Conclusion
For our patient, the initiation of a nightly ketamine infusion led to an improvement in pain scores and sleep.

Discontinuing the infusion during the day ensured that the patient could continue to interact with family during the day and allowed her parents and ICU team to assess her degree of pain control.

While palliative pain control remains a challenge, emerging literature and our experience in this case suggests that ketamine infusions, as part of a multimodal approach, can decrease pain and improve quality of life with low rates of adverse effects.1,3,4 More research is needed to guide dosing, titration, and optimal duration of ketamine infusions for our pediatric patients.

References

Introduction
Pain refractory to opioid therapy remains a challenge in management of terminally ill pediatric patients. Less than 30% of terminally ill children have adequate pain control (Wolfe et al., 2000). Ketamine has been shown to be an effective and safe analgesic in adults, but few studies are available in the pediatric population to help guide the pediatric pain provider on dosing, titration, and duration of treatment.

Case Description
A 19 year old female with glutaric acidemia type I was admitted for respiratory distress due to aspiration. Her course was complicated by intestinal dysmotility of unclear etiology, tachycardia (150’s) and agitation due to pain. The pediatric pain team was consulted.

Management: The patient was started on a fentanyl patch and a nightly ketamine infusion at 5 mg/hr for a 12 hour period which was titrated over a week to 10 mg/hr. Scheduled and PRN lorazepam and PRN hydromorphone were continued.

Results: After initiation of the ketamine infusion, the FLACC scores decreased to 0-1, heart rate lowered and the agitation decreased.

Discussion
Ketamine is a noncompetitive NMDA receptor antagonist known to attenuate central sensitization, windup, hyperalgesia, and opioid tolerance.

Ketamine in pediatric studies:
- Ketamine infusions initiated at a rate of 0.5 mg/kg/hr and increased up to a rate of 4.1 mg/kg/hr led to an improvement in analgesia and quality of life in two pediatric patients. (1)
- Ketamine infusion at a rate of 0.12mg/kg/hr decreased pain scores from 10/10 to approximately 2/10 in a 5-year-old patient. (2)
- The use of Ketamine PCA’s with a median initial infusion of 0.06 mg/kg/hr and a maximum of 0.308 mg/kg/hr showed a stabilization of or a decrease in opioid requirements within seven days. (3)

Benefits of Ketamine:
- Ketamine is a noncompetitive antagonist of the NMDA receptor, but it also interacts with opioid and cholinergic receptors and exerts a local anesthetic effect.
  - Decreases opioid induced hyperalgesia
  - Potentiates opioid analgesia
  - Anti-inflammatory
  - Antidepressant
  - Diminishes windup and sensitization

An Underutilized Resource- Ketamine for our Pediatric Pain Patients
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