle cells, in which it also enhances energy expenditure. Fourth, it affects brown adipose tissue responsible for thermogenesis through beta-adrenergic receptors. Fifth, it leads to increased oxygen consumption. Sixth, it can slow down gastric emptying, which translates into gradual and prolonged absorption of nutrients, and thus delayed the appearance of hunger. Many studies emphasize that much more measurable benefits are obtained when using the combination of ephedrine with caffeine, because summing up their actions results in a synergy effect. The active component of *Ephedra* shows a stronger effect when used with a reduced caloric intake than in calorie-rich diets. Digitalis is currently used mainly in heart failure, atrial fibrillation, and angina. Recent studies of digitalis glycosides confirm their hormonal and regulatory functions, which justifies their treatment as lead compounds for new drugs in other therapeutic areas – especially in oncology. Lily of the valley herb contains cardenolide glycosides, derivatives of strophantidin, strophantidol and perplogenin, hence they are included in the group of cardenolide raw materials. The most important glycoside of the lily of the valley herb is convalatoxin, which is formed from convaloside during the drying of the raw material. It is a potent cardiac activity that is used in an isolated state. The second important glycoside is convvalatoxol. The raw material also contains steroid saponins and flavonoids.

Conclusion. Ephedrine is a medication and stimulant. It is often used to prevent low blood pressure during spinal anesthesia.

Keywords. alkaloid, ephedrine, plant

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Cardiac glycosides of lily of the valley and digitalis

Introduction. In the treatment of heart failure, substances having a positive inotropic effect and thus increasing the strength of heart muscle contraction, such as cardiac glycosides, are used.

Aim. To present cardiac glycosides of lily of the valley and digitalis.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Cardiac glycosides are combinations of steroidal aglycones with various sugars. Aglycones are non-sugar components of glycosides linked to sugar by a glycosidic bond. They have a steroid structure with a lactone ring at the C-17 carbon. The aglycones can be, for example, alcohols, carboxylic acids, phenols. Cardiac glycosides have a positive inotropic effect – they increase the contraction of the heart muscle and positive bathmotropic activity. Cardiac glycosides act directly and indirectly on cardiac and vascular function, affecting the sympathetic and parasympathetic nervous systems. They affect the parasympathetic system by activating it. Increasing the vagal nerve tension inhibits the function of the sinoatrial and atrioventricular nodes and slows down their rhythm. Cardiac glycosides reduce sympathetic tone, reducing the resistance of peripheral arterioles. As a result of their action, the heart works more economically and blood pressure is lowered. A contraindication to the use of cardiac glycosides is a recent myocardial infarction.

Conclusion. Lily of the valley and digitalis extracts are a component of many herbal preparations used as a tonic for the heart.

Keywords. digitalis, glycoside, heart failure, lily of the valley

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Cardiac glycosides in the lily of the valley (*Convallaria majalis*)

Introduction. Cardiac glycosides are plant substances that have a strong effect on the human body.

Aim. To present cardiac glycosides of lily of the valley.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Their most important action is to slow down the heart rate, as well as increase the strength of the heart muscle, which improves the strength and efficiency of the heart. This is the main reason for using them in the past as basic measures for heart failure diseases. The use of cardiac glycosides, however, carries the risk of developing life-threatening side effects. Current research shows that the benefits resulting from their use in treatment are not necessarily or not significantly greater compared to the newer, safer groups of drugs. This means that at present this group of plant active substances has much less application in medicine. They are used, but mainly as a combination of treatment with other drugs in the later stages of heart failure.

Lily of the valley (*Convallaria majalis*), also known as the forest or fragrant lily of the valley. It is a species of the *Asparagaceae* Juss family. A perennial with a crawling rhizome, at the ends of which flower shoots grow, covered with large leaves. Flower shoots, on the other hand, have clusters of fragrant white flowers at their ends. The fruits of the lily of the valley begin to ripen at the end of August – red berries. Of the cardenolide glycosides of the lily of the valley, the most important is convalatoxin – it is formed during the drying of the raw material from convaleside. The second important glycoside is convvalatoxol. The other ingredients are of minor pharmacological importance.

Conclusion. Lily of the valley is one of the medicinal plants long known to contain cardioactive glycosides.

