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UMFST – UMCH RESEARCH DAY

May the 6th 2023

Hamburg, Germany

BOOK OF ABSTRACTS

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May the 6th 2023 Hamburg, Germany

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THE PROTECTIVE PROPERTIES OF FOLIC ACID ON FETUSES OF WOMEN WITH EPILEPSY TREATMENT

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Background: Folic acid insufficiency in a woman before and during pregnancy can lead to fatal congenital malformations in the fetus, with a worldwide prevalence of anencephalus and spina bifida in newborns as high as 8.7 per 1000 live and stillbirths, while supplementation with folic acid during pregnancy has significantly reduced the prevalence of spina bifida in the 2020s, in Germany, to only approximately 1 per 1000 neonates. **Material and methods:** The aim of this study was to establish the mechanism of action, dose, and importance of folic acid supplementation during pregnancy in women with antiepileptic treatment. A search was conducted on PubMed and PLos databases using as key words 'folic acid and antiepileptic drugs and pregnancy'. **Results:** In a medical context folic acid is commonly used as a prenatal supplement to prevent neural tube defects (NTDs) during embryogenesis. The prenatal treatment with folic acid only requires a minimum dosage of around 0.4 mg of folic acid supplement a day according to the Center of Disease Control. In women predisposed to bear a child with neural tube defects or with antiepileptic medication during pregnancy, the dosage can be increased to 5 mg a day. A major risk factor for spina bifida in a fetus is the treatment of epilepsy with Phenytoin, Phenobarbital, Valproic acid and Carbamazepine in the mother during the pregnancy. **Conclusions:** Discussion: The available research regarding antiepileptic drugs (AEDs) used in pregnancy and the possible protective properties of folic acid in those cases offer only insufficient data. The mechanism of action of folic acid and the role of antiepileptic drugs in the development of spina bifida are not fully understood today and offer a great potential for preventing spina bifida with higher precision.Conclusions: Further investigations to establish the exact dosage to achieve the maximum protective effect of folic acid in AED treatment are still needed.

Keywords: Spina bifida, folic acid, neural tube defects (NTDs), anti-epileptic drugs (AEDs), epilepsy in pregnancy

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HEALTH BENEFITS AND RISKS OF A CARNIVORE DIET, LITERATURE REVIEW

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Background: Introduction: Historically, diets have been utilised to treat or manage ailments and more recently are used to promote weight loss and alleviate food intolerances and subsequent pathologies. This article examines if the carnivore diet, a dietary pattern that emphasizes animal-based foods and eliminates plant products, can yield health benefits associated with weight loss and food intolerances. Meat based diets have been underexplored due to recent uprising of ecological and ideological concerns regarding meat production.Objective: This article aims to delve into the potential health advantages and detriments of the carnivore diet. **Material and methods:** Congregating the most reliable information, an overview of literature data was conducted on PLos and PubMed using as keywords 'carnivore diet and weight loss' or 'carnivore diet and food intolerance'. **Results:** The present study shows clear advantages regarding the influence of diet on the immune system, weight loss by association with low carbohydrate intake, and positive impact regarding food intolerances and allergies. These dietary forms seem to be nutritionally viable. Most of the evidence is based on self-reported cases, and while the majority displays the aforementioned benefits there is also literature on the limitations of self-reports, especially in the natural sciences. For instance, reports with negative outcomes resulted in contradictory claims of exposure to hyperammonaemia, risk of ketosis and ketoacidosis, hyperuricemia, and even fatal cases of lean meat poisoning being reported in the literature. Finally, it appears to be ecologically non-sustainable on a large scale. **Conclusions:** Literature data present the health benefits of a high-protein (carnivore) diet. However, following a restrictive diet in terms of nutrient and calorie intake must be well-documented, with continuous evaluation of some biochemical and physiological parameters indicating metabolic status. Overall a lack of high-quality studies, prospective or controlled trials with concrete evaluation criteria, is conspicuous. A carnivore diet seems safe enough to encourage future prospective and even controlled trials to determine concrete benefits in relation to other diets.

Keywords: Carnivore diet, Ketogenic diet, Palaeolithic diet, Weight loss, Nutrition

THE EFFICACY OF ANTIOXIDANTS IN PREVENTING THE HARMFUL EFFECTS OF MENTAL STRESS

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Background: An imbalance between reactive oxygen species (ROS) and the antioxidant defense system is known as oxidative stress. ROS are generated by endogenous and exogenous factors and can lead to the development of various pathologies. Growing evidence has found that mental stress is able to induce oxidative stress. Antioxidants have been proposed as a preventative measure, to avoid negative outcomes of stressful periods. **Material and methods:** A comprehensive review of existing and recent literature was conducted on PubMed and Plos databases. The search was performed using the keywords "oxidative stress and mental stress", "antioxidants", "reductive stress" and "reactive oxygen species (ROS)". **Results:** The generation of ROS occurs through both endogenous factors, such as oxidative metabolism of hormones and enzymatic reactions, and exogenous factors, including nutrition, medication, and environmental factors. Pathologic conditions such as cardiovascular disease, neurodegenerative disease, diabetes, and cancer can be a result of oxidative stress. Mental stress may increase the risk of developing these pathologies by inducing oxidative stress through inflammatory responses, leading to cellular damage. Antioxidants such as vitamins C, E, A, coenzyme Q, minerals like selenium, and omega-3 polyunsaturated fatty acids, have been suggested to prevent the negative outcomes of mental stress-induced oxidative stress. However, reductive stress through the excessive use of antioxidants may cause more harm. Therefore, maintaining a balance between the production of reactive oxygen species (ROS) and the intake of antioxidants is detrimental for ideal health. **Conclusions:** Mental stress-induced oxidative stress is a complex phenomenon with significant health implications among young individuals. Antioxidants have been suggested to reduce the harmful effects of stress periods. However, more research is required to establish the effectiveness of antioxidant supplementation, as excessive use may cause reductive stress and herewith be harmful. This work was supported by the George Emil Palade University of Medicine, Pharmacy, Sciences and Technology of Tâ̂rgu Mures̨, Research Grant number 165/7/10.01.2023

Keywords: Oxidative stress, Mental stress, Antioxidants, Reactive oxygen species, Preventative measure

SPECIALIZED PRO-RESOLVING LIPID MEDIATORS AS PREVENTIVE AND THERAPEUTIC AGENTS OF CHRONIC COMPLICATIONS IN DIABETES MELLITUS

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Background: Diabetes Mellitus (DM) is defined as a group of metabolic pathologies characterized by inadequate glycemic control. Type 1 and type 2 DM represent the main subclassifications displaying distinct pathophysiological profiles; namely autoimmune origin with consequent beta cells destruction in the former, and insulin deficiency and resistance in the latter. Long-term hyperglycemic status leads to protein glycation and formation of advanced glycation end products (AGEs) which, by instigating the creation of a pro-inflammatory microenvironment, play a pivotal role in the pathogenesis of chronic complications of DM, such as retinopathy, nephropathy, and atherosclerotic cardiovascular diseases. Specialized pro-resolving lipid mediators (SPMs), in particular lipoxins (LXs), have been accounted as "resolvers of inflammation" in a wide spectrum of disorders, therefore their application in prevention and treatment of long-standing DM complications is contemplated.Objective: The aim of this literature review is to provide a state-of-the-art perspective on the effectiveness of SPMs as preventive and therapeutic strategies in the management of DM-associated chronic complications. **Material and methods:** A search of English literature was performed on PubMed and Google Scholar on February 16, 2023. An analysis was carried out by including the keywords "diabetes mellitus", "inflammation", and "pro-resolving lipid mediators". A further selection was conducted to encompass exclusively the sources pertaining to chronic complications of DM. **Results:** Studies involving SPMs in diabetic ApoE $^{-/-}$

murine models display how injections of LXA4 and its synthetic analog, Benzo-LXA4, adequately modulate kidney diseases in streptozotocin treated mice by reducing glomerular and mesangial matrix expansion. Furthermore, in vivo investigations demonstrate an attenuation in total aortic atherosclerotic plaque development accompanied by a significant decrease in collagen staining in the LXs group, as opposed to the non-treated animals. Human studies on ex vivo atherosclerotic lesions have exposed carotid plaques to LXA4, which promptly mitigated the expression of pro-inflammatory cytokines, specifically Interferon Gamma (IFN-γ), Interleukin 1 Beta (IL-1β), and Tumor Necrosis Factor Alpha (TNF-α). **Conclusions:** SPMs efficiently prevent and reverse chronic complications of DM. Considering the paucity of human studies in this context, further research efforts are of utmost importance in order to decrease the global burden of this disease through innovative therapeutic paradigms.

Keywords: diabetes mellitus, inflammation, chronic complications, specialized pro-resolving lipid mediators

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NEW APPROACH ON FRUCTOSE METABOLISM

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Background: Fructose is a naturally occurring monosaccharide that is commonly found in fruits such as figs, dates and pears and honey in a free form or in the structure of sucrose. Although it was previously believed that dietary fructose was only metabolized in the liver, there is new evidence to suggest that it is also processed in the small intestine, where it worsens the intestinal epithelial barrier.The goal of the research is to understand the complex biochemical processes involved in the metabolism of fructose and to investigate how excessive ingestion of this monosaccharide might result in the emergence of a number of clinical diseases. **Material and methods:** A thorough review of the scientific literature, using databases such as PubMed, Scopus, and Web of Science, provided information on molecular structures, metabolic pathways, and pathogenic processes. **Results:** Even though it was once believed that dietary fructose was only metabolized in the liver, where it is transported by the portal circulation, it has recently been discovered that dietary fructose is also metabolized at its site of absorption, the small intestine, especially when it is consumed at physiological concentrations. No matter its form—pure fructose, sucrose, or HFCS (High fructose corn syrup)—fructose is transported intracellularly by GLUT5, a fructose-specific transporter that is expressed in the apical pole of the enterocyte luminal membrane. If people consume moderate to high levels of fructose, their ability to absorb fructose may be reduced, and they may experience gas and diarrhea. **Conclusions:** Greater sweetening power and a low glycemic index are two benefits of using fructose as a sweetener, but can also have harmful effects. Although fructose and glucose have the same chemical formula (C6H12O6), fructose is metabolized by ketohexokinaza (KHK) which is not feedback inhibited, resulting in fast accumulation of Fructose-1-Phosphate, a potential toxic intermediate, implying that among the two monosaccharides, fructose is more hazardous.

Keywords: Dietary Fructose, HFCS, Fructose Metabolism, GLUT5

PREGNANCY RELATED ALTERATION IN CYP1A2/CY3A4 ENZYME ACTIVITY IN ANTIPSYCHOTIC THERAPY

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Background: **Introduction:** Clozapine, a second-generation antipsychotic agent, used in the pharmacological treatment of schizophrenia is also approved for pregnant patients. Several studies have shown the effect of the increased synthesis and secretion of pregnancy-related hormones (PRHs) in altering the function of multiple CYP enzymes in an isoform specific and concentration-dependent manner. **Objective:** The present review study aims to assess the impact of pregnancy on the CYP1A2/CY3A4 enzyme activity in the metabolization of the second-generation antipsychotic clozapine, and to outline the magnitude of pregnancy linked alteration in the function of drug metabolising enzymes. **Material and methods:** **Materials and methods:** In the study were included articles from PubMed regarding the discussed topic as results from key word search such as cytochrome P450 system enzyme, pregnancy related therapy and antipsychotic agents.: In the study were included articles from PubMed regarding the discussed topic as results from key word search such as cytochrome P450 system enzyme,

pregnancy related therapy and antipsychotic agents. **Results:** **Results:** Pharmacokinetic(PK) studies, conducted in pregnant women, intending to evaluate safe and efficient dosing regimens face numerous difficulties. First, pregnant women remain orphans of therapeutic options offered to non-pregnant counterparts. Second, non-sufficient research data are available from experimental studies regarding modified drug metabolism during pregnancy. The exact underlying mechanism responsible for variations in the expression of different P450 isoforms remains unanswered at the present. Different approaches in investigating and further understanding the interaction between altered clozapine demyelizing enzymes CYP1A2 (primarily) and CYP3A4 are presented. Preliminary work on the prediction of clozapine PK during the status of pregnancy was undertaken relaying on a physiologically based pharmacokinetic (PBPK) model. The experimental values were indicating a decrease in the CYP1A2 activity; on the other hand, CYP3A4 activity was increased. For the further understanding it would be a point of interest to apply the increased metabolization of a non-pharmaceutical compound in estimating the change in drug metabolization.Results: Pharmacokinetic(PK) studies, conducted in pregnant women, intending to evaluate safe and efficient dosing regimens face numerous difficulties. First, pregnant women remain orphans of therapeutic options offered to non-pregnant counterparts. Second, non-sufficient research data are available from experimental studies regarding modified drug metabolism during pregnancy. The exact underlying mechanism responsible for variations in the expression of different P450 isoforms remains unanswered at the present. Different approaches in investigating and further understanding the interaction between altered clozapine demyelizing enzymes CYP1A2 (primarily) and CYP3A4 are presented. Preliminary work on the prediction of clozapine PK during the status of pregnancy was undertaken relaying on a physiologically based pharmacokinetic (PBPK) model. The experimental values were indicating a decrease in the CYP1A2 activity; on the other hand, CYP3A4 activity was increased. For the further understanding it would be a point of interest to apply the increased metabolization of a non-pharmaceutical compound in estimating the change in drug metabolization. **Conclusions:** **Conclusions:** The mentioned results would demonstrate an overall increase in maternal blood serum concentration of the psychotropic agent clozapine. However, to date there has been little understanding on the true magnitude of change in the Cytochrome P450 enzyme activity. For the accurate prediction of maternal and foetal drug exposure the integration of data from in vitro studies using models and appropriate in vivo studies with clinical findings is critical. Additional, attentive inclusion of pregnant women in studies would implement relevant findings regarding safety and efficacy of therapeutics to address the existing gaps in our knowledge and to improve both maternal and foetal health outcomes.

