9th Polish Association for the Study of Pain Symposium – "Advances in pain management"

THURSDAY, OCTOBER 17TH, 2024

SESSION: Pain in Elderly Patients

Chairman: Tomasz Grodzicki,
Barbara Gryglewska,
Daniel Zarzycki

Is there a relationship between chronic pain in older people and cardiovascular risk?

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In recent years, reports have been published regarding the relationships between the incidence of pain and cardiovascular disease (CVD). According to the published data, CVD appears to be more common in patients with chronic pain. An increased risk of cardiovascular events and mortality was found in longitudinal studies in patients with chronic pain, even after relevant adjustments had been made for CVD risk factors. Pain and CVD share several pathophysiological pathways, such as sympathetic nervous system activation, inflammation, altered gut microbiota, and genetic profile. Also, the commonly used pain medications, such as non-steroidal anti-inflammatory drugs and opioids, increase cardiovascular risk. Lifestyle factors, including physical activity levels, are also associated with both chronic pain and CVD. Comorbidities associated with chronic pain may be important as well, as in addition to diabetes and hypertension, the risk of CVD is affected by depression/anxiety, cancer, arthritis, and inflammatory diseases. Even after adjusting for age, gender, recognized CVD risk factors, comorbidities, pain medications, and socioeconomic status, the association between pain and CVD as observed in the studies is only attenuated while remaining significant. The significantly increased cardiovascular risk in individuals with chronic pain suggests that more preventive measures are needed in this group of patients despite the fact that chronic pain has not been so far recognized as a condition associated with increased cardiovascular risk.

Pain *vs.* the Course and Management of Mental Disorders in the Elderly

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Depression, anxiety disorders, and insomnia are among the most commonly encountered mental disorders in the senior population, with prevalence significantly higher than in young adults. The aforementioned psychopathological conditions or symptoms have a bidirectional, pathophysiological relationship with pain symptoms, creating the BBLD syndrome – pain-insomnia-anxiety-depression, in which each element exacerbates the symptoms and worsens the treatment outcomes of the other three. In this context, it is extremely important for every physician to select pharmacotherapy that best addresses all elements of the BBLD syndrome (including the co-analgesic effect) without worsening any of them. This is particularly challenging because, on one hand, the effectiveness of psychotropic medications in treating psychopathological symptoms in the elderly is limited, while on the other hand, these medications tend to produce more adverse effects in seniors (such as constipation, dry mouth, drowsiness, or cognitive impairment) and complications (such as falls, altered consciousness, or torsadogenesis), and some of them may even worsen pain control.
These problems are usually associated with the need for combination therapy, which increases the risk of drug interactions or leads to irrational pharmacotherapy. A separate issue is the risk of undiagnosed, and consequently untreated, depression or other mental disorders in elderly patients suffering from chronic pain. This may arise from, for example, incorrectly perceiving depression as a "natural reaction" to aging and suffering, or the tendency, typical of the elderly, for patients to focus more on somatic complaints (including pain) than on emotional issues. Additionally, affective and anxiety disorders in this age group often present with a predominance of symptoms that may suggest the presence of a general medical condition, such as pain and other somatic complaints, fatigue, sluggishness, pseudodementia symptoms, or appetite disturbances.

Pain Control in Emergency

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In 2018, the SWDPRM system was used to analyze the medical records from 3.3 million trauma rides and emergency

Medical Team calls. As shown by the results of the analysis, only 24.4% of patients received any pain treatment. The situation is even worse in children, in whom painkillers are administered in only 24.1% of cases, the percentage being even lower in the group of young children. The most common analgesic medication was ketoprofen administered intramuscularly at a dose of 50 mg.
In order to improve this situation, a team of experts was set up to develop a list of good practices as the principles for the treatment of pain in the Emergency Departments. For the sake of maximum simplification, pain intensity was categorized into three subgroups: mild pain (Group I), moderate pain (Group II), and severe pain (Group III). Pain was also categorized in terms of location, i.e. into non-traumatic headache, chest, and abdominal pains as well as pain associated with trauma and burns.
Good pain management practices for adults and (separately) for pediatric patients were singled out. Elderly patients were not singled out for the sake of simplification of recommendations. In the realities of Polish emergency medical services, pain treatment is delivered by two groups of healthcare professionals, namely the paramedics and physicians. Different therapeutic options are available for each of these groups. Good practices have been developed so that both paramedics and physicians can treat pain as effectively as possible. The introduction of simple principles seems to be the best idea for the effective treatment of pain as delivered to patients by the „S" [specialist] and „P" [primary] Emergency Medical Teams. The article presents the detailed principles for good analgesia practices in the emergency setting.

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SESSION: The Societal Context Of Pain: How Social Interactions Affect Pain

Chairman: Przemysław Bąbel,
Marek Kowalczyk,
Ryszard Przewłocki

The Positive Side of Social Interactions: The Role of Social Context in Pain Reduction

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According to the IASP definition, pain is a personal experience influenced by biological, psychological, and social factors. In other words, the same pain stimulus can elicit different pain sensations in different individuals, as well as different pain sensations in the same individual at different times, depending, among other things, on social factors. This lecture focuses on the impact of other people on pain perception, from their image or presence, through the information they provide, to the observation of their pain behaviors live or on video. Various forms of social information and their effects on pain perception will be distinguished. The difference between verbal information about the effects of analgesics or placebo (e.g., "this is an effective painkiller") and information about someone's pain experiences (e.g., "thanks to this remedy, I felt less pain") will be highlighted, as well as the difference between observing a person experiencing pain relief live, watching their recording, and merely viewing their image. The results of studies indicating that social factors can have an analgesic effect, meaning they can be used to reduce pain, will be summarized. Therefore, particular emphasis will be placed on the implications of the discussed findings for clinical practice.
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Social interactions and pain: the role of social context in exacerbating and reducing pain

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Pain is a subjective experience that is shaped not only by biological factors but also psychological and social factors. The goal of this lecture is to discuss how social factors influence placebo analgesia, a phenomenon commonly observed in medical practice, as well as its negative counterpart, nocebo hyperalgesia. Placebo analgesia involves the reduction of pain after applying a treatment that essentially has no impact on pain, while nocebo hyperalgesia manifests as an increase in pain as a result of such a treatment.
Previous studies have shown that both effects may be a result of earlier direct (positive or negative) experiences with specific medical procedures. However, it turns out that they can also develop even in the absence of such experiences, only as a result of observing the pain reactions of other people undergoing such procedures. Information about possible treatment outcomes obtained from specialists can also contribute to their formation. During the lecture, experimental studies comparing the effectiveness of direct experiences and information acquired through social interactions in shaping placebo analgesia and nocebo hyperalgesia will be discussed. Factors that may enhance or reduce the influence of social information regarding pain on an individual's pain experiences and expectations about future pain will also be addressed. The findings from these studies will be discussed for application in clinical practice.
This lecture presents research funded by the National Science Centre, Poland, under projects no. 2019/35/B/HS6/04320, 2020/39/B/HS6/03551.

Body and Social Interactions: The Role of Social Information in Shaping Body Perception

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Biological, psychological, and social factors shape body perception. One of the key mechanisms shaping body knowledge is social interactions, which are based on both visual and verbal content.

Observation is a fundamental learning mechanism that also plays a significant role in the relationship with one's body. Behaviors related to visual culture and the presence of social media influence the perception of the body, its appearance, functioning, and evaluation. Exposure to social media (dominated by aesthetic-functional standards) can lead to a decrease in body satisfaction and a worsening of body image. A negative body image is observed among clinical patients experiencing pain (chronic pain, chronic back pain, acute back pain, cancer, endometriosis). According to recent reports, a distorted body image (particularly aspects related to distorted shape and size) is just as important a parameter as the intensity of experienced pain in patients suffering from pain. A distorted body image may become one of the significant factors observed in the clinical population. The interdependence between pain and a distorted body image will be discussed in the context of studies that use the observation of self-body manipulation in experimental conditions. These studies address aspects such as body shape and size and indicate that they can affect the reduction of pain sensation and improve the precision of sensory perception.
Social interactions based on verbal content also take contextual factors into account. The latest research shows that simple diagnostic verbal messages, especially those informing about potential threats, can influence not only the recognition of illness labels but also parameters related to body image. A summary of the latest research on the impact of social interactions on body perception will help in understanding the phenomenon of body image, as well as highlighting its role in the clinical context.
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Communication as an effective therapeutic tool: the importance of communication between medical specialist and patient

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Communication is one of the basic and common forms of contact between people. Scientists dealing with communication issues often point out that one can not only gain knowledge but also try to effectively develop one's skills in this area. Looking at a patient from a biopsychosocial perspective, it is increasingly observed that one's difficulties in adapting to the roles of a patient/doctor/physiotherapist are largely the result of communication disorders. What is more, communication between medical personnel and the patient and their family seems to be an important therapeutic factor. Communication in the medical staff-patient relationship requires specialists to take responsibility for each of the communication areas (motivation, knowledge, and skills). The very definition of professionalism in medicine implies that medical specialists are required to have appropriate communication knowledge, skills, and motivation to communicate, but it would also seem advisable to constantly educate oneself in this area. Especially if we examine how patients perceive this relationship and communication aspects. Over 50% of complaints about medical services concern the quality of medical services, which also includes interpersonal problems. Communication errors are illustrated here by the assessment of the quality of services provided (50%) and are also included in other problems (10%) related to the provision of health services. Therefore, most of the complaints submitted show the patient's level of satisfaction with the doctor-patient relationship.
A key element of communication between a physician and a patient is also reaching out to family resources (biological, psychological, etc.), regardless of which family member is the subject of this relationship, e.g. in order to conduct therapy as effectively as possible, select its scope or goal. Good communication will therefore be a therapeutic tool and will bring both the patient and the physician numerous benefits, while poor communication can cause errors that can adversely affect the patient's health. There is a lot of discussion about malpractice and medical errors, but it is worth remembering the inappropriate impact on the patient in the psychological sense, which can worsen their mental state and, as a consequence, exacerbate somatic symptoms.
What are the advantages of proper and patient-focused communication for a doctor? Focusing on the interlocutor allows for a decrease in a patient's emotional tension, which allows for further communication and exchange of information. Obtaining accurate data during a well-conducted history-taking focused on multiple aspects of functioning of the sick person will allow for an effective diagnosis of the disease, reduce the patient's resistance to therapy, and increase the patient's trust in the doctor, which may further convince the patient to use various methods of therapy. Within a well-functioning doctor-patient relationship, the patient's participation in therapy increases, there is no need to control them, they take care of their own well-being and are supported in this by their family, they have a sense of being listened to and understood, which makes the patient feel at ease when talking about their illness. Such effective communication increases the patient's satisfaction, and as a result, the number of complaints about individual doctors and the health service decreases, and patients more often show positive reactions and behaviors and are less aggressive. In case of patients experiencing pain, creating an atmosphere of understanding and attention to their needs, ensuring a sense of security and dignity will definitely affect the perception of pain and the techniques used to cope with the ailment. A sense of control over one's own health condition and bodily symptoms is a key element in building resources to fight in case of patients with chronic health problems. Moreover, investing in the development of communication skills allows physicians to increase self-esteem as a result of better therapeutic relationships and increased satisfaction with their profession.

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SESSION: Session of the PASP Orofacial Pain Section. International Classification of Orofacial Pain (ICOP), 1st edition.

Practical comments taking into account the specificities of Polish conditions

Chairman: Jolanta Kostrzewa-Janicka,
Błażej Szczerbaniewicz,
Bartosz Dalewski

Idiopathic orofacial pain according to ICOP classification, 1st edition
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Idiopathic orofacial pain is one of the most puzzling and challenging issues in interdisciplinary stomatology, particularly in the context of orofacial pain syndromes. For this reason, it was included in the first International Classification of Orofacial Pain, published by Cephalalgia in 2020 under Chapter 6, with a Polish translation released this year by the Polish Association for the Study of Pain. It complements the International Classification of Headache Disorders 3rd edition (ICHD-3), developed by the International Headache Society, and briefly addresses conditions such as burning mouth syndrome, idiopathic orofacial pain, idiopathic dentofacial pain, and continuous unilateral orofacial pain. These syndromes are categorized into chronic and probable types, often accompanied by somatosensory changes. This presentation will briefly cover the classification of idiopathic orofacial pain, typical clinical examples illustrating the problem and treatment strategies will be given, with particular emphasis on the role of the stomatologist and the specialist from the Pain Management Clinic.

Temporomandibular joint pain. A practical commentary with clinical examples
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The first classification of orofacial pain (ICOP) was created by a committee that included specialists who developed other classifications in this area (OFHP, IASP, INfORM, AAOP, IHS). Thanks to this, temporomandibular joint pain was unified and enriched with diagnostic criteria developed for temporomandibular disorders (DC/TMD). The ICOP classification includes those temporomandibular joint disorders that are accompanied by pain, which allows specialists working in the area of head and neck pain to communicate with specialists who deal with the therapy of temporomandibular disorders, including temporomandibular joint disorders. The meticulous guidelines for the examination and diagnosis of symptoms in the temporomandibular joints according to ICOP can allow for a diagnosis that precedes causal therapy. The assessment of the symptoms, their duration, location, and their modification under the influence of specific factors should be replicated during the examination using appropriate provocative tests, which allow for the indication of "familiar" pain, with or without assistance, through the additional use of the DC/TMD criteria.

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SESSION: Opioids in Pain Medicine – Pros and Cons

Chairman: Andrzej Kübler,
Jarosław Woroń,
Anna Przeklasa-Muszyńska

The story of fentanyl – from glory to condemnation
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Fentanyl was synthesized in 1960 at Janssen in Belgium as a result of years of researchers' work to create a new synthetic opioid with more favourable clinical effects than those previously used. Fentanyl is 100 times more potent than morphine, with a faster and shorter action, and it lacks some of morphine's side effects. In 1963, fentanyl began to be used for general anaesthesia and quickly became the most commonly used analgesic in anaesthesiology. This led to a significant increase in sales of this agent worldwide. Although in the meantime other similar drugs have been synthesized, such as sufentanil, alfentanil, and remifentanil, they have not displaced fentanyl from the market, and it continues to be widely used in clinical anaesthesiology. Another method of administering fentanyl has become the transdermal application. The use of fentanyl patches has become very popular among patients with cancer pain. Another clinical possibility for utilizing fentanyl is mucosal administration. When administered this way, fentanyl acts very quickly. In the form of sublingual tablets or nasal or oral spray, it is particularly useful for patients experiencing breakthrough pain in cancer treatment. Mucosal use of fentanyl is also suggested in emergency medicine for pain caused by medical procedures and even in paediatrics.
The clinical use of fentanyl is safe when it is carefully monitored. A lack of proper control and non-medical use can lead to addiction and overdose. In the second decade of the 21st century, fentanyl and its analogues have become the most common cause of death due to opioid abuse. In the USA, its misuse is associated with the so-called opioid epidemic. Currently, "fentanyl panic" is being spread in the media in Poland. This can lead to fear of prescribing fentanyl and concerns about its use, which may cause immense suffering for people in need of this medication. When using opioids in medicine, it is essential to remember that they are very potent drugs, and tragic complications should not be blamed on fentanyl itself but rather on its users.

Why opioid analgesics are still very safe drugs, or the prescription and media reality are not the same
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Pharmacotherapy for pain is based on the use of analgesics from various pharmacological groups. Currently, there is an increasing interest among physicians in opioid analgesics (OAs), which demonstrate an analgesic effect for pain of moderate to severe intensity. This growing interest is also related to the easier management of analgesia compared to other pain medications, primarily due to the pharmacokinetic profile of opioid analgesics. Recently, fentanyl has become a scapegoat in the media – a drug with a well-known therapeutic profile and recognized risks associated with its use. This raises the question of whether the current sensationalized reports of improper use of fentanyl for non-medical indications justify the negative campaign that has spread across various media.
In 2023, there were 163 reported cases of fentanyl-related deaths across the European Union, which is relatively low in the context of drug misuse, highlighting the pathologies within pharmacotherapy. Current medical knowledge regarding fentanyl supports the following claims:

- Fentanyl remains an effective and safe medication for managing acute, postoperative, and cancer-related pain.
- The use of fentanyl must be based on a personalized approach with titrated dosing, which is essential for appropriate pain pharmacotherapy.
- Fentanyl should not be prescribed through automated prescription machines.
- The use of fentanyl for non-medical indications poses a high risk of addiction and complications.
- There are no reasons to restrict the use or dosage of fentanyl in rational pain pharmacotherapy.

Opioid Analgesics in the Intensive Care Unit: Strategies for Minimizing the Risk of Misuse

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Patients hospitalized in intensive care units experience pain due to invasive procedures, prolonged immobilization, and/or mechanical ventilation. Inadequate pain control can lead to adverse effects such as agitation, delirium, or impaired healing in the postoperative period. Long-term immobilization induces muscle atrophy and impairment of ligament and tendon function. Other causes and factors modulating pain in ICU patients include sleep disturbances, impaired communication, and limited contact with the loved ones. Many ICU patients are unconscious, and therefore assessing their pain is often a challenge. Behavioral scales such as the Behavioral Pain Scale (BPS) the Care Pain Observation Tool (CPOT) are the most common tools used to assess pain in these patients. It is extremely important that pain intensity be measured routinely, just like other vital signs. In conscious patients, routine assessments are carried out using the NRS scale. The minimum thresholds requiring intervention and introduction of treatment are NRS 4, BPS > 5, and CPOT 3. The basic principle of proper pain management within the ICU setting consists in each patient being treated individually, analgesia being adjusted to the patient's condition and the function of individual organs. Multimodality of analgesia, i.e. multiple techniques and analgesics being combined, is also important so that adequate pain relief can be achieved by acting on different levels of pain conduction pathways with fewer side effects. Minimization of sedation is an extremely important element in reducing the risks of opioid use. The analgesic ladder strategy facilitates a reduction in the use of sedative drugs, leading to shorter mechanical ventilation times and shorter ICU stays. This reduces the risk of delirium while resulting in early mobilization and improved patient outcomes. Daily breaks in sedation are also advisable. Pain management in the ICU setting involves the use of pharmacological as well as non-pharmacological treatment (physical therapy, relaxation techniques). With regard to pharmacological treatment, opioids are commonly used in the ICU setting in the form of continuous intravenous infusions, while patient-controlled anesthesia (PCA) is used infrequently. Fentanyl increases the stiffness of thoracic muscle and may thus impair respiratory capacity and weaning from mechanical ventilation. Ketamine reduces the need for opioids and has an antidepressant effect through glutamatergic blockade while lidocaine has found particular use in visceral and neuropathic pains.
Regional anesthesia techniques practiced in the ICU setting include peripheral nerve blocks and continuous epidural anesthesia.
Specific aspects of analgesia within the ICU include minimization of opioid use, identification of patients at high risk for severe acute pain (multi-organ trauma, burns), the use of appropriate multimodal analgesia (including ketamine, regional analgesia), intermittent opioid boluses being delivered rather than continuous infusions (to avoid excessive dose escalation), titration of opioids to tolerable pain intensities, and making decisions regarding continued opioid treatment at discharge from intensive care. A large group of patients hospitalized in intensive care units are elderly patients with respiratory as well as renal and/or hepatic impairment. In the case of renal/or hepatic impairment, dosage adjustment or introduction of alternative drugs is necessary to reduce the accumulation of metabolites and the related toxicity. Patients at high risk of respiratory depression must be continuously monitored by pulse oximetry and capnography. Patients with chronic pain require regular evaluation of the need for continued opioid treatment. In addition to regular pain assessments, sedation should be monitored (RASS/SAS). As regards procedural pain, preemptive actions should be taken to prevent pain associated with surgical and diagnostic procedures.