Keywords. cardiac glycosides, heart, lily of the valley

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Dermatological manifestations in COVID-19

Introduction. Initially it seemed that COVID-19 manifested itself mainly by respiratory symptoms, it is now known that it is a multi-organ disease, with symptoms also extending to the skin. Skin symptoms in COVID-19 patients show a wide clinical spectrum and may appear at any stage of the disease, as well as be its only manifestation.

Aim. The paper summarizes the current state of knowledge on changes in the skin, mucous membranes and nail apparatus observed in patients diagnosed with the disease, as well as lists possible skin side effects of drugs most often used in this group of patients.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. The exact incidence of skin lesions in COVID-19 is not known – the percentage was less than 1% in observations from Wuhan, and even about 20% in those hospitalized at Lecco Hospital, Lombardy. The reasons for such large differences have not yet been explained. Various hypotheses are discussed, such as the involvement of dermatologists in triad and caring for patients with COVID-19, genetic differences in the studied populations, as well as the percentage of patients in intensive care units undergoing repeated and detailed clinical evaluation.

Conclusion. Further research is necessary to clarify the pathogenesis of these changes, their prognostic significance and to determine the therapeutic procedure.

Keywords. COVID-19, SARS-CoV-2, skin

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Reserpine

Introduction. Reserpine is an alkaloid of natural origin, isolated from the roots of the snake rauwolfia (*Rauwolfia serpentina*) growing at the foot of the Himalayas, and has been used in medicine for centuries. Chemically, it is an indole derivative, classified as the indole alkaloids of the yohimbane type. It is an ester of trimethoxybenzoic acid.

Aim. To present reserpine.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Reserpine is easily absorbed from the gastrointestinal tract and penetrates easily into the central nervous system. It works slowly and can accumulate in the body, accumulating mainly in lipid-rich tissues. The mechanism of action of reserpine is to flush catecholamines (neurotransmitters – especially from the so-called deep stores) and prevent their accumulation in the nerve endings of the sympathetic nervous system. This stops these transmitters from working in the brain and peripheral nerves. By canceling the transmission in the sympathetic nervous system, the blood vessels widen, thus lowering blood pressure. Reserpine also has a calming effect. It is used to treat mild hypertension associated with sinus tachycardia, mainly as a component of combined preparations. In the past, reserpine was used as an antipsychotic, incl. in the treatment of schizophrenia (higher doses - up to 4 mg and even 15 mg/day). However, it is hardly used in psychiatry today. Side effects include: drowsiness, depressive effects, fatigue, decreased reaction speed (which may affect the ability to drive and use machines), aggravation of peptic ulcer disease, vomiting, diarrhea, potency disorders.

Conclusion. Due to side effects and the introduction of more effective drugs, reserpine is used less and less, and in some countries withdrawn from drug registrations. Only one preparation containing reserpine remains in Poland.

Keywords. indole alkaloid, medicinal plant, reserpine

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Neurofeedback as a modern and effective method used in sports training

Introduction. Neurofeedback is a modern method of therapy that allows you to observe and influence the bioelectrical activity of the brain in order to optimize its functioning.
Aim. To present neurofeedback as a modern and effective methods used in sports training.
Material and methods. In this review, publications published in the PubMed database were used.
Analysis of the literature. The trainee works on changing the frequency of his brain waves, presented in the form of a video game. The sound of the point rewards the brain for the correct performance of the task, i.e. achieving the appropriate level of attention, involvement in the activity performed and relaxation during the game. In this way, the athlete's state of mind influences the outcome of the game. Monitoring the frequency of waves through electrodes placed on the scalp allows you to see if the exerciser really achieves the state of maximum concentration, whether the muscles are not nervously tense during training and can actively focus on the task at hand. Neurofeedback training is a method often used in sports. It works great wherever shorter reaction time and precision of movements are important. An athlete requires increased concentration and the ability to switch between different states of mind. Training strengthens the automatism of movements, gives greater control of the actions performed, and improves the ability to analyze and predict one's own and opponent's movements.
Conclusion. The method is used by runners, footballers, sport shooters, basketball players, ski jumpers, snowboarders and others. The method is popular both in Poland and around the world.
Keywords. brain waves, neurofeedback, sport training

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Hereditary nonpolyposis colorectal cancer

Introduction. One of the leading causes of cancer-related deaths is colorectal cancer, which ranks second among men and third among women.