Keywords: Cytochrome P450, Pregnancy, Antipsychotic therapy, Drug interactions

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IMPLICATIONS OF BETA BLOCKER USE IN HYPERTHYROIDISM

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Background: Hyperthyroidism is a medical condition characterized by an excess production of thyroid hormones, which leads to numerous symptoms concerning the basal metabolic rate and thermogenesis. The fundamental pharmacological treatment includes antithyroid medications, which reduce the production of thyroid hormones, however, their effect is delayed, and may not provide immediate relief of symptoms. An excess of the active metabolite triiodothyronine also affects the cardiovascular system by exerting a regulatory effect on the beta 1-adrenergic receptor gene in ventricular myocytes. This is why in the therapeutic scheme beta blockers are also included. Therefore, the question arises, which effects do beta blockers exert on the background of hyperthyroidism.Objective: The intention of this systematic review is to highlight the effects of beta blockers in the treatment of hyperthyroidism, providing synthetized data about the degree to which beta blockers affect thyroid hormone levels in hyperthyroidism, and relative clinical implications for the management of the disease. **Material and methods:** The research material was retrieved from PubMed articles, published in English in peer-reviewed journals between 1999 and 2022, using search terms about beta blockers in relation with hyperthyroidism. **Results:** The included studies were conducted in various countries and included randomized controlled trials and observational studies. The beta blockers considered in the studies included propranolol, atenolol, metoprolol, and nadolol. Overall, the collective estimate of the effect of beta blockers on thyroid hormone levels was a significant decrease. These agents inhibit the peripheral conversion of Levothyroxine to Triiodothyronine, further reducing the symptoms of hyperthyroidism provoked by the metabolically active compound. Propranolol besides lowering Triiodothyronine levels, decreases cardiovascular symptoms, like tachycardia and hypertension and due to its lipophilic composition counteracts central nervous system effects, improving clinical outcome in acute phase and

possible exacerbations. **Conclusions:** In conclusion, the present research suggests that the use of beta blockers decreases Triiodothyronine levels and symptoms of hyperthyroidism on the sympathetic system such as tremors, high blood pressure and tachycardia. It is therefore an important feature in the conservative pharmacological treatment and could help clarify the clinical implications of beta blocker use in hyperthyroidism, and guide the development of more targeted and effective treatments for this frequent and challenging condition.

Keywords: Beta blockers, hyperthyroidism, acute phase management

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IMPLICATIONS OF PROSTAGLANDINS IN ERECTILE DYSFUNCTION

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Background: Erectile dysfunction is a medical condition which is defined as the inability of getting an erection or the inability to maintain an erection sufficient for intercourse. It is divided into two main categories, mainly organic or psychogenic erectile dysfunction. Prostaglandin E1 (PGE1) binds to PGE1 receptors which in turn exhibit an intracellular activation of adenosine monophosphate leading to a smooth vascular relaxation and vasodilation. Therefore, the question arises, which effects do prostaglandins exert on the background of erectile dysfunction.Objective: The objective of this abstract is to emphasize the mechanism of action prostaglandins exert to be able to treat erectile dysfunction and to provide some details about erectile dysfunction in general. **Material and methods:** The research material was retrieved from published articles. The research was conducted in a way that information was gathered using search terms about prostaglandins in relation with erectile dysfunction. Then articles were selected by pre-defined inclusion and exclusion criteria. **Results:** The research findings indicate that intracavernous or intraurethral prostaglandins, e.g. Alprostadil, can be used to treat erectile dysfunction while exhibiting less commonly systemic side effects than systemic medication, such as phosphodiesterase-5 inhibitors, do. Prostaglandins are considered second line agents after oral medications. Erectile dysfunction is of major medical importance as up to 80 percent of men aged 75 suffer under this condition. Some organic reasons for erectile dysfunction include a decreased supply from central or peripheral neural pathways, arterial blood supply, a dysfunction of the endothelium or hormonal disorders. The mechanism of action behind an intracavernous or intraurethral prostaglandin (e.g. Alprostadil) use is that the prostaglandin E1 receptors are activated which is followed by the activation of the cyclic adenosine monophosphate pathway. This in turn leads to a smooth muscle relaxation of blood vessels, due to a decreased influx of calcium ions, and vasodilation increasing the blood volume in the penis and eventually leading to an erection. Worth mentioning is that there are a few contraindications (e.g. sickle cell anaemia, severe coagulopathy, severe venous incompetence) as well as adverse effects (e.g. Peyronie disease, penile pain, dizziness) which should be carefully evaluated to determine if the patient is an appropriate candidate for prostaglandin treatment. **Conclusions:** To conclude, this review highlights that prostaglandins lead to an increase of blood supply to the penis through the cAMP pathway which in turn helps men with erectile dysfunction to be able to get an erection and to practice intercourse.

Keywords: prostaglandin, erectile dysfunction, cAMP

MORPHOLOGICAL FEATURES OF THE VOMERONASAL ORGAN IN HUMANS

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Background: The vomeronasal organ (VNO), also known as Jacobson's organ, is a chemosensory structure located in the submucosal layer of the base of the nasal septum in vertebrates. The main function of the VNO is detection and processing of pheromones, which serve as triggers for species-specific behaviors, such as reproduction, communication, and social practices. Particularly in primates, the VNO has been shown to modulate sexual attraction and mating; however, the exact mechanisms pertaining to its function have not yet been fully elucidated. In humans, this organ is not well-developed as opposed to other mammals, and furthermore, the absence of an accessory olfactory bulb receiving inputs from its receptor cells suggests that the human VNO has no sensory function.Objective: This study aims to offer a comprehensive analysis of the developmental, anatomical, and histological aspects of the VNO in humans based on literature data, and furthermore, to provide

indications for the application of morphological findings in the clinical and surgical settings. **Material and methods:** An extensive literature search was carried out on Google Scholar and PubMed on March 11, 2023. Articles selection encompassed solely results in English, using the keywords "vomeronasal organ", "Jacobson's organ", and "humans", with a distinct focus on publications within the 2009-2023 timeframe. **Results:** In prenatal humans, the VNO development begins with its primordium, which is present at 33 days of embryological development. Subsequently, invagination and tubular formation occur, extending until day 43, when the primordium disappears, and the complete tubular stage is reached. Henceforth, the VNO undergoes volumetric growth and luminal expansion. Initially, the lining of the organ is composed of non-ciliated cuboidal epithelium, which differentiates into pseudostratified ciliated columnar epithelium at 16 weeks of development. The lamina propria, containing serous acini, is typically observed at 18 weeks of development. The VNO persists throughout the fetal period and may be identifiable in adults as a pit situated posterior to the anterior nasal spine, displaying a great degree of structural variability among individuals. Despite its characteristic bilateral localization, a sporadic unilateral configuration is not to be excluded. The VNO's macroscopically evident appearance does not directly correlate to its histological presence. **Conclusions:** The VNO is a vestigial structure that may persist in adult life. Individual-based considerations of shape, dimensions, and orientation variation of the VNO should be accurately evaluated in the pre-operative planning of otorhinolaryngologic procedures.

Keywords: vomeronasal organ, Jacobson's organ, species-specific behaviors, otorhinolaryngology

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FENNEL ESSENTIAL OIL EFFECTS IN DIABETES - A PRECLINICAL STUDY

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Background: Diabetes is a chronic medical condition that can have serious health consequences if left untreated. Complications may include cardiovascular disease, neuropathy, retinopathy, cataracts, and nephropathy. Complementary therapies may offer potential benefits for managing diabetes, such as improving oxidative status, reducing anxiety, enhancing sleep quality, regulating blood sugar levels, delaying the onset of diabetic complications, and other effects dependent on the specific herbal product. Aromatherapy has gained a lot of interest in the recent years and the overwhelming majority of empirical proof raises the need of pharmacological evaluation of the essential oils. The aim of this study was to evaluate the potential of fennel essential oil (FEO) to alleviate symptoms and complications of diabetes in rats induced with streptozotocin. **Material and methods:** Fennel essential oil was obtained by hydro distillation, prior the beginning of the study. Diabetes was induced by intraperitoneal injection with streptozotocin. The rats were divided after simple randomization into four groups, 8 rats/group as follows: diabetic control, diabetic rats treated with 300 mg/kg metformin, diabetic rats treated orally with fennel essential oil, and diabetic rats treated topically with fennel essential oil. Oral glucose tolerance test was performed in the fourth week of treatment. Weight and glucose variations were weekly monitored. At the end of the experiment the eyes were removed and the lenses were isolated by retro-orbital incision for cataract evaluation. Further, lenses that presented no signs of cataract were used for the ex vivoanticataractogen effect of fennel essential oil. **Results:** Administration of FEO orally and topically for four weeks led to a significant decrease in blood glucose levels, with no significant differences between the two routes of administration. The results from the ex vivo evaluation, showed that fennel oil is capable of preventing the opacity changes in lenses. **Conclusions:** By topical administration, the volatile oil quickly reaches the bloodstream due to rats' rich vascularity and the thin layer of skin. Data from the literature attribute the antihyperglycemic effect to trans-anethole, but further studies are still needed in order to fully understand the antidiabetic potential of fennel essential oil.

Keywords: diabetes, fennel essential oil, cataract

LEARNING BY READING. PHARMACOLOGY – DIFFICULT FOR MEDICAL STUDENTS BUT ALSO FOR THE CHATGPT?

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Background: Artificial Intelligence is a field that combines computer science and robust data sets to enable

problem solving. AI can be used to solve everyday questions as well as more complex problems. While we humans have to practice and try to understand and react to problems, question addressed to AI (e.g. chat GPT) are instantaneously answered. Universities provide knowledge through lectures and teaching materials, while acquired knowledge is afterwards assessed via different exam types. The aim of the present study was to compare the quality of AI's answers to pharmacological questions compared to humans after self-study of the provided teaching material. **Material and methods:** The UMCH pharmacology research team conducted a prospective study to evaluate the quality of answers provided by responders with and without medical knowledge in comparison with answers received by AI. Phase 1 of the study consisted of a short meeting with the participants during which they were asked to study a 2-page presentation on a new pharmacological topic over a period of 1 week. During the second meeting a test-type questionnaire was completed by the participants. The research team posed the same questions to ChatGPT. Results were statistically analysed to evaluate the differences between the 3 -groups of responders and the ChatGPT. **Results:** Participants were assigned into 3 different groups: medical students who already studied pharmacology; medical students who did not yet study pharmacology and non-medical university staff. The questionnaire consisted of 3 different types of questions: multiple choice test questions, true-false statements, and open questions. During the statistical analysis we compared the quality of responses between the different groups of participants as well as between the different question types. The evaluation returned that there is a statistical difference between medical student responders and non- medical responders; while compared to Chat GPT, we found that all questions were answered correctly by Chat GPT. Statistically, Chat GPT showed a one hundred percent correct answer rate. The evaluation returned that there is a statistical difference between medical student responders and Chat GPT. **Conclusions:** According to the results of the study we can conclude that the multiple-choice questions returned the greatest variability in case of human responders while in case of artificial intelligence the responses returned to each different type of question were similar in quality and exceeded the average achieved even by responders with both medical and pharmacological knowledge.

Keywords: self-study, artificial intelligence, test-type evaluation

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ON-SITE TEACHING AND EVALUATION. PHARMACOLOGY – DIFFICULT FOR MEDICAL STUDENTS BUT ALSO FOR THE CHATGPT?