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SESSION: Pharmacotherapy of Pain – Translational Aspects

Chairman: Joanna Mika,
Renata Zajączkowska,
Magdalena Kocot-Kępska

New drugs in pain medicine – myth or reality?

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According to epidemiological data, nearly one in five Europeans surveyed experiences moderate or severe chronic pain (NRS > 5), defined as pain lasting at least six months, with moderate or severe pain having occurred within the last month and at least twice a week. Chronic pain negatively affects the quality of life of patients and their families, increases the risk of depression, anxiety, sleep, and cognitive disorders, and poses a burden on healthcare systems and society at large.

The search for methods of prevention and treatment of patients with chronic pain is one of the priorities of healthcare systems, pharmacotherapy being one of the main areas of research. According to estimates, approval of each new drug for clinical use takes nearly 10–15 years and requires an expense of more than $1–2 billion.

Despite the huge amounts of money and hopes placed on analgesics showing efficacy in preclinical experimentation, only 11 analgesics have been registered by the FDA between 2018 and 2023, nine of which are drugs for the prevention and treatment of migraine (gepants, ditans, anti-CGRP antibodies). The remaining agents are oliceridine, a new opioid analgesic with a complex mechanism of action, and elagolix, a hormonal drug used to treat pain in endometriosis.

Current clinical research in humans focuses on drugs that act on VGSC sodium channels, VGCC calcium channels, and subtypes of the TRP ion channel (TRPV1, TRPA1) which are involved in physiological and pathological nociception, particularly in the formation of peripheral and central sensitization.

An additional area of research consists in analgesics acting through the glutamatergic system and mGluR5 receptors. A clinical trial evaluating the efficacy and safety of basimglurant in the indication of trigeminal neuralgia is currently underway.

Novel atypical opioid analgesics are also being sought, as well as new formulations of "old" opioids to prevent overdose. Cebranopadol, buprenorphine analogs, and dinalbufine are currently under investigation in clinical trials. All of these drugs are opioids that are assumed to have a lower risk of side effects, including addiction and overdose, due to their multi-receptor mechanisms of action.

Clinical trials are also underway to evaluate the efficacy and safety of new formulations of "old" drugs, such as controlled-release pregabalin.

Many substances which had shown efficacy in laboratory animal experimentation failed to prove their analgesic efficacy or caused serious adverse reactions in clinical trials. This includes cannabidiol, anti-NGF monoclonal antibodies (fulranumab), and angiotensin AT2R receptor antagonists (olodanrigan).

Another area of research that is most promising in pain medicine is the implementation of chronic pain prevention in the form of herpes zoster vaccination. Clinical trials are clearly indicative of the Shingrix vaccine being effective in about 90% of the adult population as pertains to the reduction in the incidence of herpes zoster and the risk of post-herpetic neuralgia.

To sum up, the advances made in the area of pharmacotherapy in modern pain medicine include antimigraine drugs and the possibility of preventing postherpetic neuralgia through vaccination. Other areas of research are promising, although a breakthrough in the search for new, safer analgesics, is not to be expected.

Revisiting natural-derived compounds in polypharmacotherapy: astaxanthin in the treatment of neuropathic pain

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As shown by the recent statistical data, neuropathic pain may affect up to 10% of people worldwide, thus representing a significant health problem which affects the quality of life and daily functioning of patients. Due to the complex etiology and to the molecular and cellular mechanisms still not being fully understood, the treatment of neuropathic pain remains a particular challenge. The recommended drugs often fail to produce satisfactory results, and the accompanying side effects significantly limit their therapeutic utility. It is therefore necessary to search for new pharmacological agents with higher efficacy with a better safety profile. Compounds of natural origin, which have many beneficial biological properties, are regaining popularity. One of such substances is astaxanthin, a carotenoid characterized by potent antioxidant activity and, as confirmed in recent years, effects on various molecular signaling pathways, including those involved in pain transmission. The objective of this study was to determine the effectiveness of astaxanthin in murine models of neuropathic pain (the Bennett model of loose sciatic nerve ligation and the streptozotocin-induced diabetic neuropathy model), as well as its effect on morphine tolerance. Biochemical analysis of the selected immune factors which may be associated with the observed behavioral effects was also carried out. Experimental results indicate that single-dose administrations of astaxanthin reduced tactile and thermal hypersensitivity in mice in both models. In addition, when administered repeatedly, the substance was shown to delay the development of morphine tolerance. Remarkably, the analgesic effect of astaxanthin was superior to that of morphine in models of neuropathy of different etiology; what's equally important, no tolerance to its effects has developed until the experiment completion date. The studies of changes in mRNA and protein expression levels confirm that the efficacy of the compound may be due to its multidirectional

action on various factors important for nociception. In conclusion, astaxanthin appears to be a promising compound for the treatment of neuropathic pain while further studies are required to precisely determine its mechanism of action and clinical efficacy. The experiments also confirm that research into the use of naturally derived compounds could be promising in the context of complementary medicine, with certain long-known substances having the potential of being used as adjuncts to conventional therapy.

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Mirogabalin – scientific and clinical aspects

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Mirogabalin is a new medication that was registered in Japan in 2019. Along with gabapentin and pregabalin, it belongs to the gabapentinoids, a class of drugs that selectively bind to the α2δ subunits of voltage-gated calcium channels (VGCC). The binding of mirogabalin to the α2δ subunits of VGCC reduces neuronal calcium influx, inhibits the release of pronociceptive neurotransmitters from presynaptic neuronal endings, and slows or blocks the conduction of nociceptive information in the dorsal horns of the spinal cord. As a result, it limits the characteristic hyperexcitability of neurons associated with neuropathic pain and leads to specific clinical outcomes, such as analgesic, anxiolytic, and anticonvulsant effects.

Current studies confirm the analgesic efficacy of mirogabalin in alleviating pain associated with painful diabetic polyneuropathy and postherpetic neuralgia, along with its good safety profile and relatively low incidence of adverse effects compared to pregabalin and gabapentin. Compared to pregabalin, mirogabalin shows a stronger affinity for the α2σ-1 and α2σ-2 VGCC subunits and has a slower dissociation from the α2σ-1 VGCC subunits compared to the α2σ-2 VGCC subunits. This contributes to a better analgesic efficacy of mirogabalin, a wider safety margin, and a relatively lower frequency of adverse effects.

Although the main mechanism of action of mirogabalin on VGCC has been described, it remains unclear how mirogabalin affects the disrupted neuroimmune interactions at the spinal cord level in neuropathy, which is critically important from a clinical perspective. My research, conducted in collaboration with Professor Joanna Mika's team at the Institute of Pharmacology of the Polish Academy of Sciences in Kraków, demonstrated that mirogabalin increases the expression of antinociceptive factors: interleukin IL-10 and interleukin-18 binding protein (IL-18BP), while reducing the concentration of pronociceptive substance P at the spinal cord level. Furthermore, mirogabalin enhances the antinociceptive effects of strong opioids (morphine, oxycodone, buprenorphine) and ketamine. This supports the hypothesis that pharmacologically enhancing the antinociceptive and anti-neuropathic effects of mirogabalin by combining it with the aforementioned strong opioids or ketamine may represent a new and more effective therapeutic strategy for treating neuropathic pain.

Further research is essential to determine the role of mirogabalin in the treatment of neuropathic pain of etiologies other than diabetes or herpes virus infection, including central pain and fibromyalgia, to confirm its long-term efficacy and safety, and to establish its position in neuropathic pain treatment protocols.

Pharmacological modulation of microglia/macrophages and neutrophils – new perspectives in neuropathic pain therapy

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Despite ongoing research, the mechanism of neuropathic pain is still not fully understood, which is why treatment does not bring satisfactory relief in many cases. Moreover, this type of pain may be different in women and men. This may be due to the diversity of cell populations and the influence of immunological and hormonal factors on the body. Recent preclinical studies suggest significant differences in the activation of microglia, macrophages and neutrophils in painful neuropathy. The aim of the study was to determine whether and how an inhibitor of microglia/macrophages (minocycline) and neutrophils (4-ABAH) affect mechanical and thermal hypersensitivity in male and female mice after sciatic nerve ligation, and also to investigate whether and how these substances modulate morphine tolerance. Biochemical studies were also conducted to explain the immunological basis of the observed behavioral effects. Studies have shown that repeated administration of minocycline is able to alleviate pain symptoms and also the development of morphine tolerance, but only in males and not females. Importantly, biochemical studies have also shown sex-dependent differences in the protein levels of selected cell markers and cytokines. In contrast to minocycline, 4-ABAH was able to alleviate hypersensitivity to mechanical and thermal stimuli, and also to delay the development of morphine tolerance in both male and female mice after nerve ligation. Surprisingly, a difference in the protein levels of selected cell markers and cytokines was also observed between the sexes, although the analgesic effect was similar. In summary, our results indicate that inhibition of neutrophil activation/influx may be beneficial in the treatment of neuropathic pain in both sexes, while inhibition of microglia/macrophages is effective only in one sex. Further extensive studies, including clinical ones, are undoubtedly necessary to confirm the effectiveness of such cellular modulations.

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THURSDAY, OCTOBER 17TH, 2024

SESSION: Session of the PASP Orofacial Pain Section. International Classification of Orofacial Pain (ICOP), 1st edition. Practical comments taking into account the specificities of Polish conditions

Chairman: Bartosz Dalewski,
Jolanta Kostrzewa-Janicka,
Błażej Szczerbaniewicz

Craniofacial pain. Stabilization of the cervical spine. Methods of the autonomic nervous system modulation

Michał Klich
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Idiopathic craniofacial pain is a phenomenon that still leaves a lot of ambiguity and controversy. Its idiopathic character frequently stands only to the point of getting beyond one's own area of interest and competence. A toothache of mechanical origin may not respond to dental, pharmacological, or other treatment as the origin of pain is frequently located in areas very distant from the site of occurrence. The head is a particular region where pain can be projected or radiated from the cervical spine, shoulder girdle, trunk, or pelvic girdle. Hence the importance of even the basic knowledge of the mechanical and anatomical relationships within the human body.

The concept of posture and the knowledge of its benchmark parameters can be helpful in explaining the interrelationships of disorders and pain. It is postural defects of various kinds that frequently lie at the root of ailments ranging from malocclusion to migraine. Another area of functional disturbance being the source of many misdiagnosed ailments, including head ailments, is cervical stabilization which may result from or alternatively cause postural defects. External and internal stabilization mechanisms and neuromuscular control are concepts capable of providing explanation to numerous ailments experienced by orthopedic, dental, or neurological patients. As clinicians, we have a direct influence on these phenomena, e.g. through numerous manual techniques which broaden the range of our possible interactions with the pain patient.

When considering the causes of pain in the head area, it is impossible to ignore the influences of the autonomic nervous system, especially the overactive sympathetic part of it. Direct anatomical links between the autonomic nervous system and the musculoskeletal system provide opportunities for modulation of neural activity e.g. by means of manual techniques or simple exercises. Beyond doubt, the manifestation of pain symptoms resulting from excessive stimulation of the sympathetic nervous system is becoming a growing medical phenomenon. The search for novel ways to modulate the activity of the autonomic nervous system is triggered e.g. by various kinds of somatization of emotional conditions.

At this point, it is important to emphatically reiterate the principle of the interdisciplinary approach to the patient, widely discussed and yet so rarely applied in the medical setting.

Orofacial pain resembling a primary headache. A practical commentary with clinical examples

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Orofacial pains resembling primary headaches are diagnosed in patients presenting with no cranial pain. As the name implies, these pains involve the mouth and face region and resemble one of the primary headaches in nature, duration, severity, and accompanying symptoms. Primary orofacial pains include orofacial migraine, tension-type orofacial pain, cluster-type orofacial pain, paroxysmal hemifacial pain, and vascular orofacial pain.

The etiopathogenesis of orofacial migraine is not entirely clear; it is possible that it is the same as that of migraine located in the head. Orofacial migraine is very rare, and it is suspected that it is also underdiagnosed. So far, no bilateral form of orofacial migraine has been described; the literature contains reports of patients experiencing orofacial migraine with aura. Orofacial migraine may present as toothache, mimicking dental pulpitis. According to literature reports more than one-half of patients with orofacial migraine have undergone dental treatment. In the meantime, migraine-targeted treatment is recommended.

Neurovascular pain is characterized by moderate to severe intensity and duration of a few minutes to a few hours sometimes up to 3 days. It may resemble a toothache and/or present with pulsatile nature. It is accompanied by at least one ipsilateral autonomic symptom and/or hypersensitivity to light and sounds, and/or nausea or vomiting. This type of pain is triggered by cold drinks or meals – hypersensitivity to cold is present both during and between pain attacks. By definition, the pain is intra-oral, but it can radiate to other areas of the face (mouth, cheeks, preauricular area, infraorbital area). The pain most often affects one side of the face; however, the location can alternate or, in about 1/3 of patients, be bilateral. In most cases of neurovascular pain, prophylactic treatment is necessary.

Thorough differential diagnosis, including consideration of orofacial pains resembling primary headaches, is extremely important in the management of patients complaining of pain within the orofacial region. Due to the clinical presentation being suggestive of a dental cause of complaints, numerous patients are subjected to root canal treatment.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Pain Management in Palliative Medicine

Chairman: Wojciech Leppert,
Marcin Janecki,
Elwira Góraj

The choice of an optimal management of patients with breakthrough pain

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Breakthrough pain (BP) was defined in 2009 by Davies et al. as a transient exacerbation of pain that occurs spontaneously or in association with a specific predictable or unpredictable trigger, despite relatively stable and well-controlled background pain. In 2016, Løhre et al. introduced the concept of episodic pain (EP) as a much broader concept than BP. EP is any short-term and significant increase in pain intensity (score above 2 on the NRS), occurring in patients with effectively treated background pain, in patients whose background pain is ineffectively treated or absent, and regardless of the use of opioids.
The treatment strategy for BP and EP, according to the 2024 recommendations of the Polish Society of Palliative Care, the Polish Society of Pain Research, and the Polish Society of Clinical Oncology regarding the diagnosis and treatment of pain in cancer patients, is based on the diagnosis of the type of pain and the implementation of therapy aimed at the cause and pathomechanism of pain. The assessment of background pain and episodes of pain exacerbation in the context of other symptoms, as well as psychological, social, and spiritual problems of patients and caregivers plays a key role. The Breakthrough Pain Assessment Tool (BAT) is a useful research tool for the assessment of patients with BP and EP. In spontaneous and incidental involuntary pain, treatment usually involves the use of analgesics at the time of pain exacerbation – fentanyl products with a rapid onset of action administered intranasally, buccally, or sublingually (according to the SmPC registered for the treatment of cancer patients with at least 7 days of opioid therapy in daily doses corresponding to at least 60 mg of oral morphine), or traditional opioids (most often tramadol, morphine and oxycodone) administered intravenously or subcutaneously, less often orally. In the case of slowly increasing intensity of spontaneous pain and predictable pain exacerbations associated with activity (incidental voluntary pain) or procedures (procedural pain), traditional immediate-release opioid products are used, most often orally, subcutaneously, or intravenously. The use of non-opioid analgesics, adjuvant analgesics (co-analgesics), and non-pharmacological methods of pain therapy can be considered in the treatment of patients with all types of pain exacerbations. Comprehensive and individual therapeutic procedures that take into account a thorough clinical assessment, preferences, and patient satisfaction with the treatment allow for optimal treatment of BP and EP, and a significant improvement in the quality of life of patients and families.

The role of targeted therapies in the treatment of cancer patients with bone pain

Marcin Janecki
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Thanks to the increasing efficacy of cancer treatment, the survival times of patients become longer, significantly increasing the risk of tumor metastases. The skeletal system ranks third in terms of the quantitative location of metastases, and is also one of the most rapidly attacked systems in the human body, in this regard being led by breast and prostate cancers. In postmortem examinations of patients who had died from these cancers, metastatic lesions to the skeletal system are observed in about 70% of cases. These are followed by thyroid, kidney, and lung cancers, for which the postmortem examinations reveal bone metastases in as many as 30 to 40% of patients. Due to their frequent incidence in the population, breast, prostate, and lung cancers are estimated to probably be responsible for more than 80% of all metastatic bone lesions.
Cancer-related pain remains a significant problem, negatively affecting the patients' quality of life. Bone metastases are one of the most common causes of this pain, occurring in 60–84% of patients. 75% of patients describe their pain as moderate to severe while as many as 23–45% of patients declare their pain is poorly controlled.
Conventional treatment of bone pain is based on a multimodal approach and includes, in addition to pharmacotherapy (analgesics, steroids, bisphosphonates), radiation therapy, systemic treatment (hormone therapy, chemotherapy, radioisotopes), surgery, and physiotherapy. Unfortunately, chronic pain associated with bone metastases is relatively resistant to analgesics and remains a significant clinical problem. In addition, non-steroidal anti-inflammatory drugs have a negative effect on healthy bone function by inhibiting prostaglandin production. Similarly, opioids can disrupt metabolic processes within the bone and increase the risk of pathological fractures. Consequently, alternative supportive treatments for bone pain are being sought, based on potential mechanisms of pain development. This search has become the basis for the development of a number of biologic drugs as potential coanalgesics designed to dramatically improve bone pain control. Several of these drugs defining the basis for targeted bone pain therapy shall be presented in the lecture.

Application of Traditional Chinese Medicine Palliative Care in Cancer Pain Management

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Traditional Chinese Medicine (TCM) palliative care (PC) is a medical model that integrates TCM theories and therapies into palliative treatment to alleviate patients' suffering and improve quality of life, especially for chronic diseases like cancer, neurological diseases, heart diseases, and related pain. The application of TCM PC in relieving cancer pain is becoming wide accepted and spread, with the advantage of multiple therapies basing on treating the whole person with TCM theories of "holistic concept" and "syndrome/pattern differentiation". Together with conventional medical theories,

TCM PC pain management could develop more precise and personalized treatment plan for cancer pain patients. It includes diagnosis with both TCM pattern and constitution first, and then develop continuous treatment with multiple therapies including Chinese medicine and no-medicine therapies like acupuncture, moxibustion, Tuina, and many physical and psychological interventions. There more and more evidences shown their effectiveness and efficiency in alleviating pain symptoms, shorten the onset time of analgesics, prolong drug efficacy, reduce opioid dependence, and improve sleep, appetite, and psychological states of cancer patients with pain, with safety and less side effects.

What's new in opioid analgesics?