Aim. To present colorectal cancer**.**

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Every year, approximately 10,000 people in Poland are diagnosed with carcinoma coli et recti (colorectal cancer), of which 10-20% of cases are hereditary. Hereditary colorectal cancer unrelated to polyposis accounts for approximately 7-8% of all colorectal cancers. The clinical picture of the disease is distinguished by an early age of onset (before 50 years of age), usually the right-sided location of tumors, in 2/3 of cases the location of tumors in the distal part, vertical disease transfer, microsatellite instability (MSI) in over 90% of people, more than 2 cases of colorectal cancer among relatives and an increased incidence of gallbladder and endometrial cancer. Mutations of MLH1 and MSH2 genes occurring in 40-85% of cases are dominant among HNPCC families. Sequence changes are less frequent in the PMS1 and PMS2 genes and are present in 20% of patients. Gene mutations mainly involve deletions of single nucleotides, resulting in a shift in the reading frame or larger fragments of microsatellite DNA, which leads to its shortening. Colorectal cancer arises from the epithelium that lines the colon and rectum. In young, genetically burdened people, around 20 years of age, hundreds or thousands of polyps develop on the surface of the lumen of the intestine. Pre-cancerous changes become malignant at the age of about 40. Familial adenomatous polyposis of the colon can also develop in the first decade of life, and the disease takes its toll among the few years old. In the initial phase, FAP develops asymptomatically, then there is blood in the stool, diarrhea, and with the development of the disease, painful abdominal cramps, weight loss, and weakness. Parenteral symptoms are observed in mutation carriers, including bone changes (dental cysts), extra teeth, skin changes (fibromatosis), congenital hyperplasia of the retinal pigment epithelium, gastric and duodenal polyps.

Conclusion. Most colorectal cancers are due to old age and lifestyle factors, with only a small number of cases due to underlying genetic disorders.

Keywords. cancer-related death, colorectal cancer, polyposis

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TAXOL – the drug of the future

Introduction. Taxol belongs to the phase-specific drugs (G2 phase and M phase). Its antimitotic effect is based on the inhibition of microtubule depolymerization, which prevents the proper separation of sister chromatids and the migration of sister chromosomes during cell division. Cell death is the consequence of disturbed mitosis.

Aim. To present Taxol and its application in medicine.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Taxol is obtained from the fruit of the Western yew (*Taxus brevifolia*), as well as other plants of the genus *Taxus*. The healing properties of taxol have been known for centuries. The current research focuses on understanding the mechanisms of the anti-cancer action of this drug. Previous studies have shown that taxol participates in the regulation of the cell cycle. When administered in small amounts, it immobilizes the spindle microtubules during mitosis, blocking cell proliferation and inducing apoptosis, also by regulating the activity of anti- and pro-apoptotic proteins. Taxol belongs to chemotherapy medication used to treat a number of types of cancer. This includes ovarian cancer, esophageal cancer, breast cancer, lung cancer, cervical cancer, and pancreatic cancer.

Conclusion. Taxol is a cancer chemotherapy drug that works by slowing or stopping cancer cell growth.

Keywords. apoptosis, cell cycle, microtubule depolymerization, taxol

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The influence of alcohol on the central nervous system

Introduction. Ethyl alcohol has been considered a universal remedy for thousands of years – both in ancient times, when low-percentage alcoholic beverages were obtained from the fermentation of grapes and grains, and in the Middle Ages, in which, thanks to the improvement of the distillation technique, it was learned to obtain beverages with a higher percentage of alcohol.

Aim. To present the influence of ethyl alcohol in the central nervous system.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. One of the systems exposed to the toxic effect of ethyl alcohol is the brain as the main part of the central nervous system and the nerve trunks and roots as the peripheral nervous system. Destruction of cells and tissues occurs not only in addicts but also in non-addicts who occasionally or periodically abuse alcohol. Alcohol acts on the nervous system as a protoplasmic poison inducing, inter alia, suicidal death of its cells through a biological disruption of important biochemical activities. Damage to the structure of the nervous system and disturbance of metabolic and biochemical processes lead to an addictive disease, which is not only a medical problem, but also a social one, and its treatment requires, above all, psychological support. Particularly important for the problem of addiction is the targeted arousal system, which provides cortical responses with emotional qualities, such as fear, anger, pleasure or disgust. The serotonergic, noradrenergic, opioid and peptide systems play an important role in the addiction process.

Conclusion. Currently, it is believed that the therapeutic effect of alcohol is limited and that its habitual consumption is devastating its biological, social and cultural effects.