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Background: Artificial intelligence models are increasingly used in all areas of science and research as well as in daily routine activities. Evaluation of responses received from human subjects compared to those received from ChatGPT may represent explanations for differences in study methods and question types used during evaluations. The aim of the current research was to evaluate answers received from medical students and participants without medical knowledge after a short onsite lecture and to compare results with the answers provided by AI. **Material and methods:** The study consisted of 2 consecutive 45-minute sessions during which pharmacology teachers and respectively medical students with previous pharmacological knowledge gave a 20-minute short presentation on a new pharmacology topic to participants. Immediately after each phase, participants received an evaluation form consisting of 15 questions. Statistical analysis was performed to evaluate the differences between the participant groups and ChatGPT separately for the different types of questions. Participants were assigned into 3 different groups: medical students who already studied pharmacology; medical students who did not yet study pharmacology and non-medical university staff. The questionnaire consisted of 3 different types of questions: multiple choice test questions, true-false statements and open questions. **Results:** The statistical analysis consisted of the comparison of the quality of answers. One of the major limitations of the study was caused by the low number of responders. We have performed multiple evaluation to receive the most accurate results possible. Data obtained was compared between the four different groups of responders as well as between the different type of questions. The evaluation returned that there is a statistical difference between medical student responders and non-medical responders. Compared with ChatGPT, we observed that all question types were answered correctly by it. When comparing the results received after teacher and student presentation to each other we observed that all groups scored higher in the questionnaire provided after the student presentation. **Conclusions:** Artificial intelligence is already part of, and it is predicted to become even more involved in our lives. The information provided by the current study underlines that previous knowledge in the field of medicine respectively pharmacology improves the capacity to provide correct answers. But even in case of

responders with the highest knowledge level there was statistical difference when compared with hundred percent correct answers provided by AI to each type of question after both lectures.

Keywords: artificial intelligence, pharmacology lecture, evaluation

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TARGETING PACAP38: A NEW AVENUE FOR MIGRAINE THERAPY

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Background: Background: Migraine affects over a billion people worldwide, making it the most widespread and incapacitating neurological condition. The disability is defined as a headache that lasts from 4 to 72 hours and is often characterized by moderate to severe unilateral pulsating pain, nausea and photophobia. Two endogenous neuropeptides, calcitonin gene-related peptide (CGRP) and pituitary adenylate cyclase-activating peptide-38 (PACAP38), have been found to be involved in migraine. Recently there has been a discovery for the prophylactic treatment for migraines, which includes the application of monoclonal antibodies (mAbs) that block the signaling pathway of calcitonin gene-related peptide (CGRP). Nevertheless in 40% of migraine patients this therapeutic approach is not efficient. PACAP has been found in sensory nerve fibers, and it has the ability to cause migraines by dilating cranial arteries when infused into patients. Because of its properties, PACAP is seen as a promising target for antibody therapy.Objective: The aim of this work is to assess the new possible target for the treatment of migraine, involving the neuropeptide PACAP38. **Material and methods:** A comprehensive review of the literature on different databases (PubMed, ScienceDirect) was done, using as MESH-Terms "migraine disorders", "CGRP", and "PACAP". The most relevant findings were used for this abstract. **Results:** PACAP38 infusion resulted in a migraine-like attack in 75% of patients with high family history of migraines, compared to 70% of patients with low family history. Moreover, research was conducted on rats, indicating that the activation of the trigeminovascular system by PACAP38 contributes to the pathogenesis of migraines. In other studies, also involving rats, PACAP38 showed to may induce the activation of MrgB3 receptors, which can contribute to its pro-nociceptive effects by causing the release of meningeal mast cells. The human counterparts to the MrgB3 receptor are MRGX2 and MrgB2. Phase I and II clinical trials have reported no significant adverse effects related to PACAP therapies.The activation of PACAP-receptors initiates intracellular signal transduction through G-protein complexes, leading to various biological responses involving multiple pathways such as the adenylate-cyclase pathway and calcium ion mobilization. **Conclusions:** Antibody-based treatments targeting CGRP have emerged as a major advancement in the treatment of migraines. Similarly, targeting PACAP with antibodies is a promising avenue to explore. Researchers have suggested that blocking PACAP38 may offer a new treatment option for patients who don't respond to CGRP antagonists, making it a potentially valuable therapeutic target. However, it's important to keep in mind that these neuropeptides have separate and independent signaling pathways. Hence the conduction of additional research on the signaling pathways of PACAP38 is crucial for developing receptor-specific blockers that effectively target this neuropeptide.

Keywords: Migraine, PACAP, CGRP, Drug target

RELATION BETWEEN LONG INTERSPERSED NUCLEAR ELEMENTS AND SCHIZOPHRENIA: A LITERATURE REVIEW

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Background: Background: Retrotransposons are a class of transposable DNA sequences. They have different subgroups, and LINE-1 (Long interspersed nuclear elements-1) are the only transposons with autonomous retrotransposition activity. LINEs transposition is shown to be involved in many diseases like cancers, autoimmune diseases, and mental disorders. Schizophrenia is a serious mental disease with a prevalence of up to 0,64% and an increased risk of premature death. Today the causes and processes of this devastating disease are not fully understood yet.Objective: The current review aims to elaborate on the possible connection between LINE-1, activated Interferon-related (INF) genes and schizophrenia and whether a target for psychopharmaceuticals exists. **Material and methods:** We searched the online database"PubMed" using the MESH terms "long

interspersed nuclear elements-1" OR "LINE-1" OR "Retrotransposons" AND "schizophrenia" AND "Interferon-related genes" for open-access research articles between 2004-2022. We filtered them and tried to mark out the most important findings of these fiveterms. **Results:** LINEs are significantly increased in human brains with schizophrenia. Disturbance of early neural development showed increased LINE-1 content, and patients with important genetic factors for the development of schizophrenia had increased LINE-1. The methylation level of LINE-1 in patients with this disease was decreased. LINE-1 insertions were on genes associated with mental disorders, and they reduced gene expression there. But current antipsychotic drugs do not influence the LINE-1 copy number in the brain. LINE-1retrotransposon activity can increase the expression of the IFN-ßgene. On the other hand, the IFN-ß gene was shown to suppress LINE-1 spreading. Generally, IFN genes are thought to protect against LINE-1 retrotransposition activation. Therefore, theeffect of LINE-1 reverse transcriptase inhibitors could support the effect of IFN genes against the LINE-1 retrotransposition. **Conclusions:** Although not all processes of LINE-1 and schizophrenia are fully understood, the possible effect of IFN/LINE-1 reverse transcriptase inhibitors should be considered. Studies showed that inhibitors of LINE-1 reverse transcriptase lower the levels of LINEs retrotransposition. Therefore, future study goals could be that pharmaceuticals target the LINEs, and the effects of IFN/LINE-1 reverse transcriptase inhibitors should be investigated in patients with schizophrenia.

Keywords: Long interspersed nuclear elements-1, Retrotransposons, Schizophrenia, Interferon-related genes

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C-REACTIVE PROTEIN IN SCHIZOPHRENIA ASSOCIATED NEUROINFLAMMATION

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Background: The pathophysiology of schizophrenia with its associated anxiety disorders involves the neurotransmitters serotonin, noradrenaline, and gamma aminobutyric acid. Growing evidence shows that the functions of these neurotransmitters are at least partly regulated by inflammatory mechanisms, neuroinflammation playing an important role in the pathological consequences of schizophrenia. C-reactive protein (CRP), a pentameric molecule, is the most widely used marker of inflammation, and is increased in the serum of patients with various types of neuropsychological conditions including general anxiety disorder, schizophrenia, depression, post-traumatic stress disorder (PTSD), and even dementia. In inflammatory conditions, CRP dissociates irreversibly into monomeric CRP (mCRP), which displays strong pro-inflammatory effects, primarily through stimulation of M1 macrophage polarization, endothelial cell activation, and their tissue-associated secretion of pro-inflammatory cytokines, including interleukin-8, interleukin-1 beta, and monocyte chemoattractant protein-1.
Objective: The aim of this study is to examine associations between CRP and schizophrenia. Furthermore, the role of mCRP in development of neurodegeneration and dementia has been evaluated. **Material and methods:** A detailed literature search was conducted to systematically assess the relationship between CRP, neuro-inflammation and schizophrenia; in addition, pilot data from in vivo models has been described, providing evidence for the pathological role of mCRP in the course of this illness. **Results:** A recent study focused on the cognitive effects of mCRP, showed increased anxiety in mCRP-treated mice in the light/dark box test and open field test, concomitant with an increase in inflammatory cytokine tissue expression. Administration of the blocking anti-mCRP antibody 8C10, directly into the mouse hippocampus, was able to reverse the anxious behavior. A study utilising the prepulse inhibition test of the startle reflex, at an auditory stimulus of 84 dB, demonstrated that mCRP induced a deficit in sensorimotor gating. Such a deficit is characteristic for schizophrenia, but is also found in other psychiatric disorders, including depression and anxiety. **Conclusions:** This data describes a potentially significant anxiety-inducing effect of CRP, and specifically, the possibility that mCRP may have a major contribution to the anxiolytic effects. mCRP-specific antibodies or other small molecule inhibitors may contribute towards future therapies. Inflammation is involved in the pathophysiology of schizophrenia, and preliminary results point to an involvement of CRP, and particularly, mCRP in production of this pathological micro-environment. Plasma mCRP measurement could become a critical diagnostic tool in management and stratified treatment of mental disorders, moreover, protecting against later development of dementia.

Keywords: C-reactive protein, schizophrenia, neuroinflamation, neurodegeneration, dementia

C-REACTIVE PROTEIN ASSOCIATED INFLAMMATION IN DIABETIC WOUND HEALING AND ITS POSSIBLE CONTRIBUTION TO NEURODEGENERATION

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Background: C-reactive protein (CRP) is an important, non-specific acute phase reactant. Its native homopentameric form (nCRP) can bind to the cell membrane and then irreversibly dissociate into free monomers (mCRP), with a significantly higher proinflammatory activity. mCRP may play an important role in increasing and perpetuating inflammation, impairing angiogenesis, tissue repair and regeneration. Through these mechanisms, it can be involved in the pathophysiology of several diseases, such as non-healing diabetic wounds and ulcers, where a lack of resolution can be caused by uncontrolled inflammation, excessive immune activation, and M1 macrophage polarization. Chronic, diabetes-induced systemic inflammation is associated with increased risk of dementia, therefore here, a potential correlation between complex diabetic lesions and neurodegeneration is discussed. **Objective** : This study aims to investigate the association between mCRP and diabetic wound healing, and the related pathobiological signal transduction activation. Specifically, the mechanism through which mCRP-induced inflammation in diabetes abrogates normal recovery and contributes to novel neurodegenerative signatures. **Material and methods:** A comprehensive literature search in PubMed was performed to investigate any correlation between inflammation mediated by mCRP and improper diabetic wound healing. Furthermore, an additional search was carried out to identify publications associating these two parameters (mCRP and diabetes) with neuropathological damage and risk of dementia. **Results:** Studies and reviews showed the existence of a relationship between mCRP and impaired diabetic wound healing. mCRP activates endothelial cells leading to release of Monocyte Chemoattractant Protein-1, interleukin 6 and 8. Moreover, mCRP increased the number of receptors for advanced glycation end-products (RAGE) and phosphorylated the insulin receptor substrate-1. A recent study demonstrated that blocking the effects of RAGE, with antibodies, improved wound healing in diabetic pigs. Important immunomodulating effects identified in this study, mediated by mCRP, include macrophage M1 polarization, increased reactive oxygen species, and complement C1q fixation, which creates an pro-inflammatory immune microenvironment. The impact of this is a critically harmful delay in the capability of the diabetic wound to heal. A study conducted on diabetic patients with mild cognitive impairment (MCI) reported that higher expression of RAGE and CRP increased notably the probability of developing MCI in elderly patients with type 2 diabetes. **Conclusions:** This evidence reveals a potentially major role of CRP, and especially mCRP, in aberrant diabetic wound healing, through its numerous pro-inflammatory and vascular effects. The modulation of these pathways could represent a future therapeutic target to improve the healing of diabetic wounds. In this way, the decrease of systemic inflammation is also of significant potential benefit to prevent MCI and possible dementia in elderly patients with type 2 diabetes.

Keywords: monomeric C-reactive protein, inflammation, macrophage polarization, diabetic wounds, neurodegeneration

MORPHOLOGICAL THYROID DISORDERS IN PATIENTS WITH ACROMEGALY

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Background: Acromegaly is a rare clinical condition resulting from excessive Growth-Hormone (GH) secretion, respectively Insulin Growth Factor 1 (IGF-1), caused most frequently by an adenoma of the pituitary gland. These hormones in excess can have effects throughout the entire body and lead to a variety of comorbidities over time, one of them being morphological and functional thyroid pathologies. Thyroid disorders such as goiter and thyroid nodular disease are not uncommon in these patients, which could be caused by the exposure to chronic high IGF-1 levels characteristical for patients with uncontrolled acromegaly.The aim of this paper was to study the correlations between acromegaly and thyroid disorders, focusing on the possible GH-IGF-1 axis biochemical parameters influencing the development of the thyroid disorders. **Material and methods:** 39 patients with confirmed acromegaly who are under the active surveillance and/ or treatment by the Endocrinological Department of Târgu Mures and a few Acromegaly patients from another Romanian Endocrinological Center were included in this study. Medical charts and papers from the hospital database were retrospectively reviewed and analyzed. **Results:** 82% of the patients included suffer from a thyroid disorder with about 74% of patients having thyroid nodular disease and 59% goiter. A moderate positive correlation between disease duration, on average 11,6 years since Acromegaly diagnosis, and total thyroid volume, on average 28ml, was shown to be statistically significant (p=0,007). Thyroid disorders and IGF-1 at diagnosis were also found to be statistically significantly correlated with an Eta-coefficient of 0,607. **Conclusions:** Despite being a small sample, a high prevalence of thyroid disorders such as thyroid nodular disease and goiter were observed in our patient group. In particular morphological alterations of the thyroid gland could be demonstrated in multiple individuals, therefore emphasizing the need for a regular monitoring of the thyroid gland through clinical exam and/or ultrasound, hormonal tests. Further studies with larger samples are needed in order to determine the prevalences of these thyroid disorders and to establish the parameters mostly influencing their development. By understanding the factors influencing the development of thyroid disorders in patients with acromegaly, more superior screening protocols and even prevention strategies could be implemented in the future for this patients group.