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Despite the appropriate use of opioid pain medications, which are key to relieving cancer pain, they are not always effective, and adverse side effects can limit their analgesic effects. Therefore, there is a significant need for more effective treatment options, especially in reducing opioid-induced side effects.
Drugs containing substances with different mechanisms of action have been introduced to the market in recent years, e.g. oxycodone/naloxone, tramadol/paracetamol, or dexketoprofen. Such combinations show an additive or synergistic effect, or a reduction in the side effects caused by opioids.
New formulations of older-generation drugs with prolonged, controlled release and transdermal systems have allowed for more consistent and lasting pain relief, provided better sleep, fewer episodes of breakthrough pain, and better control of end-of-dose pain, and thus a lower risk of misuse and abuse of opioids, especially in patients with persistent pain. Convenience in using preparations and better compliance with physician recommendations have become equally important. New routes of administration of opioids, including fentanyl, in transmucosal forms – intranasal, buccal, and sublingual – have provided faster and more effective therapy in the treatment of breakthrough cancer pain in adults.
Opioids with a complex mechanism of action such as tapentadol and cebranopadol are a new class of centrally acting analgesics. Their synergistic and complementary analgesic effects have been demonstrated at the spinal level – tapentadol acts as an agonist of the mu opioid receptor and an inhibitor of noradrenaline reuptake, while cebranopadol inhibits the nociceptin/orphanin receptor. Coactivation of these receptors can reduce the side effects of opioids without worsening analgesia, and their efficacy has been proven in various chronic pain syndromes: nociceptive, neuropathic, and neoplastic.
Constipation and opioid-induced bowel dysfunction (OIBD), one of the most common side effects, can be effectively treated by peripherally acting mu opioid receptor antagonists (PAMORA), which effectively restore normal function of the intestinal nervous system by blocking mu opioid receptors in the intestinal wall without crossing the blood-brain barrier. Similarly, the use of naloxone reduces the symptoms of OBID, resulting from local antagonist activity at intestinal opioid receptors and low oral bioavailability of naloxone, especially in the extended-release formulation.
The optimal use of opioid analgesics is significantly limited by the side effects resulting from their passage through the blood-brain barrier. The search for increasingly selective kappa-opioid receptor agonists, so-called peripherally restricted kappa-opioid receptor agonists (pKORA), provides new possibilities for effective analgesic therapy with a more favorable side effect profile.

The use of intervention techniques in the treatment of chronic pain in cancer patients

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Interventional techniques to manage cancer-related pain are most often used as part of multimodal therapy. The indication is pain that responds poorly to conventional pharmacotherapy or is associated with intolerable side effects. Interventional treatment can be used at any stage of cancer. The indication is also situations in which, due to concomitant diseases, we can predict the occurrence of side effects and an interventional option of treatment is more beneficial for the patient. We presented a case report of a 75-year-old patient with bone metastatic prostate cancer, reporting pain in the L-S vertebral bone section, and pelvis. Coexisting factors hindering effective pharmacological treatment were chronic renal failure and recent acute pancreatitis. The man was treated with a combination of blockages and ablation of the intervertebral joints in the lumbar section.
Interventional procedures should be considered when the pain mechanism allows to expect good effects, as confirmed by scientific evidence.
They are increasingly used as a conscious choice of the patient, preceded by information about existing and available alternative methods of treatment.
In oncological patients, peripheral blockages are used less often than in non-cancer pain or in acute pain. Their use should allow to reduce the doses of drugs administered, which also reduces side effects. But in some cases, resistant pain may be the only method leading to good pain control. On the basis of the presented cases, some of the techniques together with the drugs/medical products used, such as LZM, botulinum toxin, and tropocollagen, along with the indications for their implementation, were presented.
We presented a case report of a 77-year-old woman after the treatment of follicular lymphoma TP53 (multiple lines of treatment were used). During the course of therapy, she had a herpes zoster infection with a large area of neuropathic pain in the left part of the head and neck. There was no response to extensive pharmacotherapy trials. Intradermal injections of skull points with tropocollagen and finally botulinum toxin

gave a good relief of pain. In cancer patients, regardless of the stage of the disease, the use of tropocollagen in injections is considered a safe method.
Tropocollagen can be administered by various techniques: periarticular, subcutaneous, intramuscular, or *myofascial* injections. A beneficial effect is obtained when the collagen preparation is administered in direct (if anatomically possible) proximity to the pain receptors (receptor sites), or acupuncture points.
Tropocollagen can also be used for local treatment of wounds and bedsores, which was used in the presented case of erythromelalgia.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Session of the PASP Interventional Section*

Chairman: Dariusz Kosson,
Denis Dupoiron,
Bartosz Czapski

Revolutionizing Pain Management: "Ultrasound Guided Percutaneous Cryoneurolysis for Chronic and Acute Pain" and the Role of the International Society for Ultrasound-Guided Cryoneurolysis

Igor Filipovski
Nordic Cryo Clinic, Kopenhagen, Denmark

This presentation explores ultrasound-guided percutaneous cryoneurolysis as a cutting-edge technique for treating chronic and acute pain, as well as spasticity. By precisely targeting peripheral nerves, cryoneurolysis disrupts pain signals, offering a minimally invasive option that provides long lasting pain relief.
With real-time ultrasound guidance, this procedure enhances both effectiveness and safety, reducing the risks associated with conventional methods.
We will discuss its diverse applications, including the treatment of neuropathic, musculoskeletal, and cancer-related pain, along with its use in managing spasticity.
This versatile approach demonstrates significant benefits across various patient populations.
In addition, the presentation will introduce the International Society for Ultrasound Guided Cryoneurolysis, emphasizing its vital role in advancing research, education, and best practices within this growing field.
Join us as we explore how ultrasound-guided percutaneous cryoneurolysis is shaping the future of pain management worldwide.

Intrathecal drug delivery in pain medicine. How we got started

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Introduction: In February and June 2024, three implantations of intrathecal drug delivery systems (ITDDS) for the treatment of secondary cancer-related chronic pain were performed at two Warsaw hospitals, the Department of Neurosurgery at the National Institute of Medicine of the Ministry of the Interior and Administration and the 1st Department of Anesthesiology and Intensive Care, Medical University of Warsaw. In the perioperative period, patients undergoing the procedures were hospitalized in the Neurosurgery Department and the Intensive Care Unit, respectively.
Single-agent intrathecal therapy was used in both cases. The first patient was treated with morphine while zyconotide was administered to the other two patients. The treatments were carried out despite the lack of financing by the National Health Service.
Based on the experience from the procedures, the authors of the presentation:

1. Assess the current possibilities and identify the difficulties in the treatment of secondary cancer-related chronic pain using ITDDS in Polish conditions.
2. Estimate the actual cost of chronic pain management using the ITDDS.

The purpose of the observations was to gather information so as to help in the development and estimation of costs of the procedure of ITDDS implantation and treatment.
Results: At present, ITDDS implantation procedure and continued treatment as carried out in Polish conditions is associated with numerous difficulties. Some of these difficulties are rather obvious and include the lack of reimbursement for the implantation procedure, the pump, and the instrumentation required for implantation as well as the availability of drugs dedicated to this therapy being insufficient in relation to the actual demand. Morphine is available only by the targeted import procedure while zyconotide is available only through the rescue pharmacotherapy access system (RDTL). In both cases, the procedure for obtaining the drug is time-consuming, which can result in the drug being not available at the necessary time for the patient.
The less obvious problems as identified from our experience include the lack of sterile drug preparation procedures (regarding both the first and subsequent pump refills) and the inability to use intrathecal combination therapy (as of today, this problem has not been solved elsewhere in the world either). A reduction in the activity of other providers previously providing treatment to patients was also observed after the initiation of ITDD therapy.
The actual costs of the ITDDS implantation procedure in a patient hospitalized within the ICU were estimated and divided into 3 groups including the costs of stay, medications, and tests. The results are tabulated in Tab. I. The costs of the operating room were not included.

Tab. I. Actual costs of ITDDS implantation procedures in patients hospitalized in ICU vs neurosurgery department.

Patient	Stay within the ICU*	Stay within the N-surgery dept**	Drugs	Tests	Total cost (PLN) in case of ICU stay
No. 1 (6 days)	30,049.38	10,200.00	15,812.00	2,329.03	48,190.41
No. 2 (7 days)	35,057.61	11,900.00	14,019.00	2,313.03	51,389.64

*cost of stay within the ICU: PLN 5,008,23/day.
** cost of stay within the neurosurgical department: about PLN 1700/day

The costs of the ITDDS implantation procedure in a patient hospitalized within a neurosurgical unit department are lower as compared to the ICU; however, one must keep in mind that intrathecal administration of drugs (especially morphine) is associated with the need for close monitoring of the patient's condition in the OR or ICU setting for the period required for the titration of the effective dose. Excluded from calculations above were the cost of the ITDDS with dedicated instrumentation (approximately PLN 33,750) and the drugs for intrathecal administration. In the case of ziconotide monotherapy, the average cost amounts to PLN 12,814.58 whereas in the case of morphine, it is up to about PLN 2,000 (the price depends on numerous factors, including drug concentration, number of ampoules ordered, transportation costs, etc.) per about 50 days of treatment. Taken together, these account for about 50% of the total cost.

Conclusions: Based on our observations, we conclude that:

- The procedure for ITDDS implantation and further treatment of chronic pain is cost-intensive, particularly due to the price of drugs and implantable devices as well as the need for detailed monitoring of the patient's condition once the delivery into the subarachnoid space is started.
- Possible reductions in costs can be sought in meticulous pre-hospital qualification for the procedure (and anesthesia) and proper preparation of the patient by the referring teams, thus reducing (to the minimum necessary) the number of days the patient spends within the ward capable of adequate monitoring of the patient's condition and delivering mixed drug solutions in the therapy.
- In order to improve the ordering and preparation of drugs to be delivered via ITDDSs, they should be made available in the Polish market and the procedures related to their ordering for a particular patient should be liberalized. It is also advisable to establish centers for sterile preparation of drug solutions intended for intrathecal administration distribution of these drugs to the patients (this is particularly important in the context of ITDD therapy using drug mixtures).
- In light of our observations, it also appears important to establish appropriate procedures for the qualification for implantation, the implantation procedure itself, and the subsequent management of patients treated using the ITDDSs. However, this requires the involvement and synchronization of tasks at the respective centers responsible for the qualification of patients, implantation of the devices, preparation of drug solutions, refilling of pumps, and providing other treatment to ITDDS patients.

Platelet Rich Plasma in mechanic pain treatment as a regenerative method

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Platelet-Rich Plasma (PRP) is obtained from the patient's autologous blood by centrifugation and concentration, resulting in a high concentration of platelets (PLT), growth factors, and other active molecules. These agents play an important role in tissue repair and regeneration. With proper preparation and appropriate conditions of use, PRP is an effective therapeutic option for osteoarthritis and tendinopathies associated with mechanical pain. The available literature contains a large number of studies confirming the effectiveness of PRP as well as an equal number of papers denying the effectiveness of this method. The assessments of the method's efficacy are influenced by several very important aspects. Patients should be properly prepared, having abstained from non-steroidal anti-inflammatory drugs (NSAIDs) and steroids for a minimum of 7–14 days before the procedure. NSAID inhibits PLT activity thus inactivating the blood product. Preparation of PRP requires centrifugation of an adequate volume of blood so that the minimum number of platelets in the delivered dose is at least 10 billion delivered in a single injection or in 3 divided injections at two-week intervals. Determination of the quantity of blood required from the patient requires the determination of the patient's platelet counts. Assuming the baseline level of 250,000 PLT/μL and the 100% platelet recovery, the required volume of whole blood to be drawn amounts to a minimum of 40 mL. Since the average platelet recovery rate is about 60%, the minimum quantity of autologous blood necessary for collection amounts to 50–60 ml. An additional aspect that determines the effectiveness of the method consists in the leukocyte content of the plasma. We distinguish between leukocyte-poor plasma (LP-PRP) and leukocyte-rich plasma (LR-PRP), the use of the former being indicated in osteoarthritis while the use of the latter being indicated in various types of tendinopathies and enthesopathies.

FRIDAY, OCTOBER 18TH 2024

SESSION: Treatment of Patients with Headaches – Session under the auspices of the Section for the Study and Management of Pain of the Polish Neurological Society

Chairman: Adam Stępień,
Izabela Domitrz,
Jacek Rożniecki

Current migraine treatment standards

Adam Stępień
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Migraines are one of the most common neurological diseases that cause disability, which has a huge impact on the quality of life of patients. The Global Burden of Disease Study published in 2016 revealed that about 14.4% of the world's population suffers from migraines. In Poland, over three million people are affected by the disease. The introduction of new drugs with high efficacy, good safety profile, and a beneficial treatment method has changed the approach to migraine therapy. The need to update current recommendations is a consequence of this progress. According to the current guidelines, all migraine patients should receive acute treatment to ensure rapid, effective, and reliable relief from pain and relief of co-occurring symptoms, with minimal side effects. The use of preventive therapies currently depends on both the frequency of migraine attacks and its impact on the patient's quality of life. Newly registered drugs, such as monoclonal antibodies directed against the CGRP receptor and ligand (anti-CGRP mAb) and gepants, have upended the classic methods of treating migraine and can be used both in episodic migraine with frequent attacks and in chronic migraine. Acute treatment is still based on the use of NSAIDs or triptans, and paracetamol is also effective in the treatment of mild attacks. They are first-line drugs for patients who do not have any contraindications to their use. Treatment success is dependent on administering an appropriate dose of the drug at the beginning of a migraine attack. Gepants are recommended in case the treatment is ineffective or in case of severe migraine attacks. These drugs are CGRP receptor antagonists. Ergotamine and its derivatives are less effective than triptans, and due to their non-selective, although specific, effects, they cause more adverse reactions, mainly in the central and peripheral circulatory system; ergotamine preparations are used with decreasing frequency. Prophylactic treatment is recommended for patients with episodic migraine with frequent attacks, i.e. more than three attacks per month. New prophylactic drugs for the treatment of migraine, such as gepants and anti-CGRP monoclonal antibodies, are characterized by high efficacy and a good safety profile. These drugs can be used for many months and rarely cause adverse side effects. In accordance with current national and international guidelines, we recommend that in people with migraines who require preventive treatment, anti-CGRP monoclonal antibodies be used as the first-line treatment option.

Headaches in women

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Headache is one of the most frequently reported symptoms and the main reason for neurological consultations. Headaches are more common in women than in men, although the influence of gender is different in different disease entities. Some spontaneous headaches, such as migraine, tension-type headache, and chronic paroxysmal hemicrania, occur much more frequently in women. Each type of headache requires separate examinations and establishment of a correct diagnosis. Headaches are diagnosed according to the diagnostic criteria of the third edition of the International Classification of Headache Disorders (ICHD-3). Primary, or spontaneous, headaches are a large group of disorders of unknown etiology, not being symptoms of other diseases. Secondary headache is a symptom of a specific disease or syndrome, and is therefore referred to as symptomatic headache, for example in the course of inflammatory diseases, vascular diseases, cancer, trauma, poisoning, or even mood disorders. Spontaneous headaches are much more common on the population scale than symptomatic headaches. Certain periods in a woman's life predispose female patients to changes in the frequency of certain types of headaches. Pregnancy, puerperium, and the breastfeeding period may favor the subsidence or, on the contrary, exacerbate some spontaneous headaches. These periods are also associated with predisposition to disorders such as eclampsia or venous sinus thrombosis, in which headache is one of the leading symptoms. Differential diagnosis of headaches is very important during these periods as therapeutic management is sometimes limited. Headaches, especially migraine-type headaches, may also be most common during menstruation and menopause. Hormonal fluctuations during puberty, pregnancy, and menopause, as well as the use of oral contraceptives, are known to predispose patients to exacerbation of pre-existing migraine headaches or the triggering of new migraine episodes.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Neuromodulation In Pain Medicine – Session of the PASP, the Polish Neuromodulation Society and the London Pain Forum*

Chairman: Ilona Obara,
Jose de Andres,
Robert Levy

Mechanisms of Spinal Cord Stimulation: What did We Learn from Preclinical Studies?

Ilona Obara
School of Pharmacy and Translational and Clinical Research Institute, Newcastle University, Newcastle upon Tyne, UK

Spinal cord stimulation (SCS) has been successfully used for managing neuropathic pain unresponsive to pharmacotherapy and other less invasive interventions for over 50 years. Since the first successful SCS therapy in 1967, the field has evolved through technological development which has improved the effectiveness and broadened the indications of SCS. However, not all individuals benefit from SCS, and the therapy has recently faced scepticism. Moreover, despite the important advancements achieved in over 30 years of preclinical SCS research, significant challenges remain concerning the translatability of these findings to the clinic and much of the available literature refers to poorly identified mechanisms of SCS action.

This presentation will refer to Melzack and Wall's Gate Control Theory of pain processing as the foundation of SCS therapy and will provide an overview of the putative mechanisms agreed upon in the SCS field, primarily focusing on modulation of neurotransmitters, such as the release of intracellular gamma-aminobutyric acid (GABA) or the facilitation of descending inhibition involving serotonergic mechanisms. The audience will also learn about recent innovations, in both the preclinical and clinical settings concerning in vivo electrophysiological recordings. Such recordings can confirm the activation of spinal structures and potentially aid in the identification of mechanisms underlying effective SCS therapy. Specifically, this presentation will explain how evoked compound action potentials (ECAPs) have been successfully used as an objective measure to quantify the effect of SCS in terms of neural activation of dorsal column fibres, as they represent the summation of action potentials generated from the activated fibres. Thus, the audience will learn about the utility of automated feedback control in SCS to better exploit its mechanisms.
In summary, this presentation will provide an overview of how clinical outcomes align, or not, with pre-clinical research approaches in the context of understanding underlying mechanisms of SCS-induced analgesia.

Updated practice of Neurostimulation based on the new trends and knowledge in science

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Advances in our knowledge of the physiology of pain transmission and modulation have created new options for the control of chronic pain using electrical neuromodulation. Spinal cord stimulation (SCS) is the most common mode of neuromodulation used in managing chronic low back pain.
SCS involves the placement of electrodes in the posterior epidural space aimed at the dorsal columns of the spinal cord (SC), and connected to a subcutaneous implantable pulse generator. Although, in recent years we have been learning about the mechanisms by which neurostimulation inhibits pain and induces neuroplasticity, our knowledge is far from complete and broad enough to understand everything that happens in each patient. But also, we do not know why there are different results from one patient to another, and why the different levels of pain control and satisfaction generated.
If anything has made us improve our knowledge, it has been the joint application of basic science concepts, which go beyond the simple clinical application of the SCS system based on its recognized indications. The new knowledge of both macroscopic and microscopic anatomy, together with neurophysiological research of both the mechanisms involved and the genomic expression generated, have allowed us to understand much more the individuality of the therapy.