Keywords. brain, central nervous system, ethyl alcohol

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Scoliosis made straight

Introduction. Scoliosis is a medical condition concerning vertebral column, in simple words it is curvature of a spine. Scoliosis is quite complex and so far in many dimensions mysterious matter. Over the years, scoliosis overgrown with a lot of myths, hopefully it's getting more attention nowadays.

Aim. To present scoliosis.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Scoliosis of the spine is a lateral curvature of the spine, which is a three-dimensional deformation of the spine consisting in lateral bending in the frontal plane, deviation in the sagittal plane and segmental axial rotation. Treatment of scoliosis involves systematic rehabilitation and wearing a special corset, the most important thing is that it always takes place under the supervision of a doctor. Scoliosis is a three-dimensional deformity of the spine and torso that affects millions of people around the world. While 20% of scoliosis cases can be attributed to neuromuscular, syndromal or congenital disorders, as much as 80% of all scoliosis are described as "idiopathic" or of unknown etiology days. The patient's spine takes the form of the letter S. Scoliosis usually affects the thoracic spine or the area between the thoracic and lumbar spine (rarely the lumbar spine itself). The most common causes of scoliosis are incorrect sitting posture and lack of physical activity. Children who develop the disease most often suffer from the disease.

Conclusion. Scoliosis should not be ignored, as if left untreated it can lead to various complications.

Keywords. scoliosis, spine, vertebral column

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Limonen

Introduction. Limonen an organic chemical compound from the group of monoterpenes, contains one chiral center and thus exists in the form of two enantiomers. It is responsible for the smell of lemons, it is mainly found in its peel.

Aim. To present limonen and its application in medicine.

Material and methods. In this study, publications published in the PubMed database were used.

Analysis of the literature. Limonene is taken from the environment mainly through the food you eat, as it occurs naturally in citrus fruits and is widely used as a flavoring and aromatic agent in food technology. Limonene is also delivered to the human body as a result of inhalation of air in which limonene is in the form of an aerosol. According to various sources, the indoor limonene concentration ranges from 1.6 to 480 μg/m^3. It was observed that the limonene level was higher in winter, which was explained by the lower ventilation of the rooms. The general level of limonene inhalation from the external environment as well as from closed rooms ranges from 10 to 0.1 μg/kg body weight/day. The exposure of the skin to limonene occurs mainly through cleaning agents and air fresheners. Data on the limonene content in drinking water and beverages are less significant due to the low solubility of limonene in water. The adsorption of D-limonene through the skin is probably much lower compared to the inhalation adsorption. Alternative practitioners have long touted the benefits of limonene, claiming that it not only burns fat but reduces inflammation and kills disease-causing germs. Moreover, There is some evidence that limonene can promote weight loss by lowering blood sugar and lipids associated with metabolic syndrome.

Conclusion. These findings suggest that limonene may be helpful in preventing or treating metabolic syndrome, although further research is needed to confirm such a benefit and determine the dose needed to be effective in humans.

Keywords. limonen, medicine, monoterpene

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Common thyme (*Thymus vulgaris* l.)

Introduction. Thyme has been known in Poland for centuries, initially imported, then cultivated and valued for its culinary and medicinal qualities. Currently, it is a plant commonly found in Poland. It is most often used in the kitchen, but it should be remembered that it is included in many medicinal preparations. Found in cosmetics, used in aromatherapy as well as flower and plant compositions.

Aim. The aim of the study was to present thyme and its application in medicine.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. Due to the abundance of antimicrobial and antioxidant compounds, thyme was used in respiratory diseases, having anti-inflammatory and expectorant properties. Supports the functioning of the digestive system (with stomach, intestinal and liver problems). The intense scent of thyme is used in aromatherapy, as well as in many cosmetics such as pastes, creams, lotions and bath salts. Summary. Due to its valuable qualities, thyme is more and more often perceived as an ingredient not only giving fragrance, but also having a beneficial effect on the product.

Conclusion. Its wide spectrum of properties is increasingly used in natural preparations and modern food and cosmetic products.