Keywords: Acromegaly, Thyroid Gland, Thyroid Nodular Disease, Pituitary Gland, Goiter

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HOW IS THE RELATIONSHIP AND KNOWLEDGE OF THE POPULATION TO FIRST AID?

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Background: For anybody generally but especially for medical professionals, first aid knowledge is an essential skill for saving lives, which should be assumed by everyone. First aid describes the first measures that people can take before emergency services arrive. In this way, a real difference between survival and non-survival can be made. Objective: The study deals with the analysis of the relation and knowledge of the population to first aid. It is researched whether people are open to provide first aid or if they are rather afraid of getting into such a situation. As well whether everyone knows what to do in emergencies and who to contact. This provides a basic overview of the current status of knowledge regarding first aid. **Material and methods:** The data collection was carried out by a self-administered structured online questionnaire. **Results:** The data collection is still ongoing; therefore, the results are preliminary, until now having only 206 responders. The survey showed that more than half of the participants (55%) would try to provide first aid, depending on what they remember. 20% of them prefer leaving that to others, and the other 25% exactly know what to do in an emergency. Some women and men completed their last course up to more than 40 years ago, but mostly the last took place 3-5 years ago. Nearly all answerers (98%) are willing to provide first aid to a stranger. A percentage of 46 aren't afraid of doing something wrong when providing first aid. Another 41% of responders feel like they don't know enough about the implementation or are afraid of doing more damage than gain (13%). More than half of responders (55%) know for sure what to do in a cardiac arrest, while 36% are not really sure and 9% don't know what to do. The general measure of check, call, push, when finding an unconscious person seems to be clear for 85% of participants, but not for the remaining 15%. **Conclusions:** The will to provide appropriate lifesaving measures exists but is partially prevented from being carried out due to lack of knowledge, uncertainty and the fear of causing more damage to the victim through one's

own action. Unfortunately, there are individuals who have no idea what to do in an emergency. The majority of responders know how to deal with cardiac arrest and the general process of finding a person, checking, calling emergency services and starting CPR if necessary. There are still major gaps in knowledge that, out of respect for life, should definitely be refreshed.

Keywords: First aid, Emergency situation, Knowledge, Cardiac arrest

RIGHT VENTRICULAR VOLUME MEASUREMENTS – COMPARISON STUDY OF CT AND MRI

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Background: The assessment of the right ventricle (RV) remains challenging in a clinical setting. Evaluation of the cardiac chambers is important to diagnose and guide treatment of several cardiac and pulmonary diseases. The gold standard for analyzing the RV volumes is a cardiac MRI. As the RV is difficult to assess due to its complex shape, echocardiographs are of limited use to calculate the RV volume properly.As cardiac MRI has a limited availability, the patients get analyzed by using a cardiac CT scan, which is more widely available, cheaper, and faster. **Material and methods:** A retrospective study was performed by measuring the volumes of the RV in CTs and MRIs of 23 patients who underwent both those investigations within a maximum of 40 months between the examinations. The patients were examined between January 2017 and July 2022.The following parameters were recorded for each patient: the date of the CT and MRI examinations, the months between both examinations, age, gender, weight, height, BSA, and the patient's ID. Statistical analysis was performed with Microsoft Excel 2020 and the online accessible software Graphpad by Domatics. The significance level was set to 0.05. The correlation tests after "Spearman" the results are interpreted as follows: perfect correlation p=1.0; both values increase/decrease together p=0-1; both values do not vary together p=0.0; one value increases while the other one decreases or vice versa p=-1-0; negative or inverse correlation of the values p=-1.0. **Results:** The age of the 23 patients ranged from 8 years to 63 years, with a median age of 16 years. The height of the patients ranged from 31 kg to 145 kg, with a median weight of 75.5 kg. The heights of the patients ranged from 137 cm to 185 cm, with a median height of 170.5 cm.The volumes of the RV are separated into volumes measured on the CT scan (min: 42.06 ml; max: 295.33 ml; median: 135.4 ml) and MRI scan (min: 87.7 ml; max: 359.45 ml; median: 147.55 ml). Those RV volume measurements were set into context with the patient's age, weight, and height, and for each correlation, a correlation test after "Spearman" was calculated.The correlation between the age and RV volume measurements on MRI (p=0.52) and CT (p=0.02) was found in this study. Also, for the weight and the RV volume measurements, both values had a positive correlation (MRI: p = 0.42 and CT: p = 0.01). Lastly, the correlation between the height and the volume of the RV was found in both scans (MRI: p = 0.47; CT: p = 0.11). **Conclusions:** A strong correlation between the volumes measured by CT and MRI was identified.

Keywords: cardiac CT, cardiac MRI, RV volume measurements

RISK FACTORS FOR NEW-ONSET ATRIAL FIBRILLATION IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS SURGERY

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Background: Studies examining the occurrence of atrial fibrillation (AF) in patients undergoing coronary artery bypass grafting (CABG) show a high prevalence of new-onset AF (NOAF) in this population. Findings also reveal that the development of NOAF after CABG significantly increases the risk of heart failure and mortality. **Objective:** The subsequent study sought to determine the risk factors of post-CABG AF and its clinical significance. **Material and methods:** This retrospective case-control study used a database of patients who have undergone isolated CABG between March 2016 and June 2017 at the Emergency Institute for Cardiovascular Diseases and Transplantation Târgu Mureș, Romania. The cohort was assessed for risk factors of NOAF and its impact on in-hospital outcomes. The presence or lack of NOAF was used to categorize patients in this investigation. **Results:** The sample consisted of 30 subjects with an average age of 60 ± 9.26 years; 80 % of patients were male. Out of

the 30 patients, 11 (36.6%) developed NOAF during hospitalization. The mean age of patients with NOAF was higher than that of non-arrhythmic patients (65.0 ± 5.8 vs. 58.0 ± 10.4 years, p = 0.04). Patients with post-CABG NOAF had higher CHA_2DS_2VASc scores (RR = 1.53, 95%CI [1.00, 4.28], p = 0.03) and mean baseline heart rates (72.0 ± 16.5 vs. 64.0 ± 95, p = 0.03) when compared to patients without NAOF. New-onset kidney dysfunction (OR 6.40, 95%CI [1.16, 35.44], p = 0.02) and increased duration of hospital stay (16.27 ± 4.05 vs, 13.00 ± 3.43, p = 0.02) were found to be relevant complications of NOAF. **Conclusions:** These results suggest that advanced age, increased CHA_2DS_2VASc score, and elevated mean baseline heart rate are associated with higher risk of developing NOAF. At its turn, NOAF increases patients' likelihood of postoperative new-onset kidney dysfunction and prolongs the duration of hospital stay. The study implies that patients need to be appropriately evaluated in line with their risk factors before undergoing CABG. Further, patients that have already developed NOAF need to be evaluated in terms of the risk factors to determine the intensity of medical management. Proper management of complications in patients with NOAF is needed to obtain better patient outcomes.

Keywords: Atrial fibrillation, Coronary artery bypass surgery, New-onset atrial fibrillation

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USEFULNESS OF DIGITAL LEARNING – CAN WE BRING PHARMACOLOGICAL TEACHING TO THE NEXT LEVEL?

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Background: Pharmacology is arguably one of the most daunting subjects for medical students with its seemingly endless mechanisms of actions and drug classes. On top of that, the respective parts of pharmacology are required for all clinical subjects, meaning the student must review all of pharmacology on a frequent basis, even after the official class is passed. For teaching pharmacology, we usually rely on the "normal" teaching methods: Lectures, practical activities that approach the topics from a more practical standpoint and a pharmacological book as the official bibliography. While this approach works, more for some students and less for others, we feel that in our digital age, the teaching process can be elevated to the next level. Therefore, our objective is to create a website built from the point of view of medical students, containing various study resources to aid the teaching process and evaluate students' response to it, in an objective and subjective manner. **Material and methods:** We created a website using Wordpress that can be freely accessed by students taking pharmacology classes. The website offers the actual study material, presented in an interactive and easy-to-understand way, quizzes for the student to assess their understanding for each topic, case-based learning, a practice exam and the ability to participate in open discussions. This is available for respiratory pharmacology and will be put into practice next teaching module in the second year of general medicine. During that module students will be encouraged to use the website at their own pace in parallel with the class. To assess the usefulness of the website we will monitor the number of students signing up on the website and the responses to the quizzes and practice exam. Students will also be asked to fill out a feedback questionnaire at the end of the module. Additionally, we will compare the grades of students who used the website with those who did not. In case all students will use the website grades can be compared to those of the previous year. **Results:** The website has been successfully created with all features mentioned above under the project name "Medical Literacy" and is available at www.med-lit.com. We expect students' understanding of the topics to increase since they are reinforcing the knowledge from different angles which will potentially increase the average grade. We also expect students to be more aware of how well prepared they are and make it easier for them to focus on their weaknesses. **Conclusions:** While most areas of our modern-day life have been increasingly digitalized, teaching modalities are still one step behind. With this project we will evaluate whether a digital counterpart to our onsite teaching has a useful place in medical education.

Keywords: Digitialization, Teaching, Pharmacology

NON-HPV RELATED SQUAMOUS CELL CARCINOMA OF THE ORAL CAVITY – CASE PRESENTATION

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Background: Squamous cell carcinoma is a common cancer of the head and neck and represents the majority of malignancies of the oral cavity. It is deemed a multifactorial neoplasm, closely associated with deleterious habits like alcohol and tobacco usage as well as oncogenic strains of HPV, most commonly HPV16. They may be preceded by premalignant lesions (mainly leukoplakia and erythroplakia), however, this is not the rule (especially regarding HPV-related neoplasms). Histologically, squamous cell carcinomas are categorized into nonkeratinizing and keratinizing variants (in addition to its grade of differentiation), with the former having a close relation to HPV and typically a better prognosis than keratinizing cancers of non-HPV-associated origin. Early detection is a critical prognostic factor, allowing for surgical intervention to be the mainstay of treatment, however, this is uncommon and treatment is frequently multimodal and multidisciplinary. Evaluating p16 expression, which can be tested using immunohistochemistry, is of special interest as positivity is highly sensitive and specific for high-risk-HPV strains associated cancer which present a better prognosis.To report the clinicopathological characteristics of an oral cavity carcinoma developed in a male patient and to highlight the prognostically valuable parameters. **Material and methods:** A 47-year-old male patient was hospitalized with a malignant tumor on the floor of the mouth and the left lateral border of the tongue. Surgical excision of the tumor was performed in conjunction with a left supraomohyoid laterocervical lymph node dissection and the surgical specimens were sent for histopathologic examination. **Results:** Macroscopic examination revealed a whitish, ulcerated area of the floor of the mouth and the left lateral edge of the tongue's surface. On the cut section corresponding to the ulcerated area, tumor tissue was observed, measuring 27x15x10 mm. Histopathological analysis showed a moderately differentiated (G2) keratinizing squamous cell carcinoma infiltrative into the floor of the mouth and left lateral border of the tongue, involving also salivary gland lobules and striated muscles, with peritumoral chronic inflammation. The tumor's maximum depth of invasion (DOI) was 15 mm, corresponding to stage pT3, it presented perineural invasion (n1), without lymphovascular emboli (LV0) or lymph node metastases (pN0), and the resection margins were tumor-free (R0): Immunohistochemical expression of the p16 marker was negative. **Conclusions:** Even if the tumor was completely resected, without lymphovascular invasions or lymph node metastases, the presence of perineural invasions and the lack of immunohistochemical p16 expression indicate a worse prognosis, the reason why together with oncotherapy, close monitoring and follow-up represent a necessity.

Keywords: squamous cell carcinoma, oral cancer, floor of the mouth, HPV

TREATING PRENATAL DEPRESSION - WHAT HAPPENS TO MOTHER AND CHILD?