The basic scientific background of the initial SCS trials was based on the gate control theory of Melzack and Wall [1]. Using gate control theory as a starting point, the concept of interaction of multiple neural circuits was subsequently described [2]. Therefore, the surrounding inhibition of the receptive fields, the complexity of the microcircuits related to the classification of neurons and the progressive loss of the inhibitory mechanisms, are part of the evolution of knowledge in the physiology involved in the pain control mechanism. mediated by SCS [3–6]. Various other mechanisms, which may play a significant role in the mechanism of action of SCS, include the suppressive effect on tactile allodynia, increased dorsal horn (DH) inhibitory action of gamma-aminobutyric acid (GABA), prevention or abolition of peripheral ischemia, and effects on human brain activity. In man, SCS may effectively abolish both continuous and evoked pain (tactile/thermal allodynia) whereas induced, acute nociceptive pain is unaffected. SCS studies performed on rat models of mononeuropathy have demonstrated a preferential effect on A beta fiber mediated functions, and the hyperexcitability of wide-dynamic-range DH neurons was attenuated [7]. These effects were coupled to increased release of GABA and reduced glutamate and aspartate release in the DH. Intrathecal administration of GABA, baclofen and adenosine enhanced the SCS effect on tactile allodynia even in previously non-responsive rats. Preliminary results indicate that gabapentin may have a similar effect. GABAergic and adenosine-related mechanisms conceivably represent only examples of a number of putative receptor systems involved in SCS [3, 4, 7–11].
Added to the neurophysiological complexity is the difficulty in selecting the ideal candidate patient for a successful implant. For this reason, an SCS implant has traditionally been proposed in two phases, with a test phase that would allow the analysis of those patients who would benefit from the permanent implant [12–15].
Analysis of this phase of testing has shown drawbacks, such as false-positive and false-negative results, that can lead to long-term treatment failure. These results, and others such as the significant decrease in the efficacy of SCS implants in the following 4 years, and the percentage of patients who use the implant long-term have questioned the usefulness of the trial phase in selecting the appropriate patient, for the permanent implant [13–17]. This leads us to think that other patient characteristics should be considered to better assess the eligibility of patients for CSS. In addition to the difficulties in the initial selection of patients and the predictive analysis of the trial phase, which undoubtedly impact on the results in the middle and long term, the rate of explants is one of the most important concerns, in the analysis of suitability of implanted candidates. In a study by Patel et al. [18], the main reason for the removal of the hardware was the lack of effectiveness of the stimulation (81%), and in the study from Teton et al. [19], the percentage of patients still using SCS therapy decreases by almost 15% every 5 years. In this sense, Goudman et al. [13] suggested that the individual goals of patients and their level of satisfaction regarding compliance might significantly affect the SCS therapy and its outcome.

In the last decade, the improvement in the knowledge of the functional brain circuits of chronic pain has achieved a more precise diagnosis, and with it more appropriate individualized therapies. In this sense, Functional Magnetic Resonance (fMR) studies have shown a positive association between the duration of pain and brain alterations. Furthermore, concomitant studies of fMRI and morphometric MRI have established that patients with chronic pain present functional and structural brain alterations. From the analysis of the neural circuits involved in the integration of pain, the aim is to extract predictive imaging biomarkers capable of determining the characteristics of patients that can predict the success of SCS implants [20–24].

Genetic markers are a novel area of research which attempts to understand the origin of many different diseases and improve the treatments offered to patients, with encouraging results. Recent literature shows changes in the relative expression of genes and proteins in peripheral blood mononuclear cells (PBMC) of patients with chronic pain treated with SCS, as potential biomarkers of the therapy outcome [25]. Lind et al. [26] noted alterations in 86 proteins with the use of an SCS. The most relevant of these altered proteins were gelsolin, clusterin, VEGF, angiotensinogen, amyloid β A4 protein, apoprotein E, apoprotein C1, DKK3, mimecan and secretogranin 1. Other studies have also suggested that vascular endothelial growth factor (VEGF) levels decrease in patients with neuropathic pain when the SCS is on [27]. In addition, SCS treatment leads to increased local spinal production of neurotransmitters, including serotonin, substance P, acetylcholine, glycine and GABA, with simultaneous decreases of amino acids glutamate and aspartate [26]. Both GABA and VEGF seem to have a key role in patients with neuropathic pain who are implanted SCS, given that responders showed significantly decreased levels of postsynaptic intracellular $GABA_A$ [27].

Computational modeling has helped advance the technical aspects of SCS and improve the mechanistic understanding of the therapy and to evaluate the neural activation generated and hence the pain relief achieved. These models evaluate the direct effects of stimulation on neuronal activation or recruitment. In addition, the analysis of the variations in the electric field, as a result of the design and location of the electrodes, waveform/stimulation polarity and stimulation configuration, allows the evaluation of changes in neural activation thresholds [28–31]. Specific 3D models allow choosing the best stimulation parameters to optimize neural activation and SCS therapy. Electrode-dura mater distance, dorsal cerebrospinal fluid (CSF) thickness, and CSF diameter are the anatomical parameters that most affect, stimulation predictions. The addition of parallel compensated electrodes, electrode polarity planning to optimally stimulate the patient's painful dermatomes, are elements to improve outcome, which today we must implement in our decision-making for the management of patients with pain and SCS therapy [30, 31].

The aim of my lecture, is to emphasize all the new tools that the clinician must manage both in the selection decision of the ideal candidate for SCS, the implantation of the system and its programming, as well as for the optimized management that ensures optimal outcome in the long term [32]. This predictive medicine concept, as a synergistic approach, intended to help implanters optimize their clinical choices in daily practice.

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Ultrasound-Guided Peripheral Neuromodulation and Vagus Nerve Stimulation

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Ultrasound-guided peripheral neuromodulation (USgPN) and vagus nerve stimulation (VNS) are two emerging techniques in the management of various neurological and pain-related disorders.

USgPN utilises ultrasound to precisely target peripheral nerves, enhancing the safety and efficacy of neuromodulation therapies. By providing real-time visualization, it minimizes complications and allows for more accurate nerve stimulation, offering a significant advantage over traditional blind techniques. It also helps the clinician to utilise the various neuromodulatory techniques from minimally invasive to invasive methods with precision.

VNS, on the other hand, modulates autonomic and central nervous system functions through indirect and direct stimulation of the vagus nerve, showing promising results in the treatment of conditions such as chronic pain, epilepsy, depression and autoimmunologically-mediated medical conditions and pain.

Recent advances have highlighted the role of these modalities in both clinical practice and research, underscoring their potential to revolutionize the treatment of conditions ranging from migraines to inflammatory diseases. In this lecture I will discuss the principles of ultrasound guidance, the mechanisms of neuromodulation, and the current and future applications of USgPN and VNS, providing a comprehensive overview of their therapeutic potential in modern pain medicine.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Cannabinoids In Pain Medicine – Session of the PASP and the International Cannabinoid Research Society (ICRS)*

Chairman: Katarzyna Starowicz,
Jan Dobrogowski,
Michał Graczyk

Cannabinoids – the good, the bad and the ugly

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In 2022, the global cannabis market was valued at USD 43.72 billion, with strong growth projections over the coming years. The high demand for cannabis is largely driven by medicinal use, which has gained widespread support, boosted by a growing trend of decriminalization. This popularity is partly attributed to increasing acceptance among patients and an expanding body of scientific research emphasizing its therapeutic benefits in pain management, psychiatry, neurodegenerative disorders, and cancer treatment.

Despite this, opinions among experts on the actual health benefits of cannabis-based medications remain highly divided. Much of the skepticism stems from the considerable variability among cannabis-based drugs, as each has its own unique efficacy and safety profile. Comprehensive regulations governing cultivation, distribution, and marketing play a pivotal role in ensuring standardization, promoting Good Manufacturing Practices (GMP) certification, and supporting consistent therapeutic outcomes while minimizing the risk of unexpected side effects. However, the standardization of cannabis-based drugs should not lead to an overemphasis on isolating familiar active compounds like CBD or THC alone. Cannabis sativa contains over 100 active molecules, each of which exhibits unique effects and works synergistically, a phenomenon referred to as the "entourage effect". This complexity must be considered when evaluating the clinical significance of cannabis-based treatments, particularly when pure extracts of CBD or THC fail to demonstrate meaningful clinical improvements.

While preclinical research on cannabis is abundant, clinical practice guidelines are predominantly shaped by data from clinical studies. This often creates challenges when translating these findings into real-world practice. Despite some cannabis-based drugs showing limited improvement for conditions like pain, questions remain regarding the rigor of study designs, the appropriateness of measurement tools, and the influence of the placebo effect, which may obscure the true benefits of cannabis-based therapies.

Role of Acylethanolamines in inflammation, pain and affective comorbidities

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Pain and inflammation are protective responses designed to prevent and resolve noxious stimuli. However, prolonged responses can exceed the limits of physiological control and become destructive. Chronic pain and neuroinflammation are critical components of the pathophysiology of neurodegenerative diseases, stroke, spinal cord injury, diabetes, and neuropsychiatric disorders. Natural mechanisms, including the production

of lipid mediators, constitute an endogenous protective process and resolution program stimulated and triggered by tissue damage or inflammation. Lipid mediators include N-acylethanolamines (NAEs), such as palmitoylethanolamide (PEA), an endocannabinoid-anandamide congener that has been shown to have neuroprotective and anti-inflammatory properties activated in several pathological conditions. PEA does not bind to classical cannabinoid receptors but indirectly stimulates cannabinoid action. However, its anti-inflammatory and analgesic effects have been linked to the activation of peroxisome proliferator-activated receptor-α (PPAR-α). Exogenous PEA administration requires parenteral administration due to its lipid structure. Micronized and ultramicronized formulations allow oral administration, increasing the versatility, ease, and compliance of administration in clinical studies. Thus, the beneficial effects of m- and um-PEA on inflammatory and neuropathic pain as well as neuroinflammation have been investigated in several animal models of chronic pain and neurodegenerative disorders and in clinical studies.

Cannabinoid stewardship in clinical practice – Israeli perspective

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Cannabis has been utilized for therapeutic purposes for millennia; however, the medical-legal framework governing its use has undergone significant transformations over the past decade. An increasing number of patients are seeking cannabis as a viable therapeutic option for a range of medical conditions. The use of cannabis within the medical context exists within a socio-cultural-legal framework that integrates historical and extrinsic factors, influencing the perceptions of both patients and healthcare providers.
Notably, cannabis is one of the few medications prescribed by the medical community without having undergone rigorous evaluation through evidence-based medicine or formal drug approval processes. Consequently, there exists a profound gap in the literature pertaining to the understanding of cannabis products currently consumed by patients. The existing research on chronic pain in relation to cannabis is often contradictory and lacks clarity, as many studies inadequately define the specific types of pain being addressed or fail to provide details regarding the underlying causes and characteristics, such as the type, amount, and concentration of cannabis products used.
Moreover, there is a notable absence of studies assessing the long-term safety of cannabis treatments.
Israel has established itself as a frontrunner in the global domain of medical cannabis research and implementation, underpinned by a combination of progressive legislative frameworks, pioneering research initiatives, and a well-structured healthcare system. The inception of Israel's medical cannabis program dates back to the 1990s, and it has since progressed to encompass a comprehensive regulatory framework that governs the cultivation, distribution, and medicinal use of cannabis.
Despite Israel's status as one of the highest per capita consumers of medical marijuana, many of the over 140,000 licensed medical users face escalating costs, increasing bureaucratic hurdles, and challenges in accessing their prescribed cannabis. In response Israel's Ministry of Health has initiated reforms aimed at streamlining regulations, enhancing production oversight, and delegating greater responsibilities to cannabis cultivators.
It is posited that the advancement of real-world evidence data collection processes, which includes detailed knowledge of the chemical inputs used by patients on medical cannabis therapy, is essential for facilitating targeted clinical decision-making.

Practical aspects of the use of cannabis in pain management – a Polish perspective

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Cannabis indica arouses vivid interest among millions of people worldwide, often polarizing opinions into two opposing extremes. Although many countries are liberalizing cannabis policies, including the decriminalization and legalization of recreational marijuana, the stance on the therapeutic use of cannabis remains divid`ed globally. At least 30 countries, including Poland, have introduced legal acts allowing the use of cannabis or cannabinoids for the treatment of specific conditions. Patients around the world are increasingly interested in cannabis as a potential treatment option, which has led healthcare professionals to seek guidance on this issue. Medical cannabis is gaining an increasing number of supporters, attracting the interest of researchers and healthcare professionals, with thousands of patients currently being treated with cannabinoid-based products. Among all ailments, pain is one of the most commonly reported symptoms and the primary reason for their use. This is supported by data reported by patients as well as observations by therapists. Additionally, patients use them for increased muscle tension, anxiety, depression, various inflammatory conditions, or to alleviate nausea and vomiting during cancer treatment. The growing number of people using cannabis for health purposes, along with the changing policies in various countries regarding its use for medical and recreational purposes, highlights the need for research that will, ideally, definitively confirm or refute the currently available evidence. This is particularly important in countries like Poland, where we are still learning to use cannabinoids and gaining experience, especially regarding the potential risk factors associated with their use, which may arise from improper methods of administration, failure to consider contraindications, multimorbidities, and potential drug interactions. An analysis of prescription data for THC-containing products in Poland shows a threefold increase year on year.
It should be noted that cannabinoids cannot be "overdosed," which is due to the small number of CB receptors located in the brain areas responsible for breathing. There are no

documented deaths resulting solely from the overdose of cannabis used for medical purposes, taking into account all the factors described above.
Given that opioid use has become a social problem in many countries (the opioid crisis) and the number of deaths related to it is steadily rising, cannabinoids could represent a promising alternative to opioid analgesics and other medications used in pain management. Cannabinoids delay the development of opioid tolerance and may alleviate symptoms related to dose reduction or withdrawal (withdrawal symptoms). They modulate pain perception in a complex manner, through multiple signaling pathways. The combination of opioids and cannabinoids leads to an accumulation of the analgesic effect in patients with chronic pain and allows for a reduction in opioid doses by as much as 40–60%. It is important that when selecting CBD, CBG (which have the status of dietary supplements in Poland), and THC products, we consider their form and route of administration, taking into account the patient's capabilities and preferences.
Another challenge in our country has become the amendment of the regulation on prescribing narcotic drugs, psychotropic substances, or precursors of category 1. The shape of this regulation is undoubtedly influenced by the public opinion-driven belief that opioids, particularly fentanyl, are an escalating health and social problem. The restrictions imposed by the proposed regulation may become a barrier to optimal treatment of chronic pain and indicate not only opioid-phobia. "Medical marijuana" was not included in the original draft of the regulation, and thus was not properly evaluated during public consultations. Before cannabinoids gained supporters for their medical use, we have already begun to set them on the same path as opioids, and we risk contributing to the rise of cannabinoid-phobia. What a shame, as it is a good complement to the standard therapies used in symptomatic management.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Neuromodulation In Pain Medicine – Session of the PASP, the Polish Neuromodulation Society and the London Pain Forum*

Chairman: Teodor Goroszeniuk,
Christopher Chan,
Dmitry Kruglov

Neuromodulation Implants for Abdominal Pain

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Abdominal pain could be transferred via sympathetic (from viscera), somatic (from abdominal wall) pathways or both. Spinal Cord Stimulation helps alleviate chronic neuropathic pain of visceral and somatic origin. Selection of patients is a key to success in neuromodulation and correct diagnosis is the first step. The diagnosis is made upon the patient's history, physical examination and diagnostic injections. These include thoracic differential epidural and abdominal sympathetic (splanchnic nerve) block. We use CT-guided techniques for safety and efficiency. Our pathway includes multidisciplinary assessments followed by abdomino-pelvic pain management programs. Once patient's preparation is satisfactory, we do a temporary trial of neuromodulation aiming to predict long term positive outcome. Full implant is suggested when a trial outcome meets sufficient criteria. In this talk I will explain the neuromodulation pathway for patients with neuropathic pain in their abdomen and I will discuss potential mechanisms of pain relief.

Non-invasive stimulation for abdominal disorders

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Gastrointestinal motility disorders account for more than 40% of patients seen in gastroenterology and surgical clinics and affect 20% of the population. These diseases include dysphagia, gastrointestinal reflux disease, functional dyspepsia, gastroparesis, intestinal pseudo-obstruction, postoperative ileus, irritable bowel syndrome (IBS), constipation and faecal incontinence.
The aim of electrical therapies and neurostimulation/neuromodulation is to improve smooth muscle, enteric nerve, autonomic nerve function and central neural mechanisms. This may result in enhanced contractions, normalisation of propagating waves, improved sensorimotor mechanisms, sphincter function and that of the accommodating organ. There is also evidence to show that neuromodulation can also influence inflammatory conditions in the GI system. Neuromodulation can also benefit functional abdominal neuropathic pain.
Well-established neuromodulation techniques for abdominal disorders include the Sacral Nerve Stimulation (SNS) and Percutaneous Tibial Nerve Stimulation (PTNS) for faecal incontinence and bladder dysfunction and vagal nerve stimulation (VNS) for irritable bowel syndrome (IBS). Initial techniques were invasive or minimally invasive. More recently, there is a growing number of reports in the literature regarding successful non-invasive applications for especially in VNS and TNS.
Recent pilot studies and a subsequent larger trial of external stimulation for constipation/evacuatory dysfunction in children have been very promising. The non-invasive bioelectric neurostimulation for multiple painful abdominal conditions and for functional disorders is not only economical but uncomplicated. Nonetheless, more studies are required to determine optimal stimulating parameters and duration of application. This presentation will include current and novel future external peripheral neuromodulation approaches and therapies.

Non-invasive neurostimulation of the sphenopalatine ganglion: a novel approach for intractable primary headache

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Background and aims: The sphenopalatine ganglion (SPG) is a well-described therapeutical target to treat primary headaches (migraine, tension headache, cluster headache, and other primary headache disorders). Until recently, electrical neurostimulation of the SPG required invasive approaches. We described here a case series of non-invasive intranasal neurostimulation of the SPG.
Methods: Patients with primary headache disorders and failed multiple pharmacological treatments were selected for low-frequency intra-nasal non-invasive neuromodulation of the SPG, using the Remedius ExStim neurostimulator and Remedius nasal catheter (10-minute weekly session, frequency of 2 Hz and amplitude determined by feedback from the patient of a comfortable pulsing sensation felt over the temporomaxillary region of the face).
Results: 26 patients (21F/5M, mean age 49) were enrolled: 12 migraines, 6 tension headaches, 3 cluster headaches, and 5 other primary headache disorders. The mean duration of symptoms was 15 years. The average number of sessions was 5. Changes from baseline to post-treatment scores were respectively 0.225 to 0.864 for EQ-5D-5L index and 14.3 to 86.5 for EQ-5D-5L VAS. The EQ-5D-5L index at the latest follow-up (mean duration of 72 months) was 0.855.
Patient global impression of changes (PGIC) at the latest follow-up was 7 in 12 patients, 6 in 7, 5 in 3, 4 in 2, and 3 in 2 patients (mean PGIC 6.5).
Conclusion: The case series corroborated the efficacy of a new non-invasive neurostimulation approach targeting the SPG for management of refractory primary headaches. Quality of life and PGIC were drastically improved and maintained over time.

