

KETAMINE FOR MANAGEMENT OF ACUTE OPIOID INDUCED HYPERALGESIA (OIH)

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INTRODUCTION

- Opioid therapy is a cornerstone in postoperative pain management.
- However, Its use can sometimes lead to paradoxical effects, resulting in opioid-induced hyperalgesia (OIH).
- OIH is characterized by an increased sensitivity to pain resulting from the administration of opioids, complicating pain management strategies and potentially prolonging recovery times.
- Patients experiencing OIH may report worsening pain despite increasing opioid doses, often accompanied by the development of allodynia (pain from stimuli that typically do not provoke pain) and hyperalgesia (heightened pain response to normally painful stimuli).
- While more often associated with chronic opioid use, in the acute setting, OIH can lead to significant challenges in achieving effective analgesia.

MATERIALS & METHODS

- Patient informed consent obtained.

RESULTS/CASE REPORT

- 62-year-old female with history including end stage renal disease (ESRD) on hemodialysis (HD), peripheral vascular disease (s/p right below knee amputation), celiac artery stenosis, hx of PE, CAD, COPD, DM2, choledocholithiasis status post robotic laparoscopic cholecystectomy (two months PTA) complicated by liver lac/hematoma, bile leak s/p endoscopic retrograde cholangiopancreatography and common bile duct (CBD) stent placement (one month PTA) presented to the ED with diffuse abdominal pain and vomiting and was found to have migrated CBD stent (soon removed).
- Hospitalization was complicated by Enterococcus faecium bacteremia, hepatic abscesses, and recently a witnessed fall (9/12/2024) on the floor, found to have left femoral neck fracture.

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Highlighted are the clinical challenges faced in diagnosing and managing this condition, emphasizing the importance of recognizing OIH as a possible complication in postoperative care.