Keywords. thyme, medicinal properties, application

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Procedure of genetic diagnostics of patients with suspected hereditary tumor position syndrome using the example of HNPCC/Lynch Syndrome

Introduction. Cancer cases among women concerns breast (22.8%), lung (9.5%) and colorectal cancer (9.0%). Cancer cases among men: prostate cancer (19.3%), lung cancer (17.5%) and colorectal cancer (11.5%). Hereditary nonpolyposis colorectal cancer (HNPCC or Lynch syndrome) is a genetic disease of autosomal dominant inheritance. HNPCC/Lynch syndrome usually involves only single colorectal adenomas or carcinomas that cannot be clinically distinguished from sporadic tumors.

Aim. The aim of the study was to present procedure of genetic diagnostics of patients with suspected hereditary tumor position syndrome using the example of HNPCC/Lynch Syndrome.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. There are multiple applications of molecular tests in clinical oncology. Mutation analysis is now routinely utilized for the diagnosis of hereditary cancer syndromes. Lynch syndrome should be monitored with annual colonoscopy.

Conclusion. HNPCC/Lynch Syndrome is caused by a mutation in one of four genes of the DNA mismatch repair. system

Keywords. colon cancer, HNPCC, Lynch Syndrome

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EVALI – a new disease entity associated with electronic cigarettes

Introduction. Electronic cigarettes are devices that dispense nicotine by inhalation. They are promoted as less harmful and as a smoking cessation aid.

Aim. The aim of the study was to present EVALI (E-cigarette Vaping Associated Lung Injury).

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. Vitamin-E acetate as a component of liquid may interfere with the physiological functions of the lungs by interacting with phospholipids and epithelial lining surfactants during inhalation. In a few cases it has been found in bronchoalveolar lavage fluids. Electronic cigarettes cause EVALI disease. At the moment, the exact pathophysiology of lung injury in this mechanism is unclear. The diagnosis of EVALI is made in most cases in young adults and adolescents who have vaporized up to 90 days after the onset of symptoms.

Conclusion. EVALI is acute lung injury associated with the inhalation of chemicals that arise from the use of e-cigarettes.

Keywords. electronic cigarettes, lung disease, smoking

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Brachytherapy in the treatment of lung cancer – treatment planning

Introduction. In the situation of the COVID-19 epidemic, special attention is paid to lesions affecting the lungs.
Aim. In our work, however, we wanted to focus on neoplastic changes in this organ, and more specifically, we would like to focus on the method of treating these pathologies, which is brachytherapy. The aim of our work is to present the method of treatment planning using this technique in the Brachytherapy Department in Brzozów in the Podkarpacie region.
Material and methods. To date, many studies have been conducted in the field of brachytherapy. The context of palliative treatment of cancer patients with HDR brachytherapy has emerged and the topic of modern treatment planning methods.
Results. By delving into the research conducted at the facility in Brzozów, we could learn how the brachytherapy treatment is carried out there. In order to better understand the mechanism of brachytherapy, we decided to delve into the course of treatment planning, starting with the imaging of the examined area using computed tomography, and ending with removing the applicators from the patient's body. The method of treatment itself is radical, but it also has its advantages in the form of concentrating the dose in the pathologically changed tissue. It gives high hopes for curing the patient of the disease, but the successes achieved are an individual matter. In some cases, this method is completely successful, while in others additional treatment is required. Our observations show that brachytherapy is a very promising method of lung cancer treatment. The brachytherapy device itself is not complicated to use and offers great opportunities for the doctor performing the procedure. Nevertheless, he must know whether the dose distribution obtained by means of computerized treatment planning is suitably optimized. That is why the experience of the person conducting the test is so important.
Conclusion. We believe that further research in this field will help to bring closer the problems related to this procedure, and thus help improve the process of preparing and carrying out brachytherapy.
Keywords. brachytherapy, lung cancer, treatment

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Brachytherapy and the treatment of lung cancer

Introduction. HDR brachytherapy is a proven and safe method that allows radiotherapists to treat lung cancer with high precision and in a less burdensome way for patients.

Aim. The aim of the study was to present application of brachytherapy in the treatment of lung cancer.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. On the one hand, it enables the administration of a higher than standard dose to the tumor occluding the bronchial lumen, on the other hand, due to the technique used, it better protects the healthy tissues surrounding the lung tumor. This makes the treatment course much shorter and less strenuous than other cancer treatments. HDR brachytherapy can be used as a standalone treatment or as a combined treatment method (with conformal radiotherapy). The choice of procedure depends on the stage of the disease and the joint decision of the doctor and the patient. It can be used as an independent radical treatment in selected tumors in the early stages of development or as a radical treatment combined with teleradiotherapy (radiation from external fields) in the case of more advanced tumors. It is also often indicated as an adjuvant therapy after surgery to kill cancer cells that may have remained in the operated field.

