



Ketamine infusion in acute hepatic failure to facilitate weaning of high-dose intravenous opioids: a case report

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Introduction

Ketamine attenuates **opioid-induced hyperalgesia** via **NMDA receptor antagonism**

- Often used for **opioid-refractory cancer pain**

Hepatic metabolism **raises safety concerns** in patients with liver dysfunction

Case Report

44-year-old female with metastatic uterine carcinosarcoma presented with acute-on-chronic severe cancer related pain, acute obstructive liver failure with new onset jaundice, fluctuating mental status, and acute kidney injury

Hospital day 1 → 3

- Obstructive LFTs, peaking on hospital day 3: ALP 424 U/L, AST 98 U/L, ALT 76 U/L, total bilirubin 12.7 mg/dL.
- Initial pain management : IV hydromorphone PCA as high as 4 mg every 10 minutes, increased methadone, and IV dexamethasone.

Hospital day 5

- Acute Pain Service consulted for low-dose ketamine infusion.
- Within 36 hours, opioid requirements decreased substantially and PCA dose weaned.

Hospital day 7 → Discharge

- Ketamine discontinued due to mild neuropsychiatric effects
- Transitioned to PO opioids and discharged a week later with improved pain control.

Main Takeaways

**Peak opioid requirement:
3,262 MME / 24 hours**



**Reduced ~50% after ketamine infusion
in the setting of acute hepatic failure**

Low-dose ketamine infusion facilitated rapid opioid reduction in a patient with severe cancer-related pain and opioid-induced hyperalgesia.

Ketamine can be considered even in the setting of acute hepatic dysfunction when benefits outweigh risks and liver function is closely monitored.

NMDA receptor antagonism enabled significant opioid-sparing effects, even in patients receiving extremely high opioid doses (>3000 MME/day).

Multidisciplinary pain consultation and careful monitoring for neuropsychiatric effects are critical when using ketamine in medically complex patients.

Discussion

Low-dose inpatient ketamine infusions have **facilitated opioid tapering** in chronic pain patients, achieving **>50% sustained opioid reduction with minimal adverse effects**.¹

Short-term analgesic benefit of ketamine in refractory chronic pain and reported **antinociceptive, opioid-potentiating, and tolerance-reversing effects**.^{2,3}

Opioid-sparing effects of ketamine in cirrhosis.⁴

Limited literature describing ketamine infusion in acute hepatic failure.

Resources

- Elyn A, Roussin A, Lestrade C, *et al* Low-dose ketamine infusion to facilitate opioid tapering in chronic non-cancer pain with opioid-use disorder: a historical cohort study *Regional Anesthesia & Pain Medicine* Published Online First: 18 March 2024. doi: 10.1136/rapm-2023-105035
- Orhurhu V, Orhurhu MS, Bhatia A, Cohen SP. Ketamine Infusions for Chronic Pain: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Anesth Analg*. 2019 Jul;129(1):241-254. doi: 10.1213/ANE.0000000000004185. PMID: 31082965.
- Chazan S, Ekstein MP, Marouani N, Weinbroum AA. Ketamine for acute and subacute pain in opioid-tolerant patients. *J Opioid Manag*. 2008 May-Jun;4(3):173-80. doi: 10.5055/jom.2008.0023. PMID: 18717513.
- Ibrahim, E.S., Metwally, A.A., Abdullatif, M. *et al*. Opioid sparing anesthesia in patients with liver cirrhosis undergoing liver resection: a controlled randomized double-blind study. *BMC Anesthesiol* 25, 53 (2025). <https://doi.org/10.1186/s12871-025-02915-4>