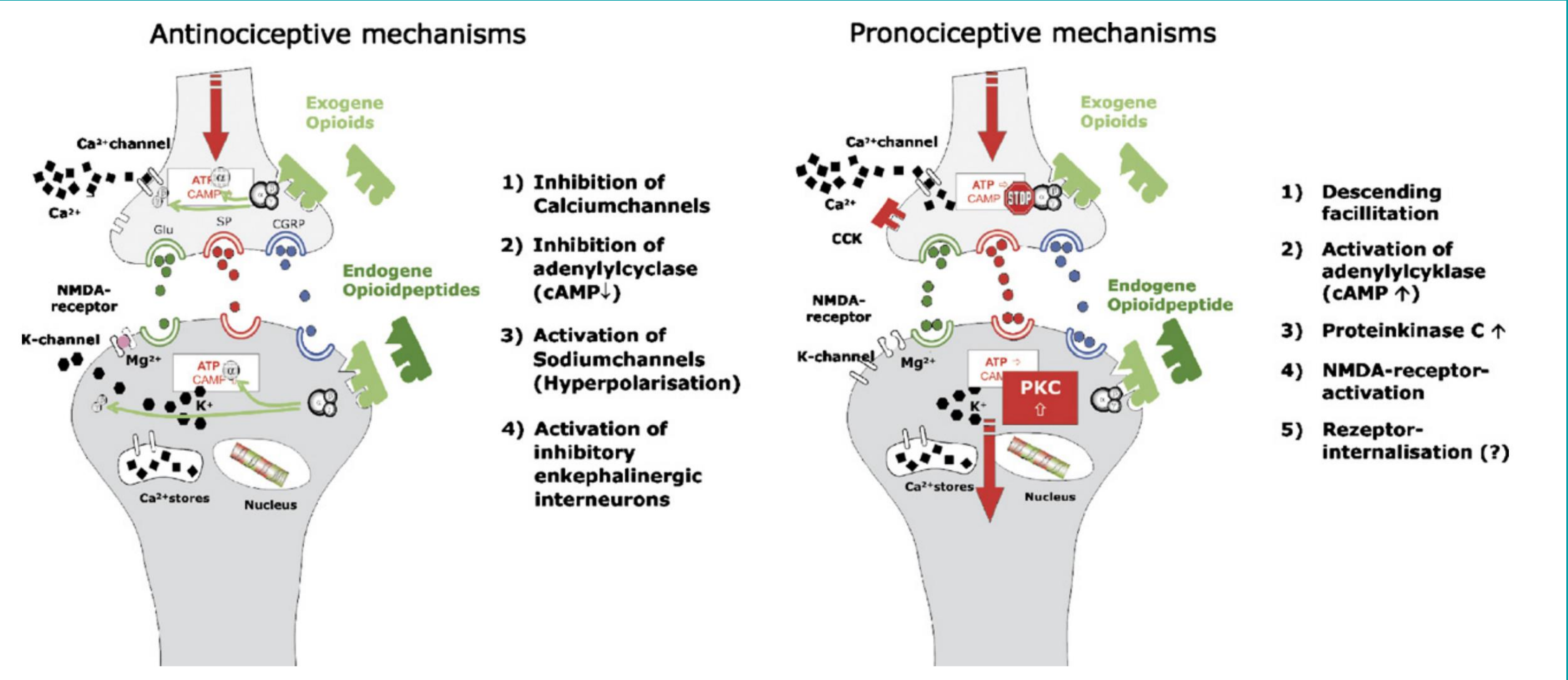


Figure 1: Schematic diagram of antinociceptive and pronociceptive mechanisms mediated by mu-agonists.

Koppert, W. (2007). Opioid-induced hyperalgesia—Pathophysiology and clinical relevance. *Acute Pain*, 9(1), 21–34. doi:10.1016/j.acpain.2006.11.001

RESULTS/CASE REPORT (cont.)

- Since cholecystectomy, ongoing chronic abdominal pain required prescription, averaging <5mg of oxycodone daily.
- After admission (but before hip fracture), received hydromorphone due to worsening abdominal pain, with daily morphine milligram equivalent (MME) increasing from 25 to 150. Multimodals included Tylenol and Pregabalin.
- After hip fracture, hydromorphone increased to 220 MME.

- APS was consulted for perioperative pain management prior to procedure and performed femoral nerve block with 20ml of 0.2% ropivacaine (w/epinephrine).
- Patient experienced partial pain relief with block and subsequently underwent left hip hemiarthroplasty under GETA. Intraoperative meds include 1mg IV hydromorphone and 100mcg fentanyl at induction.

- POD1: severe left hip pain. 257 MME. Decision to start ketamine infusion (3mcg/kg/min), with some effect.
- POD2: somnolent/unresponsive with hypotension, leading to a rapid response. Ketamine stopped and 40mcg of intravenous naloxone was given with response. Started complaining of severe pain. Ketamine infusion (4mcg/kg/min) with no change in her opioid regimen.
- POD3: remained on ketamine infusion 3 mcg/kg/min despite daily MME between 232-250. Continued 10/10 sharp/spasmodic pain throughout the left lower extremity w/radiation from hip to foot.
- POD4: opioid-induced hyperalgesia suspected. Opioid regimen changed to oxycodone 5mg q4h PRN, IV hydromorphone 0.5mg q8h PRN, and tizanidine 4mg q6h started.
- POD5: Opioid use plummeted to 35 MME, yet improved pain control and sense of “making progress”. Markedly more comfortable on exam. IV hydromorphone discontinued.
- POD6-8: ketamine infusion was weaned off
- POD11: she was weaned off all opioids.

DISCUSSION

- Addressing OIH can be challenging. Cornerstones of treatment include reducing opioid dosage, multimodal analgesia as well as other alternative therapies.
- It is essential for clinicians to monitor patients closely and consider multimodal approaches to pain relief that minimize opioid use when possible.
- Early recognition and adjustment of treatment strategies can help mitigate the risks associated with OIH, even in patients on short-term opioid therapy.
- By examining this case, we hope to contribute to the growing body of literature that seeks to refine pain management protocols and improve patient outcomes in the surgical setting.



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