Conclusion. Brachytherapy is mainly used in the treatment of the primary tumor.

Keywords. HDR brachytherapy, lung cancer, treatment

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Medicinal viviparous – application in medicine

Introduction. A viviparous plant is that plant where the seeds that are produced by the plant start germinating while on the parent's body.

Aim. To present application of viviparous plant in medicine.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. Viviparous plant is a source of vitamin C. It helps in the treatment of respiratory diseases, soothes rheumatic pains and heals acne. The viviparous plant can be used as a medicinal plant, but also as an ornamental plant. In our country, it is gaining more and more popularity due to its numerous healing properties. Viviparous is a plant that has many different properties, including anti-inflammatory, regenerating, immunostimulating, as well as fungus and bactericidal properties.

Viviparous juice has high healing properties which is made from the leaves of this plant. Viviparous leaves are also effective for compresses. Viviparous have already become a permanent fixture on the shelves of herbal stores and you can buy ready-made preparations there, they can be agents for internal and external use, for example liquids, gels, creams, ointments.

Conclusion. The viviparous plant is a plant with a wide range of medicinal uses. It has more healing properties than the popular aloe.

Keywords. application, medicinal plant

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Vitamin D

Introduction. Vitamin D, also known as the "sun vitamin", is produced in our body by ultraviolet B rays and is very important to our health. Vitamin D is one of those fat-soluble.

Aim. To present vitamin D.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. Vitamin D plays a very important role in the body, including: it stimulates the absorption of calcium and phosphorus, thanks to which it has a huge impact on the proper formation of bones in children and infants, and on their proper density. Vitamin D can prevent high blood pressure, heart disease, allergies, anemia and diabetes. It is very important that the body is supplied with the right dose of vitamin D, because both excess and deficiency have a negative impact on human health. Many flu can be prevented by having sufficient levels of vitamin D. But vitamin D can not only be produced in the body, it can also be taken in through diet or supplements. If people don't consider at least one of the three options for taking vitamin D, it can lead to vitamin D deficiency, which is already a global health problem.

Conclusion. Recent studies have suggested that besides its well-established roles in bone metabolism and immunity, vitamin D status is inversely associated with the incidence of several diseases, such as cancers, cardio-vascular diseases, and neurodegenerative diseases.

Keywords. benefits, deficiency, global health issue, sunlight

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Lavender oil

Introduction. Lavender oil is a natural product that is obtained from fresh flowers of narrow-leaved lavender (*Lavandula angustifolia*). Narrow-leaved lavender has a large number of stems that rise upwards, the stem of the plant is green and ends with a purple inflorescence. Lavender is found in the countries of the Mediterranean basin – Spain or France, but also in Poland.

Aim. To present lavender oil and its application.

Material and methods. The literature review was prepared on the basis of the databases contained in the PubMed and on the basis of the ScienceDirect scientific literature platform.

Analysis of the literature. Lavender oil has a straw-yellow color and a characteristic herbal-floral scent. This oil is obtained by distilling a suspension of developed cut flowers together with part of the stem. Various types of lavender are used in the production of lavender oil, but the most common is narrow-leaved lavender, also known as lavender (*Lavandula officinalis*). The composition of lavender oil largely depends on the species of plants from which it was produced, their place of occurrence, the period in which the raw material was harvested, as well as the time of steam distillation. Lavender oil ingredients are: linalool, linalool acetate, lavendulol, ß-caryophyllene, terpinen-4-ol, cineol, ocymene, camphor and active substances: tannins, coumarins, phytosterols, flavonoids and phenolic acids. Lavender oil is widely used in aromatherapy. It is one of the few oils that can be applied directly to the skin. Medical lavender has an analgesic effect, therefore it is recommended for people struggling with headaches and migraines. This plant also works as an antispasmodic, hence its use in digestive problems.

Conclusion. Lavender oil has long been used as a perfume, for aromatherapy, and for skin applications.

