

Case Study of High-Dose Ketamine for Treatment of Complex Regional Pain Syndrome in the Pediatric Intensive Care Unit

Tracy Ann Pasek, RN, MSN, DNP, CCNS, CCRN, CIMI^{a,*},
Kelli Crowley, PharmD, BCPS, BCPPS^b, Catherine Campese, RN, MSN, CPNP^c,
Rachel Lauer, RN, MSN, FNP-BC^c, Charles Yang, MD^c

KEYWORDS

- Complex regional pain syndrome • Pediatric • Pain • Ketamine
- Pediatric critical care • Pediatric intensive care unit
- Pharmacologic pain management • Advanced practice nursing

KEY POINTS

- Refractory pediatric CRPS is not a common development but when it occurs, there are significant physical, psychological and social effects.
- Interest has expanded to include ketamine's potential role in the treatment of chronic pain syndromes such as complex regional pain syndrome.
- Preparing for the admission of a patient with CRPS to the PICU for pain management presented a unique opportunity for collaboration among advanced practice nurses.

INTRODUCTION

Complex regional pain syndrome (CRPS) is a life-altering and debilitating chronic pain condition. A hallmark symptom of CRPS is severe neuropathic pain that is disproportionate to pain that would be expected of an associated or causal injury.¹ In fact, a patient may not recall experiencing an injury to an extremity, for example, that involved soft tissue or peripheral nerves before being diagnosed with CRPS.¹

^a Pain, Pediatric Intensive Care Unit, Evidence-Based Practice and Research, Children's Hospital of Pittsburgh, University of Pittsburgh Medical Center, Pittsburgh, PA, USA; ^b Department of Pharmacy, Children's Hospital of Pittsburgh, University of Pittsburgh Medical Center, Pittsburgh, PA, USA; ^c Department of Anesthesiology, Children's Hospital of Pittsburgh, University of Pittsburgh Medical Center, Pittsburgh, PA, USA

* Corresponding author. PICU-Critical Care Nursing Administration, Children's Hospital of Pittsburgh, University of Pittsburgh Medical Center, 4401 Penn Avenue, Pittsburgh, PA 15224.

E-mail address: Tracy.Pasek@chp.edu

Characteristics of pain associated with CRPS include allodynia or pain evoked from what would ordinarily be nonpainful stimuli.¹ More specifically, mecanoallodynia is pain from light touch or pressure to a body part (eg, a pat on the arm).¹ Changes in skin temperature can also result in pain known as thermal allodynia.¹ Hyperalgesia or extreme sensitivity to pain is also part of CRPS. Additionally, a patient may experience hyperpathia. Hyperpathia occurs when repeated or prolonged nonpainful stimuli become perceived as painful.¹

We present a case study of a female who received high-dose ketamine for the management of her CRPS. The innovative treatment lies not only within the pharmacologic management of her pain, but in the fact that she was the first patient to be admitted to our pediatric intensive care unit (PICU) solely for pain control. Furthermore, she was a young adult and not a pediatric patient (>21 years of age). The coordination of her pre-admission care required remarkable planning. The patient's positive outcomes at discharge from the hospital to a rehabilitation setting were compelling. Although we comprehensively addressed the "four pillars of CRPS treatment," this paper has as its foci the pillars of pain relief and the support of the patient's self-management.^{2,3}

METHODS

We provided direct care to this patient. Additionally, we conducted a retrospective chart review.

CASE

The patient was treated with a high-dose intravenous ketamine infusion and 2 lumbar epidural catheters during her 22-day PICU stay. Her pain intensity at its worst was reported as 7 out of 10 using a self-report pain assessment scale. Ketamine was slowly titrated from 10 mg/h to 110 mg/h over a period of 11 days. After the fourth day of ketamine therapy and after the placement of epidural catheters infusing ropivacaine 0.1%, she experienced decreased pain. Moreover, she was able to tolerate having her left lower extremity touched. Initially, we used lidocaine 2% in the epidurals, but this was not tolerated. Changing to ropivacaine 0.1% was a key turning point for the patient and her pain remained stable with the lowest intensity of 5 out of 10.

Initial progress was evidenced by her ability to roll side to side with minimal assistance. The patient reported relief of hand dystonia. She experienced ketamine-related adverse effects, including decreased appetite and a mild sensation of bladder fullness, despite a urinary catheter during epidural therapy. She experienced dysphoria and hallucinations with the lidocaine 2% therapy until it was discontinued. The patient reported having vivid dreams and she became somnolent when her ketamine dose was titrated to doses near 100 mg/h. We used midazolam to combat the adverse side effects of ketamine and this was effective. Overall, the patient tolerated the intravenous ketamine infusion well with aggressive control of adverse effects.

We initiated physical therapy on day 1 of her PICU stay. Once her pain decreased, she began tolerating the physical therapy with fewer complaints. She had good strength and motion of all extremities because the epidurals enhanced the outcomes of physical therapy. She became very motivated to progress with the vigilant support of her family. By the second week of hospitalization, she was sitting upright in a cardiac chair for hours at a time. She did not experience syncopal events in the cardiac chair or with other physical therapy interventions.

The epidural therapy was weaned after 9 days and she did not experience pain escalation with this. After removal of the epidural catheters, the ketamine infusion was continued another for another day, at which time the patient was weaned to

Download English Version:

<https://daneshyari.com/en/article/5636487>

Download Persian Version:

<https://daneshyari.com/article/5636487>

[Daneshyari.com](https://daneshyari.com)