Stimulation of the sphenopalatine ganglion in neuropathic trigeminal neuralgia

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Introduction: Stimulation of the sphenopalatine ganglion (SPG) has been recognized as an attractive treatment for headaches of autonomous etiology. The purpose of this study was to evaluate the responses to invasive SPG stimulation in patients with neuropathic trigeminal neuralgia.
Material and methods: Included in the study was a group of five patients with chronic neuropathic neuralgia (4 women and 1 man, mean age 55 years, range: 34–68 years). The patients suffered from chronic pain refractory to conventional treatment, lasting an average of 6 years (range: 2–11 years) and involving areas innervated by the V2, V3, or V1 branches with a history of surgeries, microsurgical decompression or shingles (*herpes zoster*) infection.
Surgeries were performed under general anesthesia. A percutaneous electrode was inserted into the pterygoid fossa under neuronavigation. After a trial stimulation period, a pulse generator was implanted within a subcutaneous pocket in the subclavian region.
Results: All patients achieved excellent scores on the NRS scale, with improvements of more than 50%. In one case, implantation had to be repeated due to electrode migration. In another case, an additional electrode was percutaneously implanted to stimulate the supraorbital nerve in order to cover the area of pain.
Conclusions: The preliminary results of SPG stimulation in neuropathic trigeminal neuralgia are promising. SPG stimulation may be an attractive alternative to other neuromodulatory treatments, such as peripheral nerve stimulation, cerebral cortex stimulation, or deep brain stimulation in cases of chronic facial pain.

The application of tDCS (transcranial direct current stimulation) in patients with chronic pain

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Chronic pain is a major challenge in the work of the clinician. We are constantly looking for new methods of treatment and ways to individualize therapy. Neuromodulation – both invasive and non-invasive – is becoming an increasingly popular alternative and/or adjunct to pharmacological methods. Methods for non-invasive central stimulation – the transcranial direct current stimulation (tDCS) and repetitive transcranial magnetic stimulation (rTMS) are gaining on popularity. The tDCS is a non-invasive technique based on the emission of low-intensity electric current across two electrodes placed on the skull. It is most commonly used to stimulate areas identified as being involved in the processing of pain stimuli – the primary motor cortex (M1) and the dorsolateral prefrontal cortex (DLPFC), although more evidence suggests the superiority or the anode being placed at the M1 site. The flow of the current between the anode and the cathode results in changes in neuronal excitability; positive effects on neuroplasticity are also suggested.
A total of 37 patients with neuropathic and nociceptive pain were enrolled in the study, with 27 completing the cycle as of the time of writing the manuscript. On the basis of literature data, the chosen regimen consisted in 20-minute cycles of stimulation with a 2mA current administered once a week, for 10 weeks, with the anode located in area M1. Patients were randomly assigned to the group receiving stimulation or placebo (device in sham mode). No serious adverse effects

were reported for the therapy, with some local discomfort being the main complaint. After the series of stimulations, a decrease in NRS by an average of 2 points was obtained in the treatment group, accounting for a significant difference compared to the placebo group. The results so far suggest positive effects of tDCS as one of the potential treatments for neuropathic and nociceptive pain.

Funding: The survey was conducted as part of the university's statutory activities (own research).

FRIDAY, OCTOBER 18TH, 2024

SESSION: Acute pain management

Chairman: Jerzy Wordliczek,
Hanna Misiołek,
Renata Zajączkowska

Relieving labor pain – state of art

Paweł Krawczyk
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The presentation will discuss the pharmacological methods of labor analgesia performed by anesthesiologists. Epidural anesthesia is one of the most effective forms of pain relief during labor. The currently recommended doses and concentrations of the most commonly used local anesthetics and adjuvants will be discussed. Modern methods of drug delivery for epidural anesthesia using infusion pumps will also be presented. Alternatively, other types of central blocks can be used depending on the clinical situation: combined spinal-epidural anesthesia or, in justified situations, spinal anesthesia alone. The current state of knowledge regarding the perinatal administration of remifentanil to relieve labor pain will also be presented. Although epidural anesthesia is more effective compared to remifentanil administration, the use of remifentanil is an increasingly common alternative procedure. This occurs not only in cases of contraindications to a central block, but more increasingly as the procedure of choice for women in labor. Aspects of the safety of remifentanil administration and the proposed treatment protocol will be discussed.

Perioperative management of patients chronically treated with opioids

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Chronic opioid therapy patients are at an increased risk of complications and elevated perioperative morbidity and mortality. Scientific studies confirm that chronic preoperative opioid use in surgical patients raises the risk of:

- delayed wound healing and infectious complications,
- respiratory failure, pneumonia, and the need for prolonged ventilation,
- opioid-Induced Bowel Dysfunction,
- reoperations,
- prolonged hospital stays,
- hospital readmissions.

The most serious life-threatening complication, respiratory depression, which occurs in 0.15–1.1% of all surgical patients, is three times more likely during the perioperative period in patients treated chronically with opioids.

This patient population often exhibits altered nociception, which must be considered in perioperative management strategies. These patients have been shown to have reduced pain tolerance and increased pain sensitivity. Additionally, they frequently experience anxiety, depression, and catastrophic thinking, all of which are associated with a higher risk of opioid misuse.

Opioid-treated patients often fear:

- inadequate postoperative pain management,
- development of withdrawal symptoms due to improper care.

Awareness of these concerns highlights the need for extra attention during the perioperative period, with careful planning and communication with the patient. Preoperative measures should include optimizing pain management, gathering detailed information on chronic opioid use (including daily doses), evaluating concurrent medications (for pain management and comorbidities), and identifying risks for drug interactions. Detailed histories of alcohol use, smoking, and other substances should be obtained.

The patient should be presented with a precise, individualized management plan that includes a description of pain assessment methods and postoperative pain management, with strong recommendations for multimodal analgesia incorporating regional anesthesia techniques, combined pharmacotherapy, and continuation of chronic opioid therapy (to prevent withdrawal symptoms). If a change in the administration route of the chronically used opioid is necessary, a rotation scheme to another opioid should be developed, considering equianalgesic doses. Kindness and understanding are crucial, along with psychological support if needed, and in the case of particularly difficult patients, consultation with a pain management specialist is recommended.

Intraoperatively, the chronic opioid should be continued at preoperative levels, with the application of multimodal analgesia strategies, including regional anesthesia techniques (central nerve blocks, peripheral nerve blocks, fascial plane blocks, or infiltration anesthesia), combined pharmacotherapy with non-opioid analgesics (paracetamol, metamizole, nonsteroidal anti-inflammatory drugs), and co-analgesics (IV lidocaine, ketamine, dexamethasone, magnesium sulfate, dexmedetomidine). Additional opioid doses should be tailored to the clinical situation.

Postoperatively, systematic pain intensity assessment and monitoring of therapy safety are crucial (due to the threefold higher risk of respiratory depression). Effective analgesic management must continue, utilizing continuous regional anesthesia techniques, combined pharmacotherapy, and the patient's chronic opioid regimen, with the option of additional opioid doses, preferably through a patient-controlled analgesia (PCA) system. It is important to remember that,

particularly in cases where regional analgesia is ineffective, opioid requirements may be higher in this patient group compared to opioid-naive patients, with a significantly higher risk of adverse effects, including respiratory depression. In subsequent days, when the patient's condition permits, regional anesthesia techniques and parenteral opioids should be gradually reduced in favor of oral or transdermal opioid administration. A gradual opioid dose reduction plan should be developed with the patient, while monitoring for inadequate pain control, withdrawal symptoms, and opioid overdose.
Before discharge, an evaluation of the effectiveness of the pain management strategy should be conducted, and a written treatment plan should be provided, listing all prescribed medications, their dosages, duration of use, and the opioid dose reduction plan, if applicable. It is recommended to coordinate care with the patient's preoperative physician to ensure continuity of care, providing the patient with a sense of support and security.

FRIDAY, OCTOBER 18TH, 2024

SESSION: Interdisciplinary management of rheumatological patients

Chairman: Mariusz Korkosz,
Marcin Siwek,
Marek Kowalczyk

Inflammatory pain or nociceptive pain

Mariusz Korkosz
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Pain in the musculoskeletal system is a common primary ailment in chronic rheumatic diseases. An analysis of the pain's location, its characteristics, and physical examination provide valuable information about the possible etiology or source of pain and are therefore significant components of the preliminary differential diagnosis of rheumatic diseases. In inflammatory rheumatic diseases, we encounter inflammatory pain associated with local and systemic inflammation, while in degenerative diseases, we encounter nociceptive (mechanical) pain related to damage to joints and periarticular tissues. Nevertheless, in osteoarthritis, we often see secondary inflammation, which is local and mild. The characteristics of pain in these two groups – inflammatory and degenerative – differ, e.g., in the duration of morning stiffness, the occurrence of pain at rest, the presence of general symptoms, etc. At an early stage of inflammatory rheumatic diseases, some patients, such as those with rheumatoid arthritis (RA), experience pain without accompanying joint swelling. We classify these cases as clinically suspected arthralgia and monitor them for potential development of arthritis. The occurrence of pain preceding synovial membrane inflammation is associated with the presence of anti-citrullinated peptide autoantibodies (ACCP), which can appear up to 10 years before full-blown RA symptoms manifest. One of the goals of treating rheumatic diseases is to reduce pain or achieve complete relief. In inflammatory diseases, we use medications with anti-inflammatory potential (NSAIDs, glucocorticoids, disease-modifying antirheumatic drugs, biologics, and targeted synthetics) – which reduce pain by inhibiting inflammation. In contrast, in degenerative diseases, we use analgesics with or without anti-inflammatory potential. In both cases, we can employ a combination therapy with multiple medications, intra-articular and periarticular steroid injections, physiotherapy, and other methods. The aim of pain treatment is to maintain the functional ability of the joints and improve the quality of life of patients.

Diagnostic process and treatment of fibromyalgia – patients' perspective and needs

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Fibromyalgia causes significant suffering and significant limitation of physical and mental functioning of affected individuals [1]. Fibromyalgia contributes to disability in everyday activities, as well as dysfunctions in close relationships and social roles [2] and professional work [3], often contributing to loss of employment [4]. Scientific data from studies in other countries indicate that people with fibromyalgia undergo long-term diagnostic processes, experience invalidation of their symptoms, doubt about whether they make adequate efforts to improve their health, suffer from ineffective treatment attempts, and feel that they are blamed for the unsuccessful therapy [5]. In addition, it has been reported that patients find it difficult to organize the course of their disease and assign the significance of individual symptoms to the discomfort resulting from fibromyalgia, and that they are ambivalent towards the diagnosis itself, doctors, and pharmacotherapy [6, 7]. So far, no data has been published on patients' experiences with the diagnosis and treatment of fibromyalgia in Poland. This paper will present the original results of a study conducted by a team from the Department of Affective Disorders of the Jagiellonian University Medical College in cooperation with the Department of Rheumatology and Immunology of the Jagiellonian University Medical College, concerning patients' experiences with the diagnostics and treatment of fibromyalgia. The issues of difficulties in contact with medical personnel, factors determining satisfaction with treatment or lack thereof, assessment of the impact of individual fibromyalgia symptoms on the daily functioning and level of suffering of patients, as well as declared preferences for therapeutic methods will be discussed.
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Myorelaxants in pain medicine

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Centrally acting skeletal muscle relaxants (myorelaxants) are a heterogeneous group of substances with different chemical structures and mechanisms of action, but similar clinical effects. They are commonly used to treat two different types of conditions:
Spasticity due to central nervous system (CNS) disorders, such as spasticity observed in the course of multiple sclerosis, spinal cord and brain damage, cerebral palsy, or neuromotor diseases;
Pain and contraction of skeletal muscles caused by disorders of the musculoskeletal system and peripheral nervous system – for example, in the course of fibromyalgia, myofascial pain, acute and chronic musculoskeletal pain syndromes (acute sacroiliac pain).
Myorelaxants such as baclofen, tolperisone, botulinum toxin, tizanidine, pridinol, and diazepam have found their use in typical spasticity caused due to CNS disorders. The treatment of painful muscle spasms caused by pathologies within the musculoskeletal system (e.g., acute sacroiliac pain, myofascial pain) involves e.g. the use of methocarbamol, thiocolchicoside, prydynol, and tizanidine, all of which have appropriate registration in their respective SPCs. In medical practice, myorelaxants can be used both in monotherapy and in combination therapy with analgesics.
Globally, myorelaxants are among the most commonly prescribed medications for patients with musculoskeletal disorders presenting with muscle spasms and pain, although evidence of their efficacy in these diseases is very limited. Other problematic aspects consist in the off-label use and the increasing percentage of patients, including elderly patients, receiving chronic myorelaxant treatments of > 14 days for chronic pain syndromes.
The largest number of clinical trials have examined the use of myorelaxants in patients with acute sacroiliac pain. According to systematic reviews and meta-analyses, only low-level evidence is available for the efficacy of myorelaxants in this pain syndrome, with recent meta-analyses recommending that myorelaxants should not be used as first-line drugs in patients with acute sacroiliac pain; instead, they should be used as second-line therapy, possibly for a short time (less than 2 weeks) when non-pharmacological methods and monotherapy with NSAIDs have proven ineffective.
Myorelaxants differ in their mechanisms of action, pleiotropic effects, CNS and gastrointestinal safety, risk of drug-drug and drug-disease interactions, and the potential for use in specific clinical situations, e.g. neuropathic pain, topical use, etc. No clear evidence is available on the superiority of any myorelaxant over another with regard to their pain-relieving effects, so the choice of a particular drug should be individualized and based on the known safety profile, risk of interactions, duration and severity of pain, expected benefits, comorbidities, and treatment costs.

SATURDAY, OCTOBER 19TH, 2024

SESSION: Chronic Pelvic Pain (CPP) – Multidisciplinary Aspects

Chairman: Małgorzata Malec-Milewska,
Agnieszka Sękowska

Pelvic pain syndrome – introduction

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Chronic pelvic pain (CPP) is a chronic pain located in the lower abdomen, lasting at least 6 months, which may be accompanied by pain in the mid-abdomen, epigastrium, perineum (anal or vulvar area) and/or pain in the lower limbs. Pain symptoms are periodic or constant, irregular in intensity, and lead to a significant deterioration in the quality of life. Chronic pelvic pain affects 5.7–26.6% of women of reproductive age and 2–10% of men (some sources report 9–14%). Over 80% of patients experience pain for more than a year before seeking medical attention, and about 1/3 for more than 5 years.
The etiology of chronic pelvic pain has not yet been clearly explained. It has a very complex pathomechanism. Important factors determining its occurrence are inflammatory mediators and immunological factors, contraction of the uterine fundus muscles, vascular mechanisms, hormonal factors, and genetic factors. Causes should be sought in many systems and the following should be taken into account:
gynecological (endometriosis/adenomyolysis, pelvic congestion syndrome, uterine fibroids, adnexal tumors, pelvic inflammatory disease, postoperative or post-inflammatory adhesions),

- surgical (chronic appendicitis, postoperative adhesions),
- urological (chronic cystitis, interstitial cystitis, urolithiasis, chronic prostatitis, neoplasms),
- gastrointestinal (irritable bowel syndrome, constipation, ulcerative colitis),
- neuromuscular (degenerative changes, neuropathies, herniation of the nucleus pulposus, nerve compression, pudendal neuralgia),
- psychosomatic (depression, sleep disorders, neurotic disorders, migraine with abdominal symptoms, history of sexual assault).

The cause of pain cannot be determined in 30–40% of patients despite diagnostic tests. In these cases, functional pain

syndromes are taken into account: fibromyalgia, pain of the perineum and anus, irritable bowel syndrome, vulvodynia.
Risk factors for the occurrence of CPP include: dysmenorrhea in women under 30 years of age, body mass index (BMI) < 20, menarche before the age of 12, prolonged or irregular menstrual bleeding, history of pelvic inflammatory disease, previous cesarean section, history of miscarriages, symptoms of premenstrual syndrome, reported sexual assault, alcohol and opioid analgesic abuse, cigarette smoking, mental illness (e.g. depression, anxiety disorders, neurotic disorders).
The process of diagnosing CPP is very difficult. This is due to the variety of potential anatomical sources of pain, the possibility of the coexistence of many causes, and the dependence of pelvic pain on psychological and emotional factors. Diagnosing CPP should be a multidisciplinary process and require consultations with many specialists. It is important to determine definite causes of the symptoms, allowing the implementation of targeted treatment, or to make a diagnosis of functional pain.

Pelvic pain in women

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Pelvic pain affects up to 25% of women of reproductive age. In different populations, the causes of pain may vary, and most women have several coexisting etiological factors. A gynaecological consultation is one of the necessary elements of diagnosis, as one in three patients may have a gynaecological cause of pain. A thorough medical history and physical examination determine further diagnostics. Unfortunately, additional tests often remain inconclusive, but they allow for the exclusion of certain organic causes. The selection of these tests is individualized.
The medical history should focus on the relationship between pain and the menstrual cycle, sexual intercourse, pregnancy, childbirth, triggering factors, and the impact of pain on the aforementioned aspects. The gynaecologist rules out or treats inflammatory causes, pelvic changes such as tumours, changes related to endometriosis, and pelvic organ statics disorders. During a gynaecological examination, non-gynaecological causes, such as pathologies of the lower gastrointestinal tract or lower urinary tract, may also be suspected, guiding further diagnostics. An important element is functional diagnostics aimed at identifying abnormal tension in the pelvic floor muscles. Iatrogenic pelvic pain in women after gynaecological surgeries is a common cause of chronic complaints. It is crucial to qualify the type and scope of the planned procedure, taking into account preoperative pain complaints, biopsychosocial factors, age, and patient expectations. These criteria are key risk factors for the occurrence of chronic pelvic pain syndromes in women.
In the majority of patients, the aetiology of chronic pain is multifactorial. For example, in 75% of women with endometriosis, at least one additional etiological factor causing pain complaints coexists. Hence, multidisciplinary care is essential, in which the gynaecologist is one of the links in the diagnostic-therapeutic chain leading to an accurate diagnosis and effective treatment.