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Background: Depression is a worldwide leading cause of disability, with an increased prevalence in women. Pregnancy involves a series of physiological, psychological, and hormonal changes, representing the highest risk period for developing mood disorders. Whilst there are numerous studies concerning post-natal depression, prenatal depression remains dangerously underdiagnosed and consequently, undertreated. Overlooking depression is detrimental not only for the women's overall health, but also for the developing foetus. While screening for and recognizing prenatal depression is important, treating it is essential. Pharmacological treatment during pregnancy might be associated with a series of adverse effects and should be carefully considered. In Romania, a comprehensive survey on pharmacotherapy for pregnant women with depression has not yet been carried out. **Material and methods:** We designed a prospective, cross-sectional, non-interventional pharmacoepidemiologic study aimed to assess the prevalence of prenatal depression in the County Hospital of Targu Mures, along with the characteristics of the pharmacological treatment during pregnancy and its effects on the new-born. A tangential point of interest is assessing the patients' attitude towards the treatment and its impact

on the postpartum state. In order to carry out the study, we will organise personal interviews through which data will be collected using checklist type questionnaires previously prepared. The data will be collected anonymously, and only non-personal information will be documented. Statistical analysis will be performed using the Excel 2010 Statistical Package, Epi Info Statistical Software and GraphPad Prism 7 Statistical Software. Following these steps, a comprehensive report of the study will be compiled. **Results:** Evaluation and hypothesis testing will be performed after the statistical analysis. The evaluation will include analysis of the pharmacological regimens used in clinical practice, their effectiveness and safety compared to the current guidelines. We expect to be able to identify possible weak links in the treatment process. The implementation of the study presents an opportunity and possible necessity to strengthen the collaboration between clinical pharmacology, obstetrics-gynaecology, and neonatology departments. **Conclusions:** With a gradual increase in prevalence over the last 10 years, prenatal depression presents itself with risks and uncertainty regarding its treatment. There is insufficient data to support and inform which antidepressants should be selected for patients that require pharmacological treatment. Appropriate research is urgently needed to establish the risk-benefit ratio of depression treatment during pregnancy to come one step closer to shape proper guidelines.

Keywords: Pregnancy, Prenatal depression, Antidepressants

SHOULD IMMEDIATE RESUSCITATIVE THORACOTOMY BE THE STANDARD OF CARE IN TRAUMATIC CARDIAC ARREST? LITERATURE REVIEW.

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Background: Traumatic cardiac arrest presents the direst situation in trauma care and emergency medicine in general. Depending on the mechanism and type of injury survival rates are abysmally low and treatment of the cause represents the ultimate time-critical issue. This article examines the need for immediate resuscitative thoracotomy performed at the place of occurrence to increase the odds of survival.This article aims to show that, at the moment traumatic cardiac arrest is determined, immediate resuscitative thoracotomy should be the standard of care instead of intermediate non-surgical resuscitation or as an ultima-ratio. **Material and methods:** Congregating the most reliable information, an overview of literature data was conducted on PLos and PubMed using keywords like "survival rates in traumatic cardiac arrest", "survival rates of resuscitative thoracotomy" or "traumatic cardiac arrest". **Results:** Current evidence shows that survival rates in traumatic cardiac arrests treated with the different types of resuscitative thoracotomy: Antero-lateral, mid-line sternotomy and clamshell thoracotomy dramatically increase survival rates, For traumatic cardiac arrests 30-day survival rates as low as < 1% to 3.7% are documented increasing in blunt traumatic cardiac arrest to 32%, and in penetrating traumatic cardiac arrest to 72% respectively, if resuscitative thoracotomy is performed. Minor differences in complication rates and provider preference can be found corresponding to the different techniques. Further, there seems to be a positive correlation between the proximity of the determination of the arrest and the execution of the procedure. **Conclusions:** Literature data clearly presents increased odds of survival independent of the technique performed. The two biggest limitations in general appear to be a lack of confidence for non-thoracic-surgical physicians in the procedures and delayed decision-making to perform any type of resuscitative thoracotomy in a non-operating room setting. Skill training in the procedures for all emergency room personnel should be employed and clearer guidelines on the nature of the immediate necessity of the procedure should be introduced. More evidence should be generated to evaluate the effectiveness of the different techniques once the procedure and indication are standardised.

Keywords: Resuscitative thoracotomy, Traumatic cardiac arrest, Clamshell thoracotomy, Thoracic trauma

CLINICOPATHOLOGICAL ANALYSIS OF SALIVARY GLAND TUMORS (A 1-YEAR RETROSPECTIVE STUDY)

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Background: Salivary gland tumors (SGT) consist of a wide spectrum of benign and malignant neoplasms of epithelial or mesenchymal origin, lymphomas, and secondary tumors. High worldwide diversity is also present in the epidemiological data, and in most cases, the etiology remains unknown. Some proven risk factors represent exposure to radiation, hormonal changes, and different occupational exposure products. The objective of this research was to investigate the clinicopathological characteristics of SGT cases diagnosed during the course of 12 months. **Material and methods:** The histopathological reports of 27 consecutive cases diagnosed with SGT were analyzed, focusing on parameters like age, gender, tumor type, size, location, resection margins, etc. Tumors were diagnosed based on the current World Health Organization criteria. Mucoepidermoid carcinomas were also microscopically graded with the system presented by Brandwein et al. **Results:** There were 17 benign (62.96%) and 10 malignant (37.04%) SGT, most of them with epithelial origin (92.59%), with a mean age of 57.9 years (age range from 6 to 88 years). The mean age of patients with benign SGT was 53.6 years while the mean age of patients with malignant SGT was 65.1 years. Female patients predominance was observed, representing 70.37% of the cases, with a female:male ratio of 2.3:1. In these 12 months, most of the tumors occurred in the parotid gland (70.36%, n=19), followed by the minor salivary glands of the palate (18.52%, n=5), upper lips (n=1), tongue (n=1), and submandibular gland (n=1). Regarding tumor type, the majority of the benign tumors were pleomorphic adenomas (35.29%, n=6) and Warthin's tumor (35.29%, n=6), followed by basal cell adenoma (n=2), oncocytoma (n=1), cystadenoma (n=1), and intraductal papilloma (n=1), while most of the malignant tumors were mucoepidermoid carcinomas (30.00%, n=3, one - intermediate grade and two - high grade). In addition, single cases of epithelial-myoepithelial carcinoma, polymorphous low-grade adenocarcinoma, adenoid cystic carcinoma, acinar cell carcinoma, MALT lymphoma, diffuse large B cell lymphoma, and mammary analogue secretory carcinoma were diagnosed. Most of the minor SGT were malignant (83.33%), while in the major ones, 88.23% of the tumors were benign (p=0.0646). **Conclusions:** In the current study, most of the SGT were benign, developed in the parotid gland, and affected mostly female patients. Pleomorphic adenoma and Warthin's tumor were the most frequently identified benign tumors, while mucoepidermoid carcinoma represented the most common salivary gland malignant lesion. Although tumors were less frequently identified in the minor salivary glands, they were predominantly malignant, an aspect that should be taken into consideration when examining lesions in these anatomical locations

Keywords: salivary gland tumors, mucoepidermoid carcinoma, pleomorphic adenoma, warthin tumor, parotid gland

DARK CHOCOLATE AGAINST DEPRESSION

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Background: Depression is a common mental disorder. According to a statistical survey by the WHO, around 5% of the adults worldwide suffer from depression. Women are more effected by depression than men. Also, in younger ages (3-17 years) it is a common disorder, around 11% are diagnosed with depression. Depression is one of the leading disorders and a big part of the overall global burden of disease.The therapy for depression includes psychological treatments such as behavioral activation, cognitive behavioral therapy and interpersonal psychotherapy.The medical treatment for example consists of SSRIs and TCAs, these are not first line treatment for mild depression and depression in children and adolescents because of side effects.Dark chocolate lowers the risk of depression in an optimal dose of 24-48g of over 70% cocoa. The high percentage maximizes health ingredients while minimizing the calories and the sugar.The mechanisms that explain the antidepressant effects of dark chocolate are: Flavanols, they are brain-protecting nutrients and improve the mood and cognition.

Theobromines are adenosine-agonists and have a rapid effect on energy and cognition. N-acylethanolamines are fatty acids (analog to anandamide) that are endogenous cannabinoid with anxiolytic and euphoric effects. And phenylethylamines are natural monoamines that increase the release of norepinephrine, dopamine and acetylcholine. **Material and methods:** We carried out a review on the topic of dark chocolate against depression including studies from medical databases: PubMed, Ovid MEDLINE, EMBASE, Web of Science, Google Scholar, Cochrane Library during a 2-month period. Keywords used were dark chocolate, depression, prevention, health improvement, cacao, health, stress relive and pharmacotherapy. To ensure quality data presented in an article was cross checked until clear results were obtained. In the review we included articles with well-defined data and ongoing research. **Results:** We established two hypotheses: that dark chocolate has antidepressant effects on people with depression and second to evaluate if this effect be filtered out and intensified, and in this way, depression can be avoided or treated. The results obtained support our hypothesis by comparing dark chocolate and milk chocolate or no chocolate, since only dark chocolate had the antidepressant effect. The ingredients and the effects they trigger on the body, also support the hypothesis. Furthermore, dark chocolate has other positive effects like prevention of DMT2, cardiovascular, stress, glucocorticoids. Therefore, dark chocolate can be used as a short-term supplement to prevent or treat mild depression. It has also been proven that no more than 48 grams of dark chocolate per day, should be consumed, otherwise it can lead to undesirable side effects such as migraines, insomnia, kidney stones and caries. No evidence has been collected regarding studies longer than six months or filtration of the effected ingredients. **Conclusions:** Based on the data gained during this review we can conclude that research in this field is worth to be conducted. We plan to continue the current research with two next steps: a questionnaire based online and on person survey as well as experimental study for objectivization of the found results.

Keywords: Depression, Dark Chocolate, Effects, Antidepressants, Mood/Health

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ENDARTERECTOMY FOR MODERATE AND SEVERE CAROTID STENOSIS: FRIEND OR FOE?

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Background: **Introduction:** Carotid endarterectomy (CEA) is an effective treatment for patients with severe stenosis of the internal and common carotid arteries, helping to prevent transient ischemic attacks (TIAs) and strokes. However, recent advances in medical therapy have provided more options for the management and treatment of patients with asymptomatic and symptomatic carotid stenosis. **Objective:** The aim of this study is to find which treatment is more suitable for the prevention of strokes and TIAs in patients with symptomatic carotid stenosis (SCS) or asymptomatic carotid stenosis (ACS). **Material and methods:** **Materials and Methods:** This study is a retrospective literature review comparing CEA and the best medical treatment (BMT) for patients with moderate and severe carotid stenosis. According to the latest guidelines published by the European Society of Vascular Surgery and the European Stroke Organization, the indication for CEA, which was previously only used in patients with severe carotid stenosis, is now suggested to be used in patients with symptomatic (>50%) or asymptomatic (>60%) carotid stenosis instead of BMT. For this study, we analyzed the results of the most recent articles from the Pub Med library comparing the efficacy of CEA versus BMT in patients with moderate and severe carotid stenosis. **Results:** **Results:** In asymptomatic patients, the 30-day risk of stroke/death/myocardial infarction was higher after CEA compared to BMT, but the long-term risk of ipsilateral stroke was lower in asymptomatic patients who underwent CEA. Comparing CEA and BMT in asymptomatic patients, there was a significant reduction in ipsilateral and any stroke at five years after CEA. The cumulative incidence of stroke or death within 30 days after CEA or the 5-year risk of any ipsilateral stroke in asymptomatic patients was lower with CEA plus BMT compared to BMT alone.In symptomatic patients, the 30-day risk of stroke and death was less than 4% after CEA, indicating that the risk of stroke and death after surgery has decreased significantly over the past two decades. CEA reduced the five-year cumulative rate of disabling and fatal stroke and death for moderate and severe carotid stenosis in males and females, and it was beneficial compared to BMT for moderate and severe SCS. It showed no benefit in treating recurrent symptoms in patients with mild stenosis (< 50%). **Conclusions:** **Conclusions:** In asymptomatic patients, CEA effectively reduces symptoms in the long term (≥ five years) but carries TIA risks. Even with modern advances in therapy, it is unclear whether CEA has a statistically significant advantage over BMT in asymptomatic patients with moderate stenosis. In symptomatic patients, however, CEA has a greater benefit than BMT in reducing the risk of stroke and other symptoms in severe SCS and is an

acceptable intervention for moderate stenosis. Further trials are needed to compare the advantages and disadvantages of CEA and BMT in asymptomatic patients.

Keywords: Carotid endarterectomy, Carotid stenosis, Best medical therapy, Stroke

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ROLE OF MIGRAINE IN PREDICTING HYPERTENSION

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Background: Both migraine and hypertension (HTN) are common and significant health conditions that impact the quality of life of millions of individuals worldwide. Understanding the relationship between these two could have important clinical implications, as it may lead to improved prediction, prevention, and management strategies for both and potentially lead to early detection and better management of HTN, and ultimately reducing the overall burden of on public health and society. **Objectives** : Objective of this study is to examine whether individuals with a history of migraines are at a higher risk of developing HTN compared to those without such history. Additionally, this research aims to investigate the temporal relationship between migraines and onset of HTN, and to explore the potential influence of other risk factors for HTN in individuals with preexisting migraines. **Material and methods:** A cross-sectional survey was conducted at a primary care clinic in the North of Germany, involving a total of 145 participants, including both migraine and hypertensive patients. The survey collected data on demographics, history of migraines and HTN (including age of diagnosis), presence of chronic diseases, menopause status (for female participants), last recorded blood pressure, type of headache, type of migraine, frequency of migraines, and medications used for both migraines and HTN. The survey questionnaire was administered to 98 female and 47 male participants, and data was collected and analyzed to investigate the potential relationship between migraines and HTN, as well as the role of other risk factors in individuals with preexisting migraines. Collected Data were analyzed using Machine learning for statistical analysis. **Results:** Results revealed that women had a higher prevalence of migraine compared to men (92% vs 76%, p=0.0076) and were diagnosed at a younger age (average age of 21 vs 25, p=0.007). Men had a higher prevalence of HTN compared to women (31.9% vs 27%), but the difference was not statistically significant (p=0.58), and there was no significant difference in diagnosis age between genders (average age of 30 for men and 33 for women, p=0.64). Co-occurrence of migraine and HTN was more frequent in women (77%) compared to men (22%), but this difference was not statistically significant (p=0.7). Both genders were diagnosed earlier with migraine than HTN, with no significant difference in diagnosis age between the two conditions (p=1).Common symptoms characteristics of patients with migraine and HTN included visual disturbances, nausea. This study represents a sample of an ongoing study, and more research is needed to validate and expand on these findings. **Conclusions:** In conclusion, this study found that women have a higher prevalence of migraine compared to men, with a significant difference in migraine prevalence and diagnosis age between genders. However, there were no significant gender differences in hypertension prevalence or diagnosis age. The co-occurrence of migraine and hypertension was reported more frequently in women, but this difference was not statistically significant. Common symptom characteristics of patients with migraine and hypertension were identified. Further research is needed to better understand the gender-specific factors associated with migraine and HTN, and to elucidate the temporal relationship between these conditions.

