Evaluating Opioid Induced Hyperalgesia in Chronic Knee Pain

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Introduction

Opioid Induced Hyperalgesia (OIH) is defined by a paradoxical condition where sensitivity to pain increases with increasing prescription of opioids, resulting in a lowered pain threshold and reduced pain tolerance. OIH presents a significant challenge in clinical settings, particularly in patients with chronic pain who require long-term opioid therapy. As opioid prescriptions increase, particularly for the treatment of chronic nonmalignant pain, OIH is emerging as a more relevant and significant concern.

Corticosteroid injections (CSI) are one of the most common ways of suppressing chronic knee pain in both osteoarthritis and inflammatory arthritis. They act as local anti-inflammatories aimed to reduce the swelling by altering B and T cell function to reduce cytokine release. However, their usage needs to be monitored, as repeated injections over time can potentially weaken the surrounding tissues and may increase the risk of joint damage if used excessively.

Gabapentin, usually given as an anticonvulsant, has been shown to work in mitigating chronic neuropathic pain. It works by binding to the α2δ subunit of voltage-gated calcium channels, which helps to inhibit excitatory neurotransmitter release, thereby reducing nerve excitability and central sensitization. By combining gabapentin and tapering opioid doses, OIH symptoms can be mitigated and improve overall pain control in patients.

Case History

A 79-year old female presents to clinic due to bilateral chronic knee pain after being admitted to the ER for aggression and AMS. Work-up, which includes MRI and labs, were unremarkable, however, patient UTx was positive for barbiturates and methadone. Once stable, the patient was admitted to rehabilitation, but refused treatment. In initial consultation, there was a concern about left knee pain. Patient stated there were no acute triggers, pain was interval, and was taking 1 gram of Tylenol for pain.

Past medical history includes: Atrial fibrillation, anxiety, HLD, HTN, CAD, hypothyroidism, RA, polyneuropathy, MDD, chronic pain, legally blind, fibromyalgia, and hypothyroidism

Past trainings include: PLOF on previous eval ADL requires assistance in 2020 CLOF

PT 1/24/24: Establishment of bos and instructions provided on compensatory strategies for proximal stability to improve sitting balance and tolerance while seated eob. Pt. demonstrated good scooting and positional strategies without c/o discomfort.

Case History Continued

OT 02/01/24: Skilled interventions focused on bilateral integration, bilateral manipulation, dynamic balance activities during sitting, gross motor coordination, static balance activities during sitting and using small tools/items to increase manipulation with minimal/intermittent verbal instruction required to increase balance, coordination, functional activity tolerance, postural support/control and safety awareness.

During visit, the patient appears well, with no acute distress, and is lying in bed. The eyes are able to track the provider in the room, with no signs of scleral icterus or conjunctivitis. Head is normocephalic and atraumatic. There is no visible respiratory distress. Musculoskeletal system shows movement of the limbs against gravity. Psychologically, the patient exhibits a flat affect and is intermittently interactive.

Prescriptions of Methadone 10 mg Q12H and Gabapentin 300 mg BID were administered with Tylenol 325 mg 2 tablet PRN q6H for mild pain, and Lidocaine 5% patch to the left knee and tramadol HCl Oral Tablet 50 MG were prescribed for moderate pain PRN.

After a month of visit, Gabapentin was increased to TID, Lidocaine patch was reduced to 4%, and considered CSI. After discussion with patient, CSI were administered and considered increasing Gabapentin instead of genicular nerve blocks PRN. Patient reports knee pain improvement after administration of CSI and usage of Gabapentin.

Table 1: Course of Treatment

	Treatment 1	Treatment 2	Treatment 3
Initial Visit	Methadone 10 mg Q12H	Gabapentin 300 mg BID	Tylenol 325 mg 2 tablet PRN q6H Lidocaine 5% patch Tramadol HCl Oral Tablet 50 MG
8/16	Changed to Lidocaine 4% patch	Considered CSI if pain is over 7/10	-
9/18	Increased Gabapentin to TID	Reduced Tramadol	CTM to administer CSI
9/25-9/27	Administered CSI to Left Knee	Considered CSI for Right Knee PRN in 1-2 Weeks	-
10/4	Robaxin 750 mg 0.5 tablet BID PRN for CSI Injection	-	-
10/11	Patient reports knee pain is showing improvement after treatment.		

Diagnosis

We present a case study of a patient with suspected OIH resulting from opioid misuse, which exacerbated her chronic knee pain.

Discussion

Opioids can provide significant pain relief when used appropriately under medical supervision. However, continued abuse can lead to paradoxical pain and can exacerbate already chronic pain. Usage of gabapentin and CSI in this patient has shown significant improvement of pain that allowed the tapering of her medication.

Gabapentin prescribed for neuropathic pain has shown to be effective in alleviating OIH in this patient who is stable and abstinent during methadone treatment. Due to its ability to hyperpolarize neurons by acting on voltage-gated Ca2+ channels in the dorsal horn, gabapentin is able to reduce the activity by decreasing the transmission of pain signals along afferent neurons. By targeting the neuropathic pathway of OIH, gabapentin is one of the gold standards of reducing opioid dependence.

CSIs are short acting inflammatories that aim to inhibit immune function release of histamines, etc. and helped this patient by relieving pain by targeting possible inflammation in their knee. While CSIs do not target the root cause of OIH, it can help reduce overall pain and is one of the hallmarks for knee pain. By managing the pain through CSI, patients can slowly begin to taper their opioid dose to a more manageable dosing pattern.

Combining both gabapentin and CSI can enhance pain management and lead to a decrease in dependence of opioids. The patient was given a comprehensive pain management treatment therapy that provided a more robust reduction of pain. With effective pain management, this patient experienced improved mobility and function. Through this plan, the patient was able to maintain a higher quality of life.

Conclusion

As opioid prescriptions increase, particularly for the treatment of chronic non-malignant pain, OIH becomes an increasingly relevant and significant concern. This case study shows the possible efficacies of gabapentin and CSI to revert the pain caused by opioids. Through these administrations, we can continue to tackle chronic pain management through various other means.

Contact

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