Endometriosis – A Diagnostic and Therapeutic Challenge – 1 in 10 Women

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Endometriosis is one of the most common causes of chronic pelvic pain. This is a chronic inflammatory condition characterized by the presence of glandular tissue similar to normal endometrium and/or its stroma outside its intended location – the uterus. It affects approximately 10% of women of reproductive age, and its complex symptoms and diagnostic challenges often lead to a significant delay in proper diagnosis, sometimes up to 7–12 years. Although endometriotic lesions are most commonly located in the pelvic region, they can also occur throughout the peritoneal cavity and even outside of it, leading to a wide variety of symptoms. The most frequent symptoms include painful and heavy menstruation, periovulatory pain, dyspareunia, dyschezia with symptoms resembling irritable bowel syndrome (IBS), dysuria, and overactive bladder-like symptoms (OAB), as well as a range of pain radiating to the lumbar spine, groin, and lower extremities. Another important symptom is infertility, affecting around 50% of women with endometriosis.
The pathogenesis of endometriosis is not fully understood and leads to three types of lesions-superficial, deep, and ovarian (cysts). Each type contributes to the development of symptoms through different mechanisms. Regardless of their location, endometriotic lesions produce cytokines, prostaglandins, and other inflammatory mediators, which result in chronic inflammation, local neuroangiogenesis, and adhesions. The local inflammation irritates nerve endings, generating neuropathic pain, and the chronicity of this process leads to central sensitization, intensifying existing symptoms and causing pain in areas not directly associated with endometriosis. Concurrent structural changes in the pelvis, such as endometriotic cysts (known as "chocolate cysts" in the ovaries), deep infiltrative lesions affecting the intestines, bladder, or pelvic wall, can further exacerbate symptoms through mechanical compression and deformation of affected organs. The intensified process of adhesion formation additionally restricts the mobility of organs, causing mechanical pain.
Due to the often nonspecific symptoms and sometimes latent nature of the lesions, diagnosing endometriosis remains a significant challenge. A detailed medical history, thorough gynecological examination, and pelvic ultrasound are key elements of the diagnostic process, which can be supplemented by magnetic resonance imaging (MRI).
The treatment of endometriosis usually begins with pharmacotherapy, physiotherapy, and dietary therapy. If these approaches do not provide satisfactory results, surgical interventions, typically laparoscopic procedures, are considered. The choice of treatment method and scope should always

be individualized based on the severity of the disease, the intensity of pain symptoms, and the patient's reproductive plans. A multidisciplinary approach is required in the therapeutic process, where anesthesiologists play a key role with their expertise in pain management.
Understanding the mechanisms of pain in endometriosis and current therapeutic strategies is crucial for improving the quality of life of affected patients.

SATURDAY, OCTOBER 19TH, 2024

SESSION: Integrative Pain Medicine*

Integrative East-West Medicine as a Model to Solve Multiple Health Crises

Ka-Kit Hui
UCLA Center for East-West Medicine, USA

Optimal health care that is effective, safe, accessible and affordable should become the priority of every country's health care system. This task will require the concerted efforts, ingenuity and collaborative spirit of the scientific and medical communities, policy-makers, the public and visionaries of all segments of society. Some of the health care resources have to be shifted somehow from high-tech, invasive, crisis intervention to patient-oriented care, prevention, early disease recognition and health promotion. Other healthcare approaches, such as traditional Chinese medicine should be incorporated, in order to create a more balanced health care system.
Integrative medicine or health should be embraced by everyone earlier so that people can know and use this approach at home and take care of themselves when disease trajectories are still early. One should assess every situation with this knowledge in mind so that one can navigate between the East and the West and best orchestrate the use of both at the different stages of one's life span. In general, we may benefit from acute management offered by modern biomedicine when the body is overwhelmed and when the body parts are badly damaged, but we can also get the benefits of integrative medicine for both health cultivation/prevention and treatment.
We hope that our innovative person-centered integrative health model can be more broadly disseminated globally to make healthcare to be affordable, accessible, as well as safer and more cost-effective for all; traditional Chinese medicine, an ancient treasure, can be better appreciated and its value can be more beneficial to a larger population in the modern world; and through our collective efforts to improve health from the perspective of body-mind-spirit-environment, we would ease tension among people, cultures, and countries.

Workshop: Chronic pain and related symptoms: a person-centered integrative model for the prevention and treatment

Ka-Kit Hui, Monika Rybicka

Chronic pain is a leading cause of disability and suffering worldwide. The workshop aims to open new perspectives to treatment of chronic pain through a person-centered integrative model. The model emphasizes treating the whole person with pain and not only pain as a symptom. Use of the person-centered integrative model assumes that pain is a warning sign of the body being not in balance. Thus, resolving pain with the use of this model can also help with other disabling conditions which a patient may have. The approach combines use of myofascial trigger point injection (TPI), acupuncture and lifestyle recommendations guided by Traditional Chinese Medicine principles and aims to resolve pain/related symptoms and bring the body back to balance. During the workshop, Prof. Hui and Dr. Rybicka will demonstrate using acupuncture and TPI in the treatment of neck pain, low back pain, shoulder pain, sciatica, fibromyalgia, and irritable bowel syndrome (IBS).

SATURDAY, OCTOBER 19TH, 2024

SESSION: Chronic Pelvic Pain (CPP) – Multidisciplinary Aspects

Chairman: Małgorzata Malec-Milewska,
Agnieszka Sękowska

Physiotherapy as an element of multimodal therapy in the treatment of women with chronic pelvic pain syndrome

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Chronic pelvic pain syndrome is a widespread condition affecting 8.5–15% of women of all ages and up to 12% of women of reproductive age. Patients suffering from chronic pelvic pain experience a significant reduction in the quality of life and efficiency at work, as well as a significant negative effect on social relationships. In current studies, chronic pelvic pain syndrome is classified among functional pain syndromes. Differential diagnosis can be complex and time-consuming, with access to effective therapy being significantly delayed. Physiotherapeutic perspective on the treatment of patients with CPPS is based on a correct functional diagnosis, determination of patient's pain phenotype, and therapeutic plan being developed together with the patient and other specialists. According to recent reports, the most effective therapeutic approach is geared toward multidirectional and multimodal treatment. It is important that the patient be put under the care of an interdisciplinary team consisting of a pain management specialist, a gynecologist, an urologist, a gastroenterologist, a psychologist, and a physiotherapist.

Physiotherapy in chronic pelvic pain syndrome in men

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Chronic Pelvic Pain Syndrome (CPPS) in men is defined as chronic pelvic pain developing with no apparent cause and lasting at least 3 months over the period of the last 6 months. The pain symptoms are often accompanied by urological problems and/or sexual dysfunction. Characteristically, pain

is experienced within the pelvic floor, testicles, penis, and the area between the genitals and rectum, as well as in the perianal area, lower abdomen, and groins. Patients often report recurrent pain in the urogenital area during erection as well as during or after ejaculation. Not uncommonly, abnormalities concerning urine flow such as a weaker urine stream, or the feeling of urinary retention following micturition are observed. A feeling of rectal pressure (*golf ball feeling*) is also characteristic. Of significance is the fact that the pain can worsen during prolonged sitting.
One of the methods for the treatment of chronic pelvic pain syndrome in men is physiotherapy, which should be preceded by a functional diagnosis. The latter should consist of extensive history, functional ultrasound (pelvic floor sonofeedback therapy), per rectum examination, assessment of pelvic statics, neurological evaluation, and functional electromyography. In some cases, consultations with other specialists such as urologist, neurologist, psychologist, psychiatrist, orthopedist, and/or sexologist are required.
Physiotherapeutic interventions in the treatment of chronic pelvic pain syndrome in men include working on musculofascial trigger points, peripheral manual therapy techniques (working on the pelvis, spine, abdominal fascia, peripheral pelvic muscles, gluteal muscles, lower limb muscles) as well as *per rectum* manual therapy (massage, PIR, trigger points, mobilizations). Physical therapy modalities used in the treatment include TECAR therapy, electrostimulation, and shock waves. It is also important to provide patient education and help with the choice of the right form of physical activity. As of today no single physiotherapeutic approach to a patient with pelvic pain syndrome is considered correct, requiring continuous generation and upgrading of knowledge on urological physiotherapy.
Successful physiotherapy in the chronic pelvic pain syndrome in men depends on proper functional diagnosis, and thus also on proper clinical diagnosis.

Pudendal neuralgia – diagnosis and treatment

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Pudendal neuralgia, also known as Alcock syndrome or "biker's disease," is a painful condition resulting from damage or inflammation of the pudendal nerve.
The pudendal nerve is a branch of the sacral plexus, originating from the ventral branches of the S2–S4 nerve roots. It provides sensory innervation to the skin of the perineum and the mucosa of the anal canal. It also provides motor control of the external anal sphincter, urethral sphincter, and perineal muscles. Damage can lead to pain when sitting, numbness, and hypersensitivity in the area of innervation, and can also cause problems with defecation and sexual dysfunction.
Diagnosis of this pelvic pain syndrome is difficult, given the lack of a commonly used diagnostic test. To aid in the identification of patients with pudendal neuralgia, or pudendal nerve entrapment (PNE), the Nantes criteria have been proposed, which include clinical inclusion and exclusion criteria. The core criteria include: (1) pain in the anatomical region of the pudendal nerve, (2) symptoms that worsen with sitting, (3) no pain-related night awakening, (4) no objective sensory loss on clinical examination, (5) a positive response to a pudendal nerve block. An ineffective diagnostic block does not necessarily exclude pudendal neuralgia if the nerve is anesthetized distally to the site of entrapment.
Pudendal neuralgia may be caused by mechanical injuries (e.g. falls, pelvic surgery), chronic inflammation, prolonged microinjuries (e.g. in cyclists), or prolonged sitting in one position. Treatment may include pharmacotherapy (analgesics, coanalgesics, anti-inflammatory drugs), physiotherapy, nerve blocks, neurodestructive procedures, and, in some cases, surgical interventions.
The pudendal nerve block has been used for analgesia and anesthesia during surgical procedures involving the perineum (e.g. in obstetrics). It can also aid in the diagnosis and treatment of pelvic pain syndromes, particularly pudendal neuralgia. A variety of nerve block techniques have been described, from landmark-guided approaches (the transvaginal technique – using the sciatic spine as a landmark), and the transperineal technique, to magnetic resonance neurography. The ultrasound or fluoroscopy-guided transgluteal method is one of the techniques currently used.
The latter method allows for the visualization of soft tissues while observing the inserted needle and the spread of the injected agent around the target structures. The target, at the level of the ischial spine, is the interligamentous space (between the sacrotuberous ligament and the sacrospinous ligament). The lecture will present the technique of an ultrasound-guided pudendal nerve block using a transgluteal access.

Botulinum toxin A in pelvic pain

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Botulinum toxin is an exotoxin produced by the *Clostridium botulinum* bacteria. It is a potent biological poison. Among the eight types (A–H), type A botulinum toxin is used in treatment. It has many applications, ranging from neurological disorders associated with spasticity to migraines, excessive sweating, bladder disorders, and aesthetic medicine.
Pelvic pain syndromes are still considered off-label indications. Its use in pelvic dysfunctions in women has most frequently been studied in the context of penetration disorders, vaginismus, vulvodynia, and chronic pelvic pain caused by endometriosis, with attempts at such treatment being made for many years. Several mechanisms of action of botulinum toxin are utilized. The primary mechanism involves blocking the release of acetylcholine at the neuromuscular junction. When administered intramuscularly, it reduces excessive tension in the pelvic floor muscles, eliminating this factor, which is present in approximately 70% of patients with chronic pelvic pain – as a primary or secondary factor contributing to other mechanisms that exacerbate pain. At the molecular level, botulinum toxin acts as a neurotransmitter through several

pathways, causing desensitization of nerve fibres along the afferent pathway. It also enhances activity through the epithelium, for example, in bladder symptoms via NGF.
Botulinum toxin therapy yields very promising effects, is safe, and relatively easy to apply. Despite numerous positive observations, it has not yet been standardized, and the literature is heterogeneous, requiring further randomized studies.

Regional anesthesia techniques and neurolytic block of ganglion of Walter for pain management in patients with chronic pelvic pain

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Chronic pelvic pain (CPP) is a chronic pain located in the lower abdomen, lasting at least 6 months, which may be accompanied by pain in the mid-abdomen, epigastrium, perineum (anal or vulvar area) and/or pain in the lower limbs. Pain symptoms are periodic or constant, irregular in intensity, and lead to a significant deterioration in the quality of life. The incidence of CPP in women is 4–14% and 10% in men. The pathophysiology of CPP is very complex and not fully understood, which is why it is included in the so-called functional pain syndromes, i.e. ones where treatment aimed directly at the cause cannot be applied due to their unknown pathophysiology. The causes of CPP may be chronic prostatitis, irritable bowel syndrome, interstitial cystitis, endometriosis, pelvic inflammatory disease, adhesions, pelvic congestion syndrome, myofascial pain, vulvodynia, pudendal neuralgia. Treatment of pain in each pain syndrome should be causal if possible, however, in almost 30–40% of patients with CPP, a specific cause of pain cannot be found. Gabapentinoids and antidepressants are used in the pharmacological treatment of CPP. Invasive treatment methods are also used, such as peripheral nerve blocks and stimulations, as well as neurolytic blocks of the superior abdominal plexus and Walter's ganglion. In the lecture, I present two studies in which invasive pain treatment methods contributed to a reduction in pain. In the first study, Walter's ganglion block was used in the treatment of CPP (9 patients, in whom a total of 16 Walter's ganglion neurolysis procedures were performed – the patient cases spanned a period of 4 years), and in the second study, a pudendal nerve block and Walter's ganglion neurolysis were used in women who suffered pain due to endometriosis and in whom the possibilities of gynecological treatment had been exhausted (18 cases spanning 5 years). In the first study, all the examined patients achieved a statistically significant pain relief of 4–5 points on the NRS, which was assessed 30 days after Walter's ganglion neurolysis. The positive effect lasted from 4 weeks to 3 years. The relief of symptoms was permanent in 4 patients. In the second study, only one patient (out of 18) did not achieve a reduction in pain. Complete relief of constant and paroxysmal pain was achieved in 6 patients. The elimination of paroxysmal pain and reduction of constant pain to the level of NRS = 1–3 was achieved in 7 patients, and in 3 patients only a reduction of paroxysmal pain was achieved.
Noninvasive neuromodulation of the pterygopalatine ganglion: an innovative approach for treatment-resistant headaches.

Pharmacological treatment of pelvic pain syndromes

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The optimal treatment of chronic pelvic pain should be causal. However, the causes of pain are unknown or do not decrease after targeted therapy in 30–40% of cases. When choosing the right method, the following factors should be considered:
- type (pathomechanism) of pain,
- age of the patient,
- comorbidities,
- concomitant pharmacotherapy,
- history of any past adverse drug reactions.

Pharmacotherapy of CPP may consist of antibiotics (they should only be used when clinical and/or laboratory signs of infection are present), selective α1-adrenergic receptor blockers, hormonal therapy, anti-inflammatory drugs, and muscle relaxants.
The standard of care in the treatment of any chronic pain is a strategy of treatment in accordance with the three-step WHO analgesic ladder, which systematizes the use of painkillers according to the level of pain experienced. In the case of inflammatory pain, it is advisable to administer a nonsteroidal anti-inflammatory drug. Opioids are indicated as last-line drugs, after exhausting other possible treatments. Serious adverse effects remain a significant factor limiting the use of these drugs. Thus, opioids are used almost exclusively in pelvic pain of neoplastic origin. Opioids should not be used in patients with functional pain.
Due to the nature of pain in the course of CPP, co-analgesics (antidepressants and anticonvulsants) play an important role. Selective serotonin and noradrenaline reuptake inhibitors (SNRIs) and tricyclic antidepressants (TCAs) are drugs with proven efficacy in cases of pain with a neuropathic or neuroplastic component. They are particularly valuable in the case of concomitant depressive mood disorders, which often occur in people affected by chronic pain syndromes. However, the use of antidepressants that act only on serotonin (selective serotonin reuptake inhibitors, SSRIs) should be avoided. Serotonin has analgesic effects only at the level of the central nervous system, while peripherally it is one of the mediators of inflammation. The use of SSRIs may therefore intensify the symptoms. The antidepressants used in CPP are duloxetine, venlafaxine (>150 mg/day), milnacipram (not available in Poland), amitriptyline. Vortioxetine is a promising drug that is gaining importance in the treatment of neuropathic pain – it is a modulator of serotonergic receptor activity and an inhibitor of serotonin transporter activity. Drugs with established efficacy in the treatment of neuropathic pain also include gabapentin and pregabalin – epileptic drugs,

centrally acting analogues of gamma-aminobutyric acid (GABA). Their mechanism of action involves binding to the α2-δ subunit of the G protein of the voltage-regulated calcium channel, which reduces the depolarization-induced influx of calcium ions into neurons and the release of excitatory neurotransmitters. Mirogabalin also shows promise for future therapy. This is a new drug with a similar mechanism of action to gabapentin and pregabalin, but with greater selectivity in binding to calcium channel subunits. It is characterized by higher affinity and slower dissociation than the α2-δ1 subunit of the calcium channel, which translates into a better analgesic effect. Additionally, it is characterized by a more favorable safety profile and a lower incidence of adverse effects, such as drowsiness, headaches and dizziness.
If the aforementioned treatments are ineffective, invasive procedures are used depending on the suspected cause of the symptoms.

SATURDAY, OCTOBER 19TH, 2024

SESSION: Lifestyle *vs*. Pain*

Chairman: Bart Morlion,
Barbara Przewłocka

Diet and Pain

Bart Morlion
University of Leuven, Belgium

Pain is a multifaceted phenomenon that involves the complex interplay of biological, psychological, social, and cultural factors. Given its complexity, modern pain management adopts a multimodal approach, which not only includes medical and pharmacological interventions but also incorporates non-drug treatments such as psychological support, physical activity, and rehabilitation. A holistic approach to pain often involves lifestyle modifications, including nutritional interventions, recognising the potential role of diet in managing pain.
Considering the opioid crisis, there has been a growing interest in exploring herbs and spices as non-opioid alternatives for pain relief. Nutrition plays a significant role in pain management by affecting pain in various ways. Poor nutritional habits or deficiencies can be a direct cause of certain pain syndromes. For instance, neuropathic pain can arise from nutritional deficiencies, while metabolic disorders are known to contribute to painful neuropathies. Malnutrition and cachexia may result in pain due to poor wound healing and the development of pressure sores. Furthermore, being overweight or obese is strongly linked to musculoskeletal pain and a higher prevalence of chronic pain conditions.
Throughout history, certain diets and nutrients have been recommended for pain relief. Some, such as capsaicin and menthol, are well-studied and are used in clinical settings to alleviate pain. However, much of the scientific scrutiny around nutritional strategies for pain management has only emerged in recent decades. Culinary medicine, which integrates the therapeutic use of food into healthcare, is gradually gaining recognition in medical schools as a strategy for both disease prevention and management.
Recent research highlights the role of diet-induced neuroinflammation in contributing to both acute and chronic pain conditions, such as neuropathic pain. Pro-inflammatory cytokines and oxidants produced at sites of nerve injury are believed to sensitise nociceptors, leading to heightened pain sensitivity, or hyperalgesia. Several nutrients have been studied for their potential to reduce oxidative stress and inflammation, which are key contributors to chronic pain. Examples of these include omega-3 polyunsaturated fatty acids, turmeric, verbena, cinnamon, willow bark, and green tea, which have shown promising results in limiting pain through their anti-inflammatory properties.

Sleep and pain

Vinko Palada
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Sleep disorders are a common comorbidity in painful conditions and often not sufficiently treated as part of the pain management. The relationship between sleep and pain is bidirectional since insufficient sleep can precede and maintain pain while pain can impair one´s ability to initiate and maintain sleep. In this talk, we will explore the relationship between sleep and pain both in clinical cohorts and experimental models and will evaluate the effects of commonly used analgesics on the quality of sleep.