Keywords. application, lavender oil, medicinal plant

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Anatomical variability of the aortic arch – left vertebral artery exit in clinical terms

Introduction. The aorta is the most important artery in the body, it is a great trunk from which all vessels supplying oxygenated blood to the entire system depart. The aortic arch varieties are numerous, although relatively rare; they mainly concern its location, course and the point of departure of its main branches and their number. The vertebral artery is the first branch extending from the ascending subclavian artery. The role of the vertebral artery is particularly important due to the joining of the right and left arteries, forming the basal artery involved in the formation of the arterial circle of the brain.
Aim. The aim of the study is to present a broader perspective of the causes of dizziness and headaches, or strokes as a consequence of vascular anomalies.
Material and methods. Work on the anatomical specimen and analysis of review papers and descriptions of the variability of the aortic arch with clinical consequences.
Results. On the specimen, which a group of students worked on during the meetings of the Anatomical Scientific Club, variability was noticed in the departure of the left vertebral artery directly from the aortic arch between the left common carotid artery and the left subclavian artery, interestingly, this artery also shows variability in the path through the holes of the transverse processes as it enters the opening of the transverse process of the fifth vertebra. In its further course, no other variations were noticed. It reaches the slope of the occipital bone, where it connects with the right vertebral artery, creating a basal artery that further supplies blood to the posterior arteries of the brain.
Conclusion. The essence of the early diagnosis of arterial anomalies, especially those involved in cerebral vascularization, is important due to the possibility of diagnosing unexplained loss of consciousness in patients or cerebral infarctions associated with hypoxia caused by compression of structures within the vessel, or an increased risk of extravasation caused by abnormal location of the artery.
Keywords. vertebral artery, anomaly, aortic arch

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A report on the activity of the Students' Association of Students

The review of current research was presented.

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Contrast Enhanced Spectral Mammography – role in the detection of breast cancer

Introduction. Spectral mammography is an accurate diagnostic tool to assess the nature of lesions assessed as benign and suspicious in classical mammography.

Aim. The aim of the study is to assess the Contrast-enhanced spectral mammography (CESM) in the detection of breast cancer as a complementary test after classical mammography.

Material and method. The records of 40 patients who had breast cancer confirmed in the histological and pathological examination were assessed retrospectively. Classic mammography tests were performed for all patients, which were rated at 0, 2, 3, 4 or 5 in the BIRADS scale, respectively. Due to the "oncological burden" (all the patients had a family history of breast cancer) as well as a significant glandular component in the structure of the breast (some of them) – spectral mammography was performed for all of them.

Results. The results obtained in classical mammography (BIRADS scale), the CESM evaluation and the hist-pat result were compared. THE RESULTS: For 40 patients who had breast cancer confirmed (hist-pat test), classical mammography assessed: 0 BIRADS for 3 patients, 2 BIRADS for 5 patients, 3 BIRADS for 6 patients, 4 BIRADS for 16 patients, 5 BIRADS for 10 patients. In the subsequent spectral mammography, focal changes were identified in all cases, which were assessed as neoplastic changes. Among 40 cases, 2 patients had two lesions in one breast and one patient had lesions in both breasts (the change in the other breast was not visible in classic mammography – assessment 1 BIRADS).

Conclusion. Spectral mammography allows to detect changes that were not visible either in classical mammography (1 BIRADS assessment). Spectral mammography may be useful in shortening the diagnostic path in case of patients for whom, due to the glandular structure of the breast, it is advisable to perform supplementary examinations (targeted/enlarged photos or ultrasound).

Keywords. breast cancer, classical mammography, spectral mammography

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The use of computed tomography in a 55-year-old patient with a triatrial heart and atherosclerotic lesions in the coronary vessels

Introduction. Communication between the upper and lower levels of the atrium takes place through a wide canal in the fibrous-muscular septum with a diameter of about 18 mm.

Aim. The aim of the study is to present a case of a patient with a rare developmental defect, consisting in the presence of a two-partial left atrium, and atherosclerotic lesions in the coronary vessels.

