

Opioid Induced Hyperalgesia with Intrathecal Infusion of High Dose Fentanyl

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Introduction

- ▶ Opioid induced hyperalgesia (OIH) was first described in 1943¹. Since then, a body of research has been accumulated regarding its pathophysiology.
- ▶ It was described in various settings including; methadone maintenance therapy, perioperative opioid administration, cancer-pain opioid therapy and intrathecal administration of Morphine and Sufentanil^{3,4,5}. To our knowledge, no cases of OIH were reported in the setting of intrathecal Fentanyl therapy.

Case presentation

- ▶ We report the case of a 60-year-old female with a history of chronic low back and legs pain secondary to L4 and L5 laminectomies posterior arthrodesis and fusion. She had minimal relief with heat/ice therapy, physical therapy, NSAIDS, Gabapentin and Tranforaminal/Interlaminar epidural steroid injections. Trials of opioids including oral OxyContin, Oxycodone, Hydromorphone and transdermal Fentanyl failed.
- ▶ Following a successful trial, an intrathecal drug delivery device was implanted initially controlling her pain. Afterwards, she complained of worsening diffuse pain, and the intrathecal infusion was increased. The intrathecal medications included continuous Fentanyl with Bupivacaine supplemented with breakthrough intrathecal doses. Ultimately, the patient received 93.67 mcg of Fentanyl and 3.50 mg of Bupivacaine daily.
- ▶ With increased dosing, she developed somnolence, poor attention and a worsening generalized pain. A catheter dye study and computed tomography scan confirmed the integrity of the catheter and an unchanged tip placement. Thus, we suspected OIH and accordingly, over one week, the patient underwent three 50% reductions in intrathecal medication doses. Ultimately, the device reservoir was filled with preservative-free Normal Saline.
- ▶ After three months, the patient reported improved pain and mental clarity. She had residual lower back pain controlled with oral Oxycodone 5mg TID .

Discussion

- ▶ Despite being described in the literature, OIH remains an elusive diagnosis due to its relative obscurity, ambiguous presentation and lack of diagnostic tests. Case reports and case series detail the poor awareness and misdiagnosis of OIH in the clinical setting leading to unnecessary workup and a delay the diagnosis and treatment.
- ▶ Several mechanisms were postulated, including activation of the NMDA receptors, and presence of opioid receptors on mast cells and glial cells². The lack of diagnostic testing presents the clinical dilemma of differentiating OIH from tolerance and progression of the disease in complex patients on high dose opioids⁶. Hence, clinical assessment is of utmost importance. OIH causes diffuse, poorly defined pain more generalized than the pre-existing pain. In undertreated pre-existing pain or pharmacologic tolerance, a dose increase is expected to improve symptoms. OIH worsens with increasing dosage.
- ▶ Our patient suffered from post-laminectomy syndrome pain initially well-controlled by a stable continuous infusion of a mixture of intrathecal Fentanyl and Bupivacaine with breakthrough dosing. She developed a new, severe, and generalized pain not explained by musculoskeletal injury or degenerative changes and resistant to conservative management and diagnostic blocks and increased dosing. Careful assessment and early suspicion were critical to diagnosing OIH and initiating the appropriate treatment.

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