Turning the enemy into an ally – unveiling the role of the histamine H_3 receptor in the pursuit of new analgesics

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Besides its well-known role as a peripheral mediator of immune, vascular, and cellular responses, histamine plays a crucial role in the central nervous system (CNS), particularly in regulating sleep and wakefulness. Moreover, there has been a particular increase in evidence to support the involvement of histamine H_3 receptor (H_3R) in the modulation of neuropathic pain, which remains challenging in management. However, the mechanism of action of H3R in pain is still unknown. There is one clinically used drug and the first marketed H_3R antagonist/inverse agonist, pitolisant (Wakix®, Ozawade®), which is successfully used in human therapy for adults suffering

from narcolepsy with or without catalepsy and Obstructive Sleep Apnoea (OSA). In February 2023, pitolisant received its first approval in adolescents and children for the treatment of narcolepsy in the EU.

Our study aimed to determine the analgesic potency of a pitolisant, and novel H_3R antagonist/inverse agonist, E-98 [1-(7-(4-chlorophenoxy)heptyl)-3-methylpiperidine)], in a preclinical model of neuropathic pain (CCI, chronic constriction injury of the sciatic nerve model) in mice. The impact of H_3R antagonists/ inverse agonists on mechanical (von Frey) and thermal (cold plate) stimuli was investigated. The compounds were injected intraperitoneally (i.p.) in a single (1, 5, 10, and 20 mg/kg) paradigm. Moreover, the effect of chronic E-98 (10 mg/kg, i.p.) treatment (twice daily, for 7 days, from day 7th after CCI) on pain symptoms was performed. Additionally, to deepen our knowledge of the histaminergic system, we have also performed immunohistochemical staining to examine the presence of H_3R within the spinal cord of control and neuropathic animals. Moreover, we assessed the influence of E-98 on glial cells (microglia and astrocytes) activation within the lumbar spinal cord.

The H_3R antagonist, E-98, attenuated nerve injury-induced hypersensitivity in a dose- and time-dependent manner. Chronic treatment with E-98 also revealed a time-dependent analgesic effect, correlated with reduced microglial and increased astroglial cell activation within the lumbar spinal cord. Moreover, our preliminary data have shown dose-dependent profound analgesia after pitolisant treatment. Our immunofluorescence studies revealed the co-localization of H_3R with neurons, microglia, and astrocytes within the lumbar spinal cord of naïve and neuropathic animals. Our study results help to investigate the mechanism of action of H_3R antagonists/inverse agonists in pain, pointing to glial cells as a potential target of action, in addition to neurons. Furthermore, our studies point to the histaminergic system as a new target for pain management strategies in humans.

Funding: Work was financed by a grant from the National Science Centre, Poland, SONATA 2019/35/D/NZ7/01042, SONATINA 2020/36/C/NZ7/00284, and Jagiellonian University – Medical College in Kraków grant no N42/DBS/000386.

Chronic pain and obesity: interdependence and mechanisms predisposing to their occurrence

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Obesity is one of the most progressive diseases of civilization. According to the World Health Organization (WHO), at least 39% of the world's population is overweight and 13% is obese. Epidemiologically, obesity is strongly correlated with pain and exacerbates chronic pain conditions, including neuropathic pain – in obese patients, the risk of chronic pain is almost twice as high as in people with a normal BMI. Neuropathic pain resulting from damage or improper functioning of nervous tissue is often resistant to treatment, which is why new therapeutic strategies that take into account its etiology and gender differences are urgently needed. Therefore, our research focuses on determining the mechanisms associated with the development of hypersensitivity in obesity and determining molecular targets for effective pharmacotherapy.

To compare the behavioral and biochemical profile of changes in obesity in animal studies, a genetic model of obesity (ob/ob mice; LepKO) was used. Weight measurement, blood glucose level, and behavioral tests to assess mechanical (von Frey test) and thermal (cold plate test) hypersensitivity were performed between 6 and 15 weeks of age in male and female mice. Biochemical analysis of mice's blood and spinal cord was subsequently performed to assess the profile of molecular changes induced at the tissue and cellular level.

As our results indicate, genetically obese animals, despite being fed a standard diet, gained weight, which correlated with the development of mechanical and thermal hypersensitivity observed in both sexes. From the 10th week of life of the mice, there was a significant increase in pain symptoms, which deepened with age and body weight gain. In addition, it was observed that the standard diet promotes a decrease in blood glucose in obese female mice, but not in males. In the mice's blood collected at 16 weeks of age, a significant increase in leukocytes, erythrocytes, and hemoglobin was observed in obese females, and ACTH in both sexes. In the spinal cord collected at the same time, a significant increase in the level of IL-1β mRNA and a decrease in POMC were observed in both sexes of LepKO mice. Moreover, only in obese female mice, there was a decrease in the level of CCL3, IL-18, and MC4R mRNA observed.

The obtained results allow us to indicate the direction of further research aimed at explaining the biological mechanisms of the development and maintenance of chronic pain in obesity, with particular emphasis on the opioid-melanocortin-leptin pathway and the immune system. The presented results and further research in this area are of fundamental importance for the development of targeted pain therapy in obese people and for breaking the stagnation in the development of effective methods of treating chronic pain.

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* The session was conducted in English.

Note: The journal's editorial staff has only standardized the form of the presented materials and is not responsible for their content.

9th Polish Association for the Study of Pain Symposium – "Advances in pain management"

POSTER ABSTRACTS

Complex Rehabilitation for Pain Relief in Patients with CRPS Type 1

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The international clinical guidelines for the management of complex regional pain syndrome (CRPS) recommend a wide range and variety of rehabilitation therapies.
Objective: The main objective of the study was to evaluate the effectiveness of comprehensive rehabilitation using the *Neuroforma* functional rehabilitation system for the relief of pain in patients with type 1 CRPS involving the upper limb.
Methods: The study group consisted of 11 patients with type I CRPS. Patients had been previously diagnosed on the basis of the Budapest criteria, and had been screened for neuropathic pain using the painDETECT scale. Patients were also assessed using the McGill Pain Questionnaire (MPQ), and the visual analog scale (VAS). Patients were subjected to rehabilitation management consisting of manual therapy techniques, kinesitherapy, electrotherapeutic treatments and balneotherapy. Eight patients were assigned to a group treated using a comprehensive upper limb rehabilitation module for the biofeedback-based *Neuroforma* system. Three patients were assigned to a group receiving treatment without the use of the *Neuroforma* device.
Results: Six of the eight participants and one of the three participants who completed the study reported subjective improvements in pain and daily function. The mean VAS pain scores after rehabilitation in the first group were lower than in the group treated without the use of biofeedback. The reduction in average pain intensity in the first group was 2.5±0.8 points as compared to 1.7±0.7 in the second group.
Discussion: The use of biofeedback can provide subjective pain improvement, reduced pain ratings in chronic arm pain, and functional improvement in selected patients with complex regional pain syndrome affecting the upper limb. Our study provides preliminary data on the feasibility of biofeedback in the treatment of CRPS, although further, more extensive studies are needed to better understand the potential and limitations of this treatment.

Personalized pain management in children related on an example of a case report

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Introduction: A 17-year-old male patient with the recurrence of osteosarcoma – status after treatment completed 12 years before – presented with an upper mediastinal tumor infiltrating the right lung and the Th3 vertebra, compressing and displacing the spinal cord at Th2–Th4 level. Symptoms included Horner's syndrome, profuse sweating, significant weight loss, hoarseness/voicelessness, scapular and right shoulder pain (NRS 7/8). Non-opioid analgesics and morphine as delivered in intravenous (iv) boluses proved to be of little effect. The summoned Pain Management Team (PMT) recommended iv infusions of lidocaine and PCA morphine (2 mg/kg/hour, bolus 2 mg) and gabapentin. The treatment resulted in an analgesic effect of NRS 2/3. Primary treatment as established by a multispecialty medical team included steroid therapy, chemotherapy, laminectomy at the Th2 level. Following the surgery for spinal cord decompression, the patient presented with sensory and motor disturbances below Th4, flaccid paralysis of lower limbs, disturbed peristalsis, and severe pain in the left buttock and the right shoulder (NRS 8–10). Pain therapy was modified to include morphine PCA (iv) – 5 mg/kg/hour, pregabalin instead of gabapentin, and lidocaine infusion, resulting in an analgesic effect of NRS 4. Myelomalacia at the Th2 level was found in MRI scans. After a few days, the patient started to experience rectal and anal pain (mainly on defecation) and paroxysmal (occurring several times/day) piercing pain in the limbs, mainly on the right, burning and stabbing with muscle spasms visible as extension of fingers – NRS 10, baseline pain NRS 4/5. As the psychological state of the child and caregivers deteriorated, they started to strongly voice their desire to continue therapy and care at home. The treatment was modified by the PMT so as to prepare the patient for discharge and included oral targin (up to 140 mg/day), intranasal fentanyl (FNT) (100–200 µg/dose)

in breakthrough pain, pregabalin, paracetamol/pyralgin/ketonal, duloxetine (instead of Asentra), lamotrigine. Gradual discontinuation of lidocaine was initiated. Epidural block was performed to allow full, pain-free bowel movements (18 times on the first day) and reduce FNT and targin doses. The treatment resulted in stationary pain at NRS 2/3, with breakthrough pains (less frequent) at NRS 6. Chemotherapy proved ineffective. After 2 months of hospitalization, the patient was transferred to the care of Home Hospice (HH) and referred to the Pain Management Clinic (PMC). As part of the care provided by the University Children's Hospital in Kraków (UCHK), 4 more central blocks were performed during half-day stays, and cannabinoid therapy (dry cannabis herb vaporization) was started, resulting in reduced frequency of rescue FNT administration. Spectacular improvement in analgesia (almost complete withdrawal of FNT) and the child's quality of life was brought about by the inclusion of hemp oils as part of the PMC treatment.
PMT Objectives: 1. Pain control. 2. Pain management adapted to the home environment. 3. Control and supervision of the implemented treatment. Meeting the objectives was made possible by interdisciplinary, multi-specialist collaboration including the UCHK, HH, and PMC staff: I. Patient and parent education. II. Medical staff education. III. Pharmacotherapy: . Wide range of pain medications and adjuvants. 2. Conversion of intravenous drugs to oral and intranasal preparations. 3. A series of central blocks. 4. Cannabinoid therapy. 5. In-house training in new therapeutic approaches. IV. Rehabilitation: 1. Implementation of the physician's and physiotherapist's recommendations. 2. Neurorehabilitation. 3. Physical therapy. 4. Occupational therapy. V. Psychology: 1. Psychological and spiritual support. 2. Education and behaviors to enhance acceptance and motivation. VI. Other non-pharmacological interventions: 1. Home care options. 2. Realization of dreams (skydiving). 3. Continuing school education. 4. Sleep hygiene. 5. Social life and peer support. 6. Charitable actions.
Results: 1. Improved quality and dignity of life for the patient and their family. 2. therapy and supervision in an outpatient setting. 3. Survival – 20 months from hospital discharge. 4. Gratitude and appreciation for the work and commitment of the medical staff by the patient's parents.
Conclusions: A holistic, i.e. multidimensional, multimodal, and interdisciplinary approach that takes into account the broad context and covers all aspects of the life of the patient and their family are prerequisites for optimum, personalized, pediatric patient-centered therapy.

Knowledge of nursing staff on the treatment and monitoring of acute pain in children – results of a survey

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Introduction: In October 2022, the Pain Management Team (PMT) was established at the University Children's Hospital in Kraków (UCHK); at the same time, a new standard operating procedure titled "Assessment, Monitoring, and Treatment of Pain" (OP6/LO-A-1) was introduced in the institution.
The PMT has provided intensive training to the UCHK medical staff regarding the current recommendations for pain management as specified in the OP6/LO-A-1 procedure and the current guidelines from scientific societies [2], while simultaneously overseeing the implementation of the new medical-organizational standards.
Following approval from the UCHK Management and the Jagiellonian University Bioethics Committee, a survey was conducted in May 2023 to shed light on the results of the Pain Management Team activities to date.
Objective:
1. To assess the knowledge of the principles for pediatric pain management and monitoring and the knowledge of the OP6/LO-A-1 procedure among the nursing staff.
2. To identify the need for further training.

Method: Participation in the study was voluntary and anonymous. Survey questions had been formulated on the basis of current guidelines for acute pain relief in children [2]. The results of the survey were presented in percentage grades. The knowledge assessment criteria were defined as follows:
- ≤ 60% – insufficient,
- 61–75% – sufficient,
- 76–90% – good,
- ≥ 91% – very good.

Results:
1. Included in the analysis were the responses of 135/194 (69.6%) nurses from the following departments:
   - intensive care (ICD) 60/61 (98.4%);
   - operating room and post-operative ward (OR/POP anesthesia nurses) 29/44 (65.5%);
   - surgery 23/57 (40.4%);
   - neurosurgery 16/17 (94.1%);
   - orthopedics 7/15 (46.7%).
2. The knowledge of the existence of the OP6/LO-A-1 procedure was declared by 94.1% of respondents while 96.3% of respondents declared being aware of the ongoing training in pain therapy and monitoring.
3. The training courses as organized by the PMT (01.10.2022–31.03.2023) had been attended by 65.2% of the respondents; willingness to participate was declared by 68% of the remaining group.
4. The opinion that the training had improved their knowledge of pain therapy was shared by 83% of respondents, while 86.7% expressed the opinion that the training should be delivered on a periodic basis.
5. Keeping the documentation of pain intensity assessments was declared by 94.1% of respondents, with 54.8% using more than one scale to assess pain.
6. The reporting of the side effects of therapy was declared by 85.2% of respondents.
7. In the respondents' self-assessment, their knowledge of pain monitoring and therapy was:

- insufficient – 3.7%,
- sufficient – 23.7%,
- good – 63.7%,
- very good – 5.2%.

8. The objective evaluation results were as follows:
- insufficient – 8.1%,
- sufficient – 17.0%,
- good – 61.5%,
- very good – 13.3%.

Conclusions: Intensive training as delivered during the first six months of PMT's operation contributed to a high level of knowledge of the UCHK's standards for pain management and educational opportunities on the topic among the nursing staff. The survey showed a good level of knowledge of pain therapy among nursing staff while pointing to the need for further continued training.

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Quadratus lumborum block (QLB) in pain management of a patient with advanced atypical lung carcinoid – case study

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Background: Pain in advanced cancer affects up to 70–80% of patients, most of whom require multimodal management, including pharmacotherapy combined with other interventions. The purpose of this study is to present the case of a patient with advanced lung carcinoma, in whom improved pain control and reduced escalation of opioid therapy were achieved following the QLB.

Material and method: A case report of a 72-year-old patient with disseminated (pleural, thoracic lymph nodes) atypical carcinoid of the lung having remained under the care of the Center for Pain Management and Palliative Medicine since July 2023. Status post extensive surgical treatment, tumor recurrence, numerous courses of chemotherapy and radiotherapy; the patient is currently undergoing radioisotope and somatostatin analog therapy. History of numerous unsuccessful attempts to control pain with opioid drugs (tramadol, buprenorphine, morphine, oxycodone) in combination with gabapentin in a 200–0–300 mg dosage regimen.

Case description: Patient with chronic burning pain in the anterior part of the chest on the right side (NRS 4–5; DN4 – 4 points), most severe around the post-thoracotomy scar. In addition, episodes of spontaneous or movement-provoked breakthrough pain (NRS 8–9) in the region of the right lower back, radiating to the right groin (2–3 times/day, duration about 5–15 minutes) significantly limiting the patient's activity – ECOG 3.

The patient was offered a fentanyl patch with a gradual dose escalation to 50 µg/h, gabapentin in a 300–300–300 mg regimen, duloxetine 30 mg in the morning, topical ointment with lignocaine and 2% gabapentin on the scar area, intranasal fentanyl 50 µg as a rescue treatment in cases of severe pain up to 3 times/day. The treatment resulted in a reduction in neuropathic pain (NRS 2) and satisfactory control of the breakthrough pain (NRS 0 at about 10 minutes after the attack). Over the following months, an increase in the number of pain episodes was observed due to the escalation of oncological treatment. In February 2024, the patient was offered right-sided QLB with 0.2% ropivacaine (30 mL) to achieve complete resolution of breakthrough pain over a period of 2 weeks with gradual recurrence of episodes in the following weeks (up to 4 times/week). An improvement in patient performance status (ECOG 2) was also achieved.

In the course of treatment to date, QLB with 0.25% bupivacaine (20 mL) was administered two more times, in May and August 2024 prior to elective oncological hospitalization.

Conclusions: The quadratus lumborum block (QLB) is an interfascial plane block frequently used in modern perioperative analgesia; in selected cases, however, it can also be delivered adjunctively as part of multimodal chronic pain management.

Innovative application of magnetic resonance image segmentation of the pelvic muscles in the diagnosis of chronic low back pain

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Objectives: Low Back Pain (LBP) is the most common musculoskeletal disorder and the leading cause of disability worldwide. Persistent pain symptoms are confirmed in 30% of patients. The introduction of "Chronic Pain" in the 11th revision of the International Classification of Diseases has resulted in changes in diagnosis and treatment approaches. There is a need to explore new diagnostic methods to support innovative solutions for chronic pain management. One such method is the morphometric assessment of the hip girdle muscles using magnetic resonance imaging (MRI) segmentation to detect symptomatic volume changes. The time-consuming nature of this assessment prompts the analysis of cross-sectional area (CSA), allowing for the method implementation in clinical practice.

The aim of the study was to evaluate the reliability of CSA measurements for detecting atrophy of the hip girdle muscles in patients with chronic LBP and healthy volunteers.

Methods: The study included 71 patients with chronic LBP and 29 healthy volunteers. Two independent researchers measured the CSA of magnetic resonance images of the gluteal muscles (maximus, medius, and minimus) of both lower limbs and the piriformis muscle. Measurements were performed using manual segmentation in ITK-SNAP 4.0 software. Active muscle tissue was calculated without subcutaneous

and intermuscular fat tissue. In patients with chronic LBP, the symptomatic side was compared to the asymptomatic side, while in healthy volunteers, the right side was compared to the left. The Mann–Whitney test, binomial test, and chi-square test were used for statistical analysis. The intraclass correlation coefficient (ICC) and concordance correlation coefficient (CCC) were used to assess the agreement of CSA measurements between the researchers.
Results: In over 50% of patients with chronic LBP ($p<0.05$), muscle atrophy was observed in the gluteus maximus, gluteus minimus, and piriformis muscles. In patients with left-sided pain, atrophy of the gluteus medius muscles was noted ($P < 0.001$). All examined muscles showed symptomatic atrophy (except for the gluteus maximus). No changes were observed in the control group. The agreement between the researchers' assessments, as measured by ICC and CCC, was >95% for each muscle in both patients and healthy volunteers.
Discussion: The measurement of the cross-sectional area (CSA) on MRI in patients with chronic low back pain (LBP) indicates atrophy of the hip girdle muscles on the symptomatic side. In contrast, no differences in muscle CSA between sides were observed in the group of healthy volunteers. This suggests that these changes are closely related to the presence of chronic LBP and are more pronounced on the pain-affected side. Furthermore, the study demonstrated high agreement between two independent raters, highlighting the reliability of the method, which appears to be a promising biomarker in the diagnosis of chronic pain.
Funding: Department of Physiotherapy, Poznan University of Medical Sciences, Poland.