Description of the case. In a 55-year-old patient, a CT scan of the heart was performed using a scanning method and after intravenous administration of a contrast medium. Layers of a width of 0.6 mm were used with ECG gating at a heart rate of approximately 55/min. Coronary artery calcification (Calcium Score) was assessed using the SmartScore GE application. The calcification index was 489. A slight enlargement of the heart was visualized. The right ventricle, right atrium and left ventricle without structural changes, while the left two-partial atrium (left triatrium heart) without communication with the right atrium. Mobility disorders were not detected in the mitral valve. Ascending aorta and pulmonary trunk of correct width. Trilobal aortic valve. Heart pad 34x36 mm, sinus-aortic connection – 28 mm. Left atrial auricle without thrombi. The study showed no changes in the right coronary artery (RCA), the posterior descending artery (PDA) and the right marginal branch (AM) leading from the right coronary artery (RCA). First and third diagonal branches of the left coronary artery (Dia1, Dia3) recessive, no change. Single, calcified atheromata were detected in the left artery (LMA) and in the initial section of the second diagonal branch (Dia2). However, they did not significantly affect the vessel lumen. In the proximal and medial sections of the anterior descending artery (LAD), quite numerous calcified atherosclerotic plaques with at least two significant narrowings of the vessel wall were visualized. In the initial section of the marginal branch (LMB) there are single, calcified atherosclerotic plaques and a single narrowing of the vessel lumen by about 50%. No changes were detected in the further sections of the LMB.

Conclusion. In the described case, the use of computed tomography allowed the visualization of a developmental heart defect (triatrial heart), the assessment of coronary artery calcification and the presentation of atherosclerotic plaques, which show hyperdense.

Keywords. atherosclerotic changes, computed tomography, triatrial heart

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Brain aneurysm in a 69-year-old patient – case report

Introduction. Computed tomography of the head did not reveal any extravasated blood or post-traumatic changes in bone structures. Pathological structures and extensive edema were visualized in the right temporal lobe.

Aim. The aim of the study is to present the use of imaging studies in a patient with a brain aneurysm.

Description of the case. The patient was hospitalized in the orthopedic ward due to femoral neck fracture following a fall. Due to consciousness disturbances and deteriorating contact, a neurological consultation was called for her, after which it was decided to perform a computed tomography scan of the head with contrast agent administration. The presence of an aneurysm or tumor was suspected. MRI revealed the presence of a heterogeneous, multi-compartment mass in the right temporal region with localized edema and a signal suggesting a partially clotted aneurysm of the right middle cerebral artery with a possible intracerebral hematoma. An angiography examination (rotational DSA of the right internal carotid artery) was performed. A partially clotted, large, sacculated aneurysm with a neck 6.3 mm wide was visualized in the bisection of the right middle cerebral artery. There was a second sacculated aneurysm with a diameter of 3 mm and a neck width of 2.7 mm on the lower circumference of the right middle cerebral artery. The patient was discharged from the hospital and referred to the neurosurgical ward.

Conclusion. In the described case, the final diagnosis was obtained on the basis of an angiographic examination performed after computed tomography and magnetic resonance imaging.

Keywords. angiography, brain aneurysm, computed tomography, magnetic resonance

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Aromatic compounds in honey

Introduction. For centuries, honey has been one of the food products that many people have become one of the basic food products without which they cannot imagine their daily menu. Despite the daily hospitality at our tables, not everyone is aware of what the unique aroma of this product is due to. As you know, honey is a natural product of honeybees that produce it from flower nectar. Depending on the type of plant from which it is taken, the properties of the honey produced may differ significantly.

Aim. To present aromatic compounds found in honey.

Material and methods. In this review, publications published in the PubMed database were used.

Analysis of the literature. Essential oils as well as mono- and sesquiterpenes play a key role in the aroma and aroma of honey. They are organic compounds (hydrocarbons) belonging to the group of terpenes. They can occur in various cyclical and non-cyclical forms and they are the main components of essential oils that are contained in honey. The lactones, for example, are responsible for a note of bitterness. Another type of chemical compound important in recognizing the type of plant from which a given honey was produced are polyphenols - organic chemical compounds from the phenol group, containing at least two hydroxyl groups attached to the aromatic ring. Polyphenols are a natural component of plants, hence flavonoids are considered a honey marker. In addition, they are responsible for antioxidant properties. It is worth adding that another chemical compound allows to determine the freshness of honey – it is 5-hydroxymethylfurfural. It is a complex organic compound that is derived from aldehydes and alcohols and has the furan skeleton structure. In honey, it acts as a fragrance, but it is also extremely important due to its chemical properties. It is formed under the influence of heat in a number of chemical reactions as the end product of the reaction between reducing sugars and amino acids.

Conclusion. Therefore, the examination of its amount in honey makes it possible to distinguish from which plant the honey sample is tested.

Keywords. aromatic compounds, honey, polyphenol