Keywords: Hypertension, Migraine Headache, HTN, Prediction, High blood pressure

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THE EVOLUTION OF GROIN HERNIA MANAGEMENT – THE EXPERIENCE OF SURGICAL CLINIC NO. 1, TARGU MURES EMERGENCY COUNTY HOSPITAL

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Background: Inguinal hernias are abnormal protrusions of peritoneum through congenital or acquired abdominal wall defects involving the inguinal canal. Management is surgical by open or laparoscopic approach. Open repair techniques include the Lichtenstein procedure with mesh placement, and procedures without mesh. Laparoscopic techniques are the transabdominal preperitoneal repair (TAPP) and the total extraperitoneal repair (TEP), which

differ in the way the defect is approached. **Objective** : This clinical study examines patients diagnosed with inguinal hernias admitted to the Surgical Clinic No. 1 of the Targu Mures Emergency County Hospital between July 2013 and December 2021. The main objective is to analyse the evolution of inguinal hernia management during this time period. **Material and methods:** This study includes data from 1760 admissions with the diagnosis of inguinal hernia to the Surgical Clinic No. 1 of the Targu Mures Emergency County Hospital between July 2013 and December 2021. Analysed parameters cover epidemiological factors, information about the presented inguinal hernias, and details surrounding the operative procedure. The extracted data was documented using Microsoft Excel and analysed using Microsoft Excel and IBM SPSS Statistics version 29. **Results:** Out of the 1760 admissions, 1616 were male (91,8%), while 144 were female (8,2%). The male-to-female ratio was thus approximately 11:1. Nearly half of the admissions fall between the ages of 56 and 75 years, with 25,1% (441 admissions) being between 56 and 65 years of age and 23,3% (410 admissions) being between 66 and 75 years of age. The median age lies at 61 years. In the mentioned time period, the most frequently applied technique for inguinal hernia repair was the open approach with the incorporation of mesh (976 cases, 52,5% of all inguinal hernia repairs). In the year 2013 open approach was predominantly used for inguinal hernia repairs, with the use of mesh in 47,5% of the cases, whereas laparoscopic approach was very rarely applied (1%). The number of laparoscopic repairs increased to 11,8% in 2014 while open approaches with and without the use of mesh remained equally frequent. After 2014 open inguinal hernia repairs without the incorporation of mesh decreased steadily to 10,1% of inguinal hernia repairs in 2021 and were partially replaced by open mesh procedures during the years of 2015 to 2017 (58,6% open mesh procedures and 25% non-mesh procedures in 2017). In 2018 and 2019 laparoscopic techniques reached their peak (36,7% in 2018), thus partially replacing open techniques (46,7% open mesh procedures and 16,7% non-mesh procedures in 2018). During the COVID-19 pandemic laparoscopic techniques decreased to 22% in 2021 while open mesh procedures made up the vast majority of inguinal hernia repairs (67,9% in 2021). Hernias treated by open procedures recurred in 2%, in contrast to 0,9% after laparoscopic repairs. Most recurrences were associated with open non-mesh repairs. **Conclusions:** Over the analysed time period open mesh procedures became the main approach for inguinal hernia repairs, while the use of non-mesh procedures decreased significantly. Laparoscopic techniques increased noticeably before the COVID-19 pandemic and still constituted about one fifth of all inguinal hernia repairs in 2021.

Keywords: inguinal hernia, Lichtenstein technique, TAPP, TEP

THE PHYSIOLOGICAL CORRELATION BETWEEN CATECHOLAMINE RELEASE AND SPORT INDUCED VOMITING

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Background: Vomiting can be triggered by many etiologies and pathologies, such as bacteria, gut distention with parasympathetic and sympathetic stimulus into the vomiting center of the medulla, as well as drug induced vomiting and vertigo-induced vomiting. Emesis in sports can be induced by both short high intensity exercise as well as long-duration exercise like ultramarathons. Eating prior to high-intensity exercise is correlated with gut distention being modulated by the parasympathetic nervous system, which if interrupted by early exercise turns to sympathetic stimulation which leads to catecholamine release in the adrenal medulla, which is known as interrupted digestion. **Material and methods:** To assess the several factors that are correlated with inducing nausea and vomiting, including hyponatremia and hypohydration, all of which can cause a dropout from a race or poor performance in athletes due to "athlete-induced vomiting." **Results:** A study of 707 marathon runners concluded that nausea was highly experienced during high-intensity effort much more than during low- intensity effort. This can be physiologically explained by the strong, intense sympathetic stimulation as well as the release of catecholamines at a higher rate in short high-intensity exercise. There is a correlation between the strength of sport and the strength of catecholamine secretion, which is explained by training inducing stress on the central nervous system. **Conclusions:** This stress has a feedback loop on the adrenal medulla, and thus, higher stress causes a larger amount of catecholamines being released. High catecholamines prior to strenuous exercise decrease thirst levels, meaning thirst suppression in high-effort exercise. Such thirst suppression causes hypohydration in athletes before and during exercise due to suppression of the thirst center in the hypothalamus, which is where sodium levels are also monitored. Such high release of catecholamines, specifically adrenaline and noradrenaline, is not only effort- induced but is also induced by the hypoglycemic status of an athlete. Overall, several factors can correlate with sport-induced vomiting. Rest between a large meal and high intensity exercise is

essential for the prevention of sympathetic activation due to distention of the stomach wall causing a release of catecholamines due to activation of stretch and mechanoreceptors. A break between eating and doing sport allows parasympathetic innervation to have control and allows for the emptying of the stomach. Vagal stimulation towards the area postrema and the solitary tract nucleus is not encapsulated by the blood-brain barrier, making them susceptible to stimulation from catecholamine substances in the blood such as dopamine. Such stimulation of such nuclei can induce a vagal stimulation in the gastrointestinal tract causing vomiting as an outcome. One should train for highlevel performance and not start abruptly due to the correlation between the secretion of catecholamines and the intensity of effort produced.

Keywords: Sport induced Vomiting, Catecholamines, Autonomic Nervous System (ANS), Interrupted Digestion

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DESIGN OF 3D-PRINTED TRAINING KITS FOR THE DEVELOPMENT OF FINE MOTOR AND BASIC SURGICAL SKILLS OF MEDICAL STUDENTS

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Background: Over the last few years, rapid prototyping has become increasingly accessible due to the steady improvement of accuracy, speed, user-friendliness, and decreasing price of FDM (fused deposition modeling) 3D printers and the simplification of CAD software. Due to this progress, going from an idea to a finished, functional product has never been easier.Objectives: We aim to explore the usefulness of 3D printing for the training of fine motor skills and hand-eye coordination of medical students and getting them accustomed to surgical instruments. Therefore, we want to develop multiple modules which aim to train different fine motor skills. **Material and methods:** Using Autodesk Fusion360 we redesigned popular mini-games like tic-tac-toe or four-in-a-row so that they can be played with surgical instruments like forceps or needle holders. This aims to improve the fine motor skills and hand-eye coordination of medical students in a playful way, without overwhelming or frustrating the students. The games aim to improve one skill at a time, including positioning objects, passing objects between two surgical instruments, pronation, and passing objects through obstacles. The modules were printed using polylactic acid (PLA), using a Bambu Lab P1P FDM 3D printer. **Results:** Using the preset Bambu Studio slicer settings for PLA (infill 15%, layer height 0,2mm, print speed 200-300mm/s), a simple practice module can be 3D-printed in 15-30 minutes at a price point of less than 0,50€, while using less than 50g of plastic. Time and cost can be further reduced by printing multiple modules at a time. The printed modules proved more resilient than initially expected and can be used in the intended way. **Conclusions:** 3D printing can be a valuable tool for the training of fine-motor skills of medical students while being fast, cheap, and relatively environmentally friendly. Adjustments in clearances of the parts of the modules by simply adjusting the scaling factor allow an uncomplicated modification of the difficulty to suit beginners and more advanced trainees. Even though they cannot replace more advanced training options, like using biological material, they can help form a good foundation and flatten the learning curve.

Keywords: Surgical Skills, 3D Printing, Surgery

MORBIDITY AND MORTALITY BY SARS-COV-2 INFECTION IN PATIENTS WITH HEMATOLOGICAL DISEASES

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Background: Hematological patients are immunocompromised not only due to their hematological diseases but also due to intense therapy regimes, including chemotherapy, radiation, or hematopoietic stem cell transplantation. In these patients, respiratory viruses pose a risk of severe pneumonia and are identified to increase morbidity and mortality. **Objectives:** The study aims to describe the morbidity and mortality in patients with hematological malignancies and non-oncological hematological diseases regarding their vaccination status and course of SARS-CoV-2 infection during the COVID-19 pandemic. **Material and methods:** A retrospective descriptive cohort study was conducted from March 2020 until March 2023 at the Hematology Department, Clinical County Emergency Hospital Târgu Mureș in Romania using a questionnaire and data provided by the hospital documentation. The data on 110 patients with different hematological diagnoses were collected. **Results:** Of the 110 patients, 45.5%

were male, and 54.5% were female. The most prevalent diagnosis was lymphoma (26.4%), followed by plasma cell dyscrasia (19.1%), myeloproliferative neoplasms (13.6%), acute leukemia (10.0%), chronic leukemia (9.1%), immune thrombocytopenia (9.1%), myelodysplastic syndrome (7.3%), and other non-oncological, not further specified hematological diseases (5.5%). 43.6% of patients were vaccinated, whereas 56.4% did not receive a vaccination. The most commonly received vaccination was provided by Pfizer (85.4%), followed by Johnson&Johnson (10.4%), Moderna (2.1%), and Astra-Zeneca (2.1%). Of the vaccinated patients, 62.5% were fully vaccinated, 33.3% were boostered, and 4.2% were partially vaccinated. Most patients (64.6%) receiving vaccination did not experience any side effects. The most commonly encountered side effect after vaccination was represented by local pain at the injection site (21.0%), followed by fever (6.3%), fatigue (6.3%), and lastly, allergic reaction with (2.1%). Out of the 110 patients, 45.5% contracted a COVID-19 infection. Of those infected, 56.0% had a mild infection, 24.0% presented with a moderate form, and 20.0% experienced a severe disease. Overall, 6.7% of the patients infected by COVID-19 died due to complications related to the infection. An analysis of the course of SARS-CoV-2 infection regarding the vaccination status of the patients is pending. **Conclusions:** In this retrospective descriptive cohort study, the vaccination status and course of SARS-CoV-2 infection in patients with various hematological diseases were studied. The cohort includes an even distribution of male and female patients suffering from the most common hematological diagnoses. Around half of the patients in the cohort received at least one vaccination, the most prevalent being Comirnaty by Pfizer. Severe side effects of vaccination were rare. Also, approximately half of the studied cohort contracted a SARS-CoV-2 infection with different courses. However, in most cases, with mild to moderate form of the disease. Further analysis of the course of SARS-CoV-2 infection regarding the vaccination status will allow for assessing the protection of severe SARS-CoV-2 infection in hematological patients.

Keywords: Hematology, COVID-19, Vaccination, Course of SARS-CoV-2 infection

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EVALUATION OF KNOWLEDGE AND EXPERIENCE RELATED TO SMOKING IN MEDICAL STUDENTS COMPARED TO ADOLESCENTS AND YOUNG ADULTS FROM GERMANY.