Polish Adaptation of the Pain Anxiety Symptoms Scale 20: Psychometric Properties in Individuals with Chronic Pain

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Objectives: The aim of this study was to assess the psychometric properties of the Polish version of the Pain Anxiety Symptoms Scale-20 (PASS-20) in a group of individuals suffering from chronic pain. The analysis focused on content and criterion validity, internal consistency, and temporal stability of the tool.
Methods: The psychometric properties of the tool were tested in a group of individuals suffering from chronic pain, recruited through the nationwide research panel Ariadna. Participants were eligible if they met the following criteria: age over 18, fluency in Polish, and physician-diagnosed chronic pain. Of the 2,569 potential participants, 2,151 were excluded due to failure to meet at least one inclusion criterion or poor data quality (e.g., incorrect answers to validation questions). The final sample consisted of 418 participants (40% men, 60% women), aged 19 to 86 years (mean age: 49.37). As many as 80% of participants took part in the second measurement after 30 days. Confirmatory factor analysis was used to assess the fit of the factor structure. Additionally, Cronbach's alpha coefficients, item-to-item correlations, intraclass correlation coefficients (ICC), and Pearson correlation coefficients were calculated. Differences between groups were analyzed using Student's t-tests.
Results: The analysis revealed a hierarchical structure of the scale, with four first-order factors (avoidance, fearful thinking, cognitive anxiety, physiological responses) and one second-order factor (general pain-related anxiety). The resulting model demonstrated excellent fit indices: $\chi 2/df = 1.24$, NFI = 0.99, CFI = 1.00, RMSEA = 0.02. Significant correlations were observed with pain catastrophizing, depression, anxiety (both state and trait), and pain intensity. Internal consistency for the overall score was excellent ($\alpha = 0.96$), and the subscales showed good reliability. The temporal stability of the scale was also good (ICC = 0.79). Women, individuals using pain medication, those on sick leave, and individuals with activity limitations scored higher on the PASS-20 questionnaire.
Discussion: The Polish version of the PASS-20 demonstrates good psychometric properties, making it a valuable tool for measuring pain-related anxiety in patients with chronic pain in Poland. Its application in clinical practice may contribute to a better understanding of the emotional aspects associated with chronic pain, while also enabling the individualization of therapeutic strategies, which can lead to more effective treatment of patients.
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The role of state empathy in placebo and nocebo effects induced by observational learning

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Objectives: Placebo hypoalgesia and nocebo hyperalgesia can be induced by observational learning (OL), which involves observing changes in the pain experience of another person. The aim of this study was to investigate whether manipulating the level of observer empathy affects placebo and nocebo effects induced by observational learning. This is one of the first experimental studies examining the role of empathy as a state in pain modulation.

Methods: Participants were divided into four experimental groups: placebo-OL, nocebo-OL, placebo-OL with empathy induction, nocebo-OL with empathy induction, and two control groups. In the placebo-OL and placebo-OL with empathy induction groups, participants watched a video in which the model experienced less pain during placebo trials than during non-placebo trials. In the nocebo-OL and nocebo-OL with empathy induction groups, stronger pain was observed during placebo trials. Pain was induced using thermal stimuli applied to both forearms of the participant. The placebo, on the other hand, was in the form of a gel applied to one forearm. The empathy manipulation consisted of verbal instructions encouraging participants to empathize with the model's situation and experience. In the control groups, participants either observed random pain ratings by the model or did not participate in the observation. Subsequently, all participants received pain stimuli of the same intensity, both in placebo and non-placebo trials.
Results: No significant differences were observed in pain stimulus ratings between the groups. The empathy manipulation was ineffective. A three-way interaction of expectations between the group, test phase, and trial (with placebo/without placebo) was statistically significant: $F(6,352) = 5.81$, $P < .001$, $\eta p^2 = .09$. The nocebo groups expected stronger pain in the forearm with placebo, while the placebo groups expected weaker pain. Mediation analysis revealed that an increase in pain expectations in the nocebo group was associated with stronger actual pain, indicating an indirect effect of expectations on pain.
Discussion: The results of the study suggest that mere observation of changes in the pain experiences of others, or learning through observation, is not sufficient to elicit the expected effects of placebo hypoalgesia and nocebo hyperalgesia. Although a change in pain expectations was evident, it did not translate into changes in the participants' reported pain levels. Additionally, the ineffective manipulation of empathy levels means that we cannot confirm whether an increase in the observer's empathy influences placebo and nocebo effects in the context of learning through observation. These results indicate the need for further research on the role of empathy in eliciting placebo and nocebo effects, as well as the mechanisms underlying these phenomena.
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Does pain have a gender? Exploring emotional and behavioral differences in pain perception among Polish female and male medical students

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Study objective: The purpose of this study was to gain knowledge about the differences in the perception of pain by women and men, to understand how representatives of both genders feel, describe, and react to pain, as well as to identify potential factors influencing these differences. The analysis of the data obtained shall facilitate the identification of factors that affect pain perception as well as our recognition of differences in the needs and attitudes towards pain as experienced by female vs. male patients.
Methodology: A survey was conducted in a group of medical students from all over the country. It consisted of N = 111 individuals (71.2% female, 28.8% male). An online questionnaire consisting of 34 questions, including 32 closed-type questions, was used as the study tool. Incorporated within the questionnaire was a validated research tool in the form of the *Brief Illness Perception Questionnaire* (B-IPQ) scale. The responses were collected over a period of two months.
Results: This pilot study confirms the existence of gender-based differences in the perception and coping strategies used to deal with pain among medical students. Compared to men, women reported a higher frequency of pain complaints within a month. While 12.5% of male students declared having no pain complaints within the last 3 months, the percentage among female students was just over 5%. As for chronic pain, its presence was confirmed by 25% of both female and male subjects. Compared to men, women tend to delay the moment of taking painkillers, reaching for medications when experiencing pain of greater severity (NRS 6.0/5.3 for females/males, respectively). As many as 37.5% of men declared never having felt that their pain complaints were being downplayed by medical personnel, the opinion being shared by just over 27% of women. Women were more likely to report that pain complaints have a significant impact on daily functioning and more frequently lead to deterioration of their emotional condition.
Discussion: As defined by the International Society for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. Pain is a subjective experience that can be shaped by a variety of biological, psychological and social factors. As revealed by the study published in the journal *Brain* (2024), there are differences in nociceptor excitability in men and women. Prolactin increases pain receptor sensitivity in women, whereas in men, a similar effect is exerted by orexin B. The IASP published a review finding that females generally presented with lower pain thresholds and greater sensitivity to pain compared to men. This pilot study confirms the existence of gender-related differences in the perception and coping strategies in relation to pain. The awareness of these differences can have a significant impact on clinical practice, facilitating the implementation of a more personalized approach to pain diagnosis and treatment being tailored to women and men. The knowledge gained can also help improve educational programs for future physicians as well as develop more effective pain management strategies. As the year 2024 was declared the Global Year About Sex and Gender Disparities in Pain, our study adds a voice to the discussion on correlations between gender and pain experience.

Complex regional pain syndrome treated interdisciplinary, illustrated with cases of patients in University Children's Hospital in Cracow

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Complex regional pain syndrome (CRPS) is a chronic pain affecting the peripheral parts of limbs. There is no clear epidemiological data, but research publications report about 1–1.2 cases per 100 thousand children a year. It occurs most often in children over 12 years of age. The diagnosis is based on the Budapest Criteria from 2004. There are many differences in clinical symptoms in children compared to adult patients. The diagnostic process, the diagnosis itself, and the treatment require a multidisciplinary team, including orthopedists, pediatricians, rheumatologists, neurologists, physiotherapists, psychologists, psychiatrists, anesthesiologists, and pain treatment specialists. Four patients were treated at the University Children's Hospital in Krakow from May 2023 to April 2024. One of the patients had sympathetic blocks performed every month by the Pain Management Clinic team of the University Hospital in Krakow from October 2023 to May 2024. At present, the patient does not experience any pain. A sympathetic block, together with other treatments, reduces the symptoms of the disease, primarily pain, as well as allodynia and hyperalgesia. The same patient received a ketamine infusion over 48 hours in the Intensive Care Unit due to an advanced CRPS – dystonia with trophic disorders and muscle tremors. The patient also received botulinum injections in the affected limb. CRPS is challenging to diagnose, and the treatment can be lengthy and cumbersome, as exemplified by this patient case.

The effectiveness of learning procedures in reducing nocebo hyperalgesia

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Objectives: The aim of the study was to evaluate the effectiveness of learning procedures, such as counterconditioning, verbal modeling, and operant conditioning, in reducing nocebo-induced hyperalgesia caused by classic conditioning. An additional objective of the study was to determine the role of expectations and stress in the process of acquiring and eliminating hyperalgesic responses.
Methods: Participants in the study were randomly assigned to three experimental groups and one control group. In the first part of the study, individuals assigned to the experimental groups underwent classic conditioning procedures to induce nocebo hyperalgesia. High-intensity stimuli were applied when a placebo was used, while low-intensity stimuli were applied when no placebo was present. Participants in the control group underwent a sham conditioning procedure, during which they received stimuli of two different intensities both in the presence of placebo and when it was not used. The effects of the aforementioned procedures were measured by presenting participants with stimuli of the same moderate intensity, half of which were administered alongside the placebo.
In the second part of the study, individuals assigned to the experimental groups underwent various procedures aimed at reducing the previously induced nocebo hyperalgesia. In the first group, where counterconditioning was applied, stimuli of two different intensities were administered, with low-intensity stimuli presented alongside the placebo. In the second group, where operant conditioning was used, moderate-intensity stimuli were applied, and participants were rewarded for reporting mild pain (and penalized for reporting severe pain) when the stimulus was administered with the placebo. In the third group, where verbal modeling was employed, moderate-intensity stimuli were presented along with information about how other study participants rated the intensity of pain induced by each stimulus. The information presented to the participants indicated that others experienced less pain when the placebo was used compared to when the stimuli were administered without it. In the control group, half of the participants continued with the sham conditioning procedure, while the remaining participants received no interventions. The effects of the aforementioned procedures were measured by presenting participants with stimuli of the same intensity, half of which were administered alongside the placebo.
Results: The classic conditioning procedure for nocebo hyperalgesia proved effective, with a significant difference observed between the experimental groups and the control group in the pain intensity ratings experienced in trials with and without placebo [$F(1, 146) = 8.42$, $P = .01$]. Data analysis showed a significant reduction in nocebo hyperalgesia in the groups where operant conditioning ($P < .001$), counterconditioning ($P < .001$), and verbal modeling ($P < .001$) were applied. Expectations elicited through classic conditioning mediated the development of the nocebo hyperalgesia effect ($R^2 = .24$, $F(2,54) = 6.36$; $P < .01$), but did not influence the effects induced by the procedures implemented to reduce the nocebo effect. Subjective stress did not affect the observed outcomes
Discussion: This study is the first to demonstrate the effectiveness of operant conditioning and verbal modeling in eliminating nocebo hyperalgesia. It also confirmed the effectiveness of counterconditioning in eliminating nocebo hyperalgesia, as well as the mediating role of expectations in the process of acquiring placebo responses. The data obtained significantly expand knowledge about the process of placebo response development and have important clinical implications. Nocebo hyperalgesia, which is a common phenomenon in clinical practice, significantly reduces patient comfort and complicates effective treatment. As demonstrated, providing patients with positive experiences during therapy, as well as information about the positive experiences of other patients, can be an effective method for eliminating this phenomenon.
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The role of chemokines in developing hypersensitivity in a mouse model of diabetes and obesity

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Diabetic neuropathy is a chronic disease resulting from nerve damage and affects as many as 50% of people with diabetes. In turn, obesity is one of the most progressive diseases of civilization. According to the World Health Organization (WHO), at least 39% of the world's population is overweight and 13% is obese. Obesity is strongly associated with the occurrence of chronic pain, including neuropathic pain. Unfortunately, the pharmacotherapy of neuropathic pain is unsatisfactory, including the development of tolerance to the drugs used, which in consequence leads to increased doses and the occurrence of a number of adverse effects. Therefore, it is so important to understand the mechanisms that determine the development of hypersensitivity in order to develop effective pharmacotherapy with particular emphasis on its etiology and gender. According to numerous reports, immune factors, including chemokines, play an important role in chronic pain. Both chemokine receptors and their ligands are associated with the pathophysiology of the development of neuropathic pain, but their role in diabetes and obesity remains unclear. Therefore, the aim of this study was to determine the participation and role of chemokines and their receptors in a model of diabetes and obesity in both male and female mice.

The experiments were performed on male and female mice in a model of diabetic neuropathy induced by streptozotocin (STZ, 200 mg/kg, *i.p.*) and $^{ob/ob}$ (LepKO) mice with leptin deficiency in a model of genetic obesity. In order to determine the development of mechanical and thermal hypersensitivity, two behavioral tests were performed, the von Frey test and the cold plate test, respectively. In addition, the level of chemokines and their receptors in the spinal cord collected from the studied mice was determined using RT-qPCR and/or Western-blot, ELISA, Luminex.

The development of neuropathic pain symptoms was observed in both obesity and diabetes models compared to control animals. However, no differences between these models in response to mechanical and thermal stimuli were observed. Interestingly, there was increased expression of genes encoding *CCL2*, *CCL5*, and *CCL7* in the spinal cord during diabetes-induced neuropathic pain in both sexes, while in female mice increased expression of ccl8 and *ccl12* was additionally observed. Moreover, the expression of *ccr2* in males was reduced and *ccr5* in females was increased in the diabetes model compared to control animals. In obese mice, there was reduced expression of ccl3 in both sexes, while in females there was a decrease in *ccl4* and *ccr2*.

The mouse model with pharmacologically induced diabetes and the mouse model of genetic obesity are excellent models for studying hypersensitivity to chronic pain symptoms. Additionally, we have shown that chemokines are involved in the development of hypersensitivity in both diabetes and obesity, but their participation, role, and mechanism depend on its etiology, as well as on the sex of the animal.

The presented results suggest the need for further research in this area in order to develop effective methods of treating chronic pain that are dependent on its causes and are gender-specific.

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Electromyographic activity in referred pain regions during prolonged dry needling of gluteus minimus: potential indicator of central sensitization

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Background and objectives: Referred pain caused by trigger points is an important diagnostic criterion. According to hypotheses, there may be disturbances in the autonomic, motor, and sensory systems in these areas. Although previous studies document atypical responses in the somatosensory and autonomic systems, motor changes in the area of referred pain are still poorly studied. Understanding these changes is crucial, as myofascial pain syndrome may be related to central sensitization. The aim of this study was to assess the bioelectrical activity of the thigh muscles in the area of referred pain during a 10-minute session of dry needling of the gluteus minimus muscle.

Methods: Twenty-eight participants were qualified for the study based on the Skorupska® Protocol, which assesses atypical vasomotor response in the area of referred pain. The control group (CON) included 15 healthy volunteers with negative results, while the experimental group (EXP) consisted of 13 Polish short-track athletes with positive results. Both groups participated in a 10-minute session of nociceptive stimulation of the gluteus minimus muscle, during which bioelectrical activity was recorded using surface electromyography. Signal analysis involved power spectral density analysis, and the Mann-Whitney U test was used to compare this parameter between groups.

Results: The power spectral density was higher in the EXP group in the thigh muscles, while no differences were observed in the hip girdle muscles. The most pronounced atypical changes in bioelectrical activity were observed in the vastus lateralis

muscle (0.605 *vs* 0.165; P = 0.006), the semitendinosus muscle (1.729 *vs* 0.143; P = 0.007), and the rectus femoris muscle (0.545 *vs* 0.163; P = 0.009).
Discussion: The study provided the first objective confirmation of atypical, remote motor phenomena in the thigh area, triggered by mechanical stimulation of trigger points in the small gluteus muscle. The observed motor phenomenon was characterized by selective and variable power spectral density values, but only in the presence of referred pain and a positive result from the Skorupska Protocol® (autonomic changes). Furthermore, the vastus lateralis, semitendinosus, and rectus femoris muscles, located in the area of referred pain, exhibited the highest intensity of bioelectrical activity. These results suggest the presence of a remote motor response related to referred pain, supporting the hypothesis of possible involvement of the central nervous system, which may serve as a potential indicator of central sensitization for myofascial pain.
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Non-obvious adverse events induced by opioid analgesics

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In clinical practice, we are accustomed to observing adverse symptoms with a specific clinical profile when using certain groups of medications. One of such groups, characterized by a difficult-to-define profile of adverse effects, is opioid analgesics. Based on a registry of adverse drug reactions, we present five cases of patients who experienced complications while using opioid analgesics, which were not causally linked to the opioid medications. The described complications included:
Patient TF – terminal stage of metastatic breast cancer; while using morphine, the patient developed rhabdomyolysis and was simultaneously taking ciprofloxacin and dexamethasone, indicating possible interactions in end-of-life pharmacotherapy.
Patient ZD – metastatic colorectal cancer with depression; during the use of oxycodone and sertraline, the patient experienced gum pain.
Patient DD – metastatic prostate cancer; myalgia occurred while using buprenorphine, with the patient concurrently taking methylprednisolone.
Patient TF – metastatic lung cancer; while using fentanyl in combination with dexamethasone, the patient developed adrenal insufficiency.
Patient WF – metastatic breast cancer; while using tapentadol, the patient experienced dizziness that impaired motor activity.
In all the described cases, clinical improvement was observed in the symptoms presented after modifications to the treatment regimen.

Effects of cognitive-behavioural and robotic therapy on pain in spinal cord injury patients

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Objectives: The main aim of the study was to assess the effectiveness of cognitive-behavioral therapy (CBT) for gait in the treatment of chronic pain and its impact on the level of belief regarding pain control in individuals with spinal cord injury (SCI) undergoing robotic gait therapy.
Methods: The study involved 105 participants, 23 of whom experienced chronic pain. The patients underwent a 7-week gait rehabilitation program (30 minutes per session) using rehabilitation robots (Lokomat, exoskeleton) combined with CBT. The Beliefs about Pain Control Questionnaire (BPCQ) and the Coping Strategies Questionnaire (CSQ) were used in the study.
Results: The test results were statistically significant for each pain control belief indicator following the application of CBT. A strong effect was observed for internal control and random events, while the effect for the doctors' influence indicator was moderate. After CBT and gait rehabilitation, a significant increase in the sense of internal control regarding pain management was noted. Following the therapy, participants believed that the influence of doctors and random events had less importance in controlling pain compared to before the therapy. A decrease in the use of coping strategies was observed only for catastrophizing, praying, and seeking hope. In contrast, there was an increased tendency to use other pain-coping strategies after the therapy compared to the pre-therapy measurements.
Conclusions: This study demonstrates that cognitive--behavioral therapy combined with robotic gait training has a positive impact on the well-being of patients with spinal cord injuries.