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Background: According to a research by the Federal Statistical Office (Destatis) in 2021, the prevalence of smoking was 23% in the German population. Even though the number was decreasing in Germany, there are always alternative tobacco products that are becoming more and more popular, such as shishas and e-cigarettes.Objective: The study compares German medical students with other German adolescents and young people regarding their personal experience and knowledge related to smoking. **Material and methods:** 204 German participants were enrolled in this study, 74 were medical students, 63 attended high school and the rest were young people from Germany. Prerequisites for participating in this study were permanent residency in Germany, age requirement from 16 to 30 years old- The questionnaire was distributed on-site to the medical students at the GEPUMPhST Targu Mures and online to other participants.Graphpad Prism 9 software was used for statistical processing the data. **Results:** In this study, independent of the type of tobacco product used, 15% of medical students, 11% of high school students, and 16% of young adults reported regularly using tobacco or e-cigarettes, the difference between these subgroups was not significant. Statistical significance was also not evident when participants' ages were compared between those under 22 (6% smokers) and those over 22 (17% smokers) ($p= 0.8871$). 61% of the participants aged 23 and older claimed to have smoked or vaped at least once in their lives, with 55% of them using cigarettes as their first tobacco product. 66% of all participants below the age of 23 had ever smoked, and 20% of them smoked cigarettes at their first time,the difference is not significant compared to the older participants ($p=0.0749$). There was no statistically significant difference between medical students and young adults who quit smoking ($p=0.9789$).All participants had the same level of knowledge regarding the dangers of smoking and passive smoking (100%). However, 63% of medical students claimed that shisha smoking was more dangerous than tobacco smoke, while only 35% of all the other participants claimed this ($p< 0.001$). Responses from high school students were highly variable, with 25% saying that active shisha smoking was more dangerous, the difference is significant compared to medical students ($p< 0.001$). 35% of the medical students responded that e-cigarettes were less harmful than cigarettes, compared to 26% of the other participants ($p=0.8207$). **Conclusions:** Medical students' individual experiences were typically not statistically different from those of the other participants. Results revealed that neither age difference, nor higher education had a discernible impact on respondents' answers to the aforementioned questions. Non-medical participants had little exposure to

the risks of shisha smoke, though. All participants' opinions about e-cigarettes were very dispersed. Significantly higher percentage of medical students were aware of the real impact of alternative tobacco products compared to other participants. As a result of the increasing popularity of shishas and e-cigarettes, educational institutions like schools and colleges must inform the public about these products and their risks.

Keywords: Smoking, Alternative tobacco products, Questionnaire, Young German adults

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USE OF 3D DATABASES AND 3D-PRINTING FOR THE TRAINING OF MEDICAL STUDENTS IN THEORY AND IN PRACTICE

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Background: Anatomically correct 3D models of bones, organs, and other parts of the human body are readily available online. One of the biggest databases is BodyParts3D, belonging to the Japanese life science databank, containing more than 10.000 different 3D models. The models have been published under CC BY-SA 2.1 JP, which allows users to use, share, and adapt the data freely under the terms of proper attribution and ShareAlike. Objective:Use of 3D models for the practical training of medical students, by generating 3D-printable objects from them. In this case a right femur for use in a basic orthopedic surgery skills workshop. **Material and methods:** After downloading the initial file and importing it in Autodesk Fusion 360, it needs to be transformed from a mesh to a solid body to allow modifications. Due to the dimensions of the femur, it is necessary to slice the solid body into three to five segments. Cutting the object into five segments decreases the required amount of support material and reduces the risk of warping. Having more pieces also allows us to vary the percentage of infill and the infill pattern between each segment. This helps to save material in areas that only have a cosmetic function while increasing the strength of the part in functional areas (cut, insertion of screws/nails). The segments are joined by printed M12 threaded rods. For maximal stability, the material must be deposited parallel to the long axis of the rod. The used printer is a Bambu Lab P1P, using the default settings for polylactic acid (PLA), 15-30% infill, and the Bambu Studio slicer. **Results:** Using the mentioned settings, the print took 3h10min, consuming 99.36g of filament, and thereby costing about 2,50€. The resulting part fulfills the expectations regarding stability and can be easily processed. The remaining intact parts can be recycled and added to newly printed segments, to save resources and time in the future. **Conclusions:** 3D printed parts can be used in multiple ways, as three-dimensional specimens of anatomical structures but also for hands-on surgical workshops. In both functions, they have the benefit that they can be produced locally, cost efficiently, and rapidly. Especially for more complex anatomical structures like within the brain, there is great potential that 3D printing can help to facilitate better understanding.

Keywords: 3D Printing, Anatomy, Surgery

BEAR ATTACKS – MEDICO-LEGAL ASPECTS

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Background: INTRODUCTION: Humans who venture outer into the wild are liable for wild animal attacks. Brown bear attacks are readily identified by the type of injury. Cutting and tearing with sharp teeth and claws leads to a specific pattern of severe and often fatal injuries. This illustrates the injuries caused by brown bear. The first case is about a man who survived the attack, whereas the second resulted in the death of the victim. Both incidents are from Mures County-Romania. **Material and methods: CASE REPORT:** First case: Man presented with multiple wounds caused by bites and blows with a bear's paw, an upper eyelid wound, sparse eyebrow arch, and palpebral reconstruction with the Cutler-Beard method (phase I/phase II). Surgery recommended for upper eyelid cicatricial entropion and lower eyelid ectropion. Second case: 61-year-old male was found dead on the shore of soybean field, with multiple wounds on the head and body. Victim died from violent attack. Polytrauma, including fractures and multiple torn, avulsed wounds, resulted in traumatic and hemorrhagic shock, which caused death. The injuries were likely caused by tearing, compression between sharp edges (possibly from an animal bite), and compression between hard planes (perhaps from an animal attack, potentially from bear). There is direct and unconditional

causality between the traumatic injuries suffered and death. **Results: DISCUSSIONS:** During autopsies, forensic doctors must be able to identify distinct bear attack injury patterns. Brown bears can cause severe and noticeable wounds with their sharp teeth and claws. Additionally, tissue cutting, ripping, and avulsion injuries are common. Identifying these injury patterns during the autopsy is vital for determining the cause and manner of death moreover having implications for liability. Jagged edges, punctures, and crush injuries may distinguish bear bite marks. Claw markings, which can be seen as linear or curved lacerations of different depths, may also be noticeable. Further evidence for a bear attack may result in traumatic and hemorrhagic shock caused by polytrauma with several ripped muscles, avulsed wounds, and fractures. Injuries from bear attacks can be differentiated from those caused by other animals or blunt force trauma using these results. It is important to remember that detecting bear-related injuries during autopsy can also have legal consequences because it can assist in establishing the facts of the assault and establishing who is responsible. In order to support accurate forensic investigations and legal actions, forensic doctors should be educated about specific injury patterns linked to bear attacks. They should also thoroughly document their results. **Conclusions:** Bear attacks in particular could be extremely dangerous and even fatal; hence it's crucial to know this. It is necessary to take adequate measures, such as carrying bear spray and always being aware of your surroundings. This is if you intend to spend time in places where bears are prevalent. Based on bear physical characteristics, injuries brought on by bear attacks are distinct from those brought on by attacks by other animals. To identify the attacking animal, it is crucial to comprehend the injury patterns linked to fatal bear attacks.

Keywords: Bear attacks, Brown bear, Forensic Medicine, Autopsy

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THE OUTCOME OF ANTI-VEGF TREATMENT IN AGE-RELATED MACULAR DEGENERATION

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Background: Age-related macular degeneration is a disease of the retina and remains a common cause of visual impairment leading to clinically significant vision loss in the elderly population older than 60 years old. The neovascular form of age-related macular degeneration is especially responsible for the most severe vision loss associated with the disease by causing a more rapid deterioration of visual function. Intravitreal injections of anti-VEGF drugs inhibit neovascularization and prevent further vision loss and are now considered to be one of the most effective strategy for the treatment of neovasularization. Objectives: This study aims to evaluate the outcome of anti-VEGF injection in patients with age-related macular degeneration represented by different macular optical coherence parameters that are obtained before and after treatment for interpretation of results. **Material and methods:** This study is a descriptive, retrospective study in which data of 37 patients, clinically diagnosed with a neovascular form of age-related macular degeneration were used. The data was obtained from patient files from the Ophthalmology department Târgu Mureș. By using analysis reports made by ZEISS CIRRUS™ HD-OCT, parameters of macular thickness and horizontal B-scans were obtained and analyzed. Patients were chosen between the period of January 2020 and December 2022. **Results:** Out of 37 patients, 22 (59.46 %) were female and 15 (40.54%) were male, making a male-to-female ratio of 1:1.5. The mean age of the participants was 76.7 years old, with the eldest patient being 91 years old and the youngest 53 years old. Taking into consideration the central retinal thickness parameter from the OCT analysis reports, it showed an improvement in central thickness of the retina in 75.66 % of the patients whereas in 13.16 % of the patients, no improvement was seen, and central thickness continued to increase further. The B scan visualized an improvement of retinal edema in concordance with the improvement in central thickness after treatment, meaning that in 75.66 % of the patients, the retinal edema noticeably decreased on B-scan mode visualization. Furthermore, in two patients (5.4 %) the central retinal thickness showed no significant difference after treatment. In three patients (8.10 %) only one eye improved in central thickness but the second eye, which also was affected, didn't improve with the same number of treatments. On follow-ups, after anti-VEGF treatment, no patient complained about complications related to the anti-VEGF treatment itself. **Conclusions:** Intravitreal injection of anti-VEGF produces favorable changes in optical coherence tomography parameters by reducing the retina's central thickness, which indicates improvement of retinal edema and shows no complication after treatment. This underlines the positive outcome of anti-VEGF treatment in exudative age-related macular degeneration and demonstrates its favorable side effect profile within the studied patient group.

Keywords: Age-related macular degeneration, AMD, ARMD, OCT, anti-VEGF

CHALLENGES IN NEONATAL CARE: A CASE REPORT OF A PREMATURE NEWBORN WITH VERY LOW BIRTH WEIGHT, RESPIRATORY DISTRESS SYNDROME, MULTIPLE INFECTIONS, AND SURGICAL INTERVENTION

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Background: **Introduction:** Premature birth represents significant challenges in neonatal care, with potential complications such as respiratory distress syndrome, infections, and surgical interventions. We present a case of a premature newborn delivered at 26 weeks gestation with a very low birth weight VLBW of 1000g, and due to respiratory distress syndrome, required resuscitation at the newborn intensive care unit (NICU). **Material and methods:** **Case report:** Premature newborn, 26 weeks gestation, vaginal delivery with VLBW1000g, APGAR score 6/1min, 7/5min. Mother 40 years old, blood type AII, Rh+ve, GII PII, had ruptured membrane approximately 2 hours before birth, with one dose of antepartum corticosteroids administered. Initial therapeutic measures included thermal comfort, non-invasive ventilatory support, umbilical venous catheterization, respiratory center stimulation, surfactant administration, and enteral/ parenteral nutrition. Mother with a rich culture of E. coli from the cervix, positive gastric aspirate with E.coli, antibiotic therapy Ampiplus (10 days) and Gentamicin (7 days) were initiated intravenously. However, From the 8th day of life, the patient's condition deteriorated with generalized edema, episodes of desaturation and apnea, and bilious residual gastric content. In lab findings, acute phase reactants increased. Dopamine, intubation, and mechanical ventilation were required. Antibiotics were changed to Meronem and Colistin. The patient's condition continued to worsen, and ulceronecrotic enterocolitis was suspected based on clinical signs and abdominal X-ray findings. On day 17th of life, the patient underwent surgical intervention with partial resection of the ileum and installation of ileostomy. The patient's skin condition improved, and erythrodermic skin resolved gradually. After a period of observation and supportive care, the patient was discharged from NICU on day 49th of life with appropriate follow-up arrangements. **Results:** **Discussion:** Care for premature newborns in the NICU is complex and challenging. A premature infant's underdeveloped organs and the immature immune system put him at risk for respiratory distress syndrome, infections, and other complications. In this case, the patient's clinical course was complicated by respiratory distress, suspected infection, and the need for surgical intervention with ileostomy placement. Management of respiratory distress in premature infants typically involves thermal comfort, non-invasive ventilatory support, and surfactant administration to improve lung function. The use of antepartum corticosteroids in the mother can also help fetal lung maturation. Despite these measures, the Patient experienced multiple episodes of desaturation and metabolic acidosis, suggesting possible infection. Early initiation of antibiotic therapy is crucial in suspected infection cases, as delayed treatment can result in serious complications. In this case, antibiotic therapy with Ampiplus and Gentamicin was initiated. However, the patient's condition continued to deteriorate, necessitating a change in antibiotic therapy to Meronem and Colistin. Necrotizing enterocolitis is a serious gastrointestinal disorder that affects premature newborns and is characterized by intestinal inflammation and necrosis. **Conclusions:** The patient's clinical course involved a challenging period of hospitalization in the NICU due to prematurity, respiratory distress, ileostomy placement, and suspected infection. The patient gradually improved with appropriate medical care, including respiratory support, nutrition, antibiotics, and supportive care. The hospital discharged him with appropriate follow-up arrangements. A patient's continued development and well-being must be monitored and treated appropriately.

Keywords: Respiratory distress syndrome, Very low birth weight (VLBW), E. coli infection, Necrotizing enterocolitis

SIMILARITIES AND DIFFERENCES BETWEEN SARS-COV-2 AND INFLUENZA INFECTION IN CHILDREN

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Background: The coronavirus disease 2019 (COVID-19) pandemic has caused immense global burden, causing disease mainly in the elderly. Children generally present asymptomatic or with mild infections. This is a vastly different pattern in comparison to other respiratory viruses like Influenza, which is known to cause severe disease in the young. **Material and methods:** The database of the hospital was searched for pediatric patients hospitalized in the Pediatrics I clinic during January 2022 and January 2023 with confirmed Influenza or SARS-CoV-2 infection. Exclusion criteria were previously known chronic diseases, which lead to the exclusion of seven patients. One patient was excluded due to having a SARS-CoV-2 and Influenza co-infection. The final number of patients studied was 25, 15 patients with diagnosed COVID-19 and 10 patients with influenza. For all patients the data was collected from the electronic patient files. Analyzed and compared were gender, age, duration of hospital stay, symptoms, complications, and laboratory data. **Results:** In the COVID-19 group 80% of patients were male, whereas in the influenza group 60% were female. The mean age was 19.53 months for COVID-19 and 16.6 months for influenza infection, the mean duration of hospital stay was 3.6 (range: 1-7) days for COVID-19 and 3 (range: 2-7) days for influenza. Cough, nasal obstruction, rhinorrhea, fever, pharyngitis, abnormal auscultation findings and tachycardia were more common in influenza (90%, 50%, 50%, 90%, 20%, 30%, 33.33%, respectively) compared to COVID-19 (40%, 20%, 26.67%, 60%, 53.33%, 6.67%, 26.67%, 20%, respectively). Respiratory distress, rash, oxygen saturation < 95%, diarrhea, loss of appetite and vomiting were more common in COVID-19 (26.67%, 26.67%, 30.77%, 40%, 46.67%, 46.67%) compared to influenza (20%, 0%, 10%, 0%, 40%, 40%). The only statistically significant difference was cough (p = 0.0177), more common in influenza. Complications included dehydration (53.33% in COVID-19 vs 70% in influenza), bronchiolitis (26.67% vs 10%), pneumonia (6.67% vs 0%), bronchopneumonia (0% vs 20%), acute respiratory insufficiency (20% vs 0%), anemia (60% vs 70%), febrile seizure (13.33% vs 20%), afebrile seizure (6.67% vs 0%), acute renal insufficiency (6.67% vs 0%) with no overall statistical significance. More commonly found in COVID-19 were leukocytosis (20% vs 10% in influenza), leukopenia (6.67% vs 0%), thrombocytosis (26.67% vs 0%), thrombocytopenia (6.67% vs 0%), neutrophilia (13.33% vs 10%), neutropenia (13.33% vs 0%), lymphopenia (53.33% vs 40%), monocytosis (46.67% vs 30%), eosinophilia (20% vs 0%), eosinopenia (53.33% vs 30%), basocytopenia (6.67% vs 0%), elevated transaminases (33.33% vs 0%) and increased LDH (45.45% vs 20%), whereas basophilia (6.67% vs 20%), elevated ESR (50% vs 66.67%) and CRP (23.08% vs 33.33%) were more common in influenza infection, without statistical significance. **Conclusions:** Coughing was significantly more common in influenza infection. There was no significant difference between other symptoms, complications, laboratory data, gender distribution and duration of hospital stay.

Keywords: Influenza, SARS-CoV-2, COVID-19, coronavirus

ASSESSING POTENTIAL FOR BIOLOGICAL THERAPEUTICS TO REDUCE THE RISK PROFILE OF PHARMACOTHERAPY IN MYASTHENIA GRAVIS

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Background: Myasthenia Gravis (MG) represents one of the most relevant neurological autoimmune disorders and the most frequent neuromuscular junction affecting pathology. Consequences of MG range from significant restrictions in quality of life to potentially lethal myasthenic crisis and consequently demands close medical attention. Parallel to growing incidences, the understanding and therapy of MG has substantially increased in complexity during the last two decades. Existing pharmacological approaches of cholinergic and immunosuppressive therapies have been extended by various biological agents. As most cases require lifelong symptomatic pharmacotherapy, pharmacological interactions and side effects play a major role in prognosis and

outcome of MG. Before introduction of novel therapies, treatment algorithms followed stepwise escalation schemes with increasing adverse effects. Of particular importance are the increasing immune suppression and side effect profile of corticosteroids and cytostatics. Novel therapies could potentially replace these agents and offer better prognosis and outcome by reducing pharmacological adverse effects, events, and long-term consequences. First, this research aims to conclude the pharmacotherapy of MG patients including novel therapies. Secondly, to demonstrate the relevance of pharmacotherapeutic adverse effects in MG. Thirdly, to identify the potential of novel therapies by proposing a study design for retrospective analysis of MG populations treated with escalation therapy. **Material and methods:** The determination of pharmacotherapy will be based on analysis of recent (2023) European treatment guidelines of MG. To demonstrate the relevance of pharmacotherapeutic adverse effects, a pre-published case report of an MG patient with Multiple Erythema Migrantia caused by early dissemination of Lyme Disease (LD) secondary to MG pharmacotherapy will be presented. To assess the potential of novel therapies in patient groups treated following the escalation scheme, a retrospective analysis of medical files from MG patients will be conducted. The analysis will focus on evaluating the therapy algorithms, the incidence of adverse effects and the immunological status of the patients. The potential will be measured on the incidence of adverse effects, adverse events and the individual immunological status of the patient. **Results:** Current pharmacological therapy of MG mainly includes glucocorticoids, azathioprine, methotrexate, complement inhibitors, neonatal Fc receptor modulators, CD20 antibodies, intravenous immunoglobulins, and symptomatic treatment with Acetylcholinesterase inhibitors. Many of which are used off-label. Choice of medication greatly depends on disease severity and found auto-antibodies. The patient presenting multiple erythema migrantia caused by early disseminated LD flare up ultimately due to immunosuppressive therapy for MG, perfectly represents possible detrimental effects of MG therapy. The retrospective pharmacological analysis will be executed soon with ethical approval pending. **Conclusions:** The therapy of autoimmune disorders has and will further increase in complexity due to research progress in immunomodulatory therapies. Previous approaches of general immune suppression may be replaced by more specific therapies with decreased generalized side effect profile. However, novel therapies have an important barrier with respect to economical means. Therefore, risk and benefits of the escalation therapy scheme must be precisely estimated against biological agents. Accurate identification of patient groups with the highest benefit from biological agents will be important to make biological therapies available for Myasthenia Gravis patients.

Keywords: Myasthenia Gravis, Pharmacotherapy, Biologics

GENDER DIFFERENCES IN THE STRUCTURE AND FUNCTIONALITY OF THE HEART IN PATIENTS WITH DIFFERENT FORMS OF HEART FAILURE

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Background: Heart failure is associated with the remodeling of the heart. These changes lead to heart size, geometry, and mass alterations, ultimately affecting pumping function. Not every type of HF results in the same remodeling. Depending on the type of HF, different patterns of alteration are evident. In terms of gender, there are also differences between the sexes.This study investigates the morphological and functional changes of the heart, considering gender, in different forms of heart failure. **Material and methods:** We conducted a retrospective study of 35 patients diagnosed with different types of heart failure and admitted to the Cardiology Department of the Internal Medicine II Clinic in Targu Mures. We examined data on age, gender, medication regimen, and echocardiographic measurements (RV and LV size, IVS, posterior wall, left atrial diameter, left atrial area, right ventricular area, aortic annulus, ascending aorta, pulmonary artery annulus, EF, E/A Ratio, TR velocity, TAPSE, MAPSE, ESV, EDV, ESV) in this study. General data were obtained from clinical follow-up, paraclinical, and echocardiographic records. Patient records were entered into the database, and the SPSS software program was used for statistical analysis with a 95% confidence interval and a statistically significant p-index value < 0.05. **Results:** In 35 patients (mean age 66 ± 9.68 years), with a sex ratio of 4:3 (M:F), the following parameters showed significance in morphology and functionality: In the patients with HFrEF, significance was found between males and females in the right ventricle size (males: 34.90 ± 2.90 vs. women: 31.20 ± 0.74, p= 0.019). The other parameters showed no statistical significance. Concerning the HFpEF category, the following significances were found: LV size (men: 55.6 ± 3.61 vs. women: 47.16 ± 2.85, p=0.001), left atrial diameter (men: 50 ± 11.13 vs. women: 37 ± 5.29, p=0.039), right ventricular area (men: 28. 2 ± 7.61 vs. female: 17.3 ± 4.08, p=0.013), EDV

(males: 106.20 ± 12.10 vs. female: 85.66 ± 12.78, p=0.023), SV (males: 57.6 ± 7.86 vs. female: 48 ± 4.65, p=0.032). In patients diagnosed with HFmrEF, significant values were found in the following domains: Left atrial diameter (men: 43.75 ± 2.68 vs. women: 37.75 ± 1.47, p=0.007), ejection fraction (men: 42.00 ± 3.08 vs. women: 47.00 ± 1.87, p= 0.032), E/A ratio (men: 1.37 ± 0.24 vs. women: 0.77 ± 0.20, p= 0.008). **Conclusions:** In this study, we found gender differences for each type of HF. Most statistical significances were found for HFpEF. HFmrEF showed sex-related differences in diastolic function.

Keywords: Heart Failure, heart remodeling, gender differences

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INFLUENCE OF ACTN3 GENOTYPE ON EXERCISE-RELATED INJURIES: A REVIEW OF THE LITERATURE

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Background: *These two authors contributed equally to this work.The p.R577X polymorphism in the *ACTN3* gene leads to the reduction (RX) or complete absence (XX) of the alpha-actinin-3 protein, which is an important structural component of the Z-disc in type 2 (fast-twitch) muscle fibers. It, therefore, is of tremendous interest in medical research, especially regarding its influence on sports performance. Furthermore, apart from multiple studies investigating the impact of the *ACTN3* genotype (RR, RX or XX) on muscle characteristics, research has been done on the link between it and the risk of a non-contact exercise-related injury.Objective:This review aimed to assess if this link could be established between the presence of the R577X polymorphism and non-contact exercise-related injury. **Material and methods:** A literature review of all open-access research studies was conducted using online databases such as PubMed and Google Scholar. This search identified five articles from 2014-2022, of which one was a systematic review, including a total of 13 studies. The keywords used were (ACTN3) AND (exercise-related injuries) OR (muscle injuries) OR (sports injuries) OR (muscle damage) AND (p.R577X polymorphism). **Results:** While each study tried to investigate homogenous groups, the total pool of participants differed regarding the type of sport and performance level. Of these, one study focused particularly on females, and the remaining research was conducted either on males or a mixed group of participants. While every study could document at least one association of *ACTN3* genotypes with either differing injury types or severities, no correlation could be established in the female-only study. The overall incidence of all types of injuries was higher in RR than in XX genotype. Researchers frequently tried to explain this by correlating participants with the RR genotype showing lower muscle and joint mobility. For example, Achilles tendinopathies, appearing in two studies exclusively in R-allele carriers, were associated with reduced ankle dorsiflexion. When only considering muscle injuries, the rate and severity in XX individuals was highest. **Conclusions:** The influence of the *ACTN3* genotype on the type and severity of exercise-related injuries could be fully established only in males, whereby it should be noted that there is only one study with exclusively female participants. Therefore, the current state of knowledge is not yet sufficient to serve as the fundamental base for genotype-specific injury prevention.

Keywords: ACTN3, p.R577X polymorphism, exercise-related injury, sports injury, muscle damage

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FEAR FROM A LIFE-THREATENING DISEASE AND DISCLOSING BAD NEWS. A COMPARISON OF GERMAN AND ROMANIAN PERCEPTIONS AND PREFERENCES.

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Background: Confrontation with an incurable diagnosis will affect many people in the course of their lives, either directly or through the illness of a relative. Breaking the news is an everyday task for a physician, that can be approached in different ways, but there are different expectations also as to how this should be seen. The aim of our study was to assess perceptions and feelings related to death/dying, and the way people consider being informed about a possibly fatal disease; to evaluate determinants associated with these perceptions and expectations. We also aimed to explore possible differences in the attitudes of two different cultures, Germany and Romania. **Material and methods:** We used online questionnaires to explore perceptions, preferences, and socio-demographic factors among individuals living in Germany and Romania. The obtained data were analyzed for

correlations in SPSS statistics. **Results:** We have found significant correlations between fearing death and education (p-0.022) or belief /atheist-religious (p-0.022). Willingness to find out details was also correlated with education (p-0.023); There was no significant difference in attitude to death among responders based on their gender, marital status, or urban/rural setting. When comparing the two cultures, contrary to our expectations, there was no significant difference in the consent to be completely informed about the severity and the prognosis or in considering psychotherapy. There was, instead, a highly significant difference between German and Romanian individuals related to the fear of death (59% vs 88%), considering psychedelics in a terminal phase (54% vs 20%) or the importance of religious faith in coping with the condition. 26% vs 8% of the respondents defined themselves as an atheist. **Conclusions:** The majority of respondents agree to be informed about their diagnosis. Individuals identified as atheists were more likely to fear death. Differences between German and Romanian attitudes were found mainly in domains related to cultural or religious components.

Keywords: fearing death, patient communication, processing bad news, life-conditional diagnosis

INDEX OF AUTHORS

INDEX OF AUTHORS