**14. EARLY LOW DOSE KETAMINE INFUSION FOR ACUTE PAIN CONTROL IN THE CRITICALLY-INJURED TRAUMA PATIENT**  

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**Background:** Ketamine has emerged as an adjunct for acute pain management in the setting of the opioid crisis. Research regarding the efficacy of ketamine for pain control in trauma is limited. We aimed to investigate the efficacy and feasibility of ketamine as a first-line pain control agent in critically-injured trauma patients. We hypothesized that patients who received an early continuous infusion of low-dose ketamine (LDK) would require fewer morphine milligram equivalents (MME) on hospital discharge than patients managed with standard analgesia.

**Methods:** Retrospective case-control analysis in trauma patients admitted to an intensive care unit (ICU) at an ACS-verified Level I trauma center who were placed on a novel LDK protocol for acute pain control. Patients qualified for LDK infusion if unable to achieve pain control with non-opioid pain medications within 24 hours of injury. LDK was initiated at a sub-dissociative dose from 0.1-0.5 mg/kg/hr for 48 hours or until transfer out of ICU. The primary outcome was MME prescribed at hospital discharge. Secondary outcomes included daily inpatient MME, MME during the ketamine infusion, 24-hour numeric pain score (NPS), hospital length of stay. An historical comparator cohort was matched in a 1:1 fashion to low-dose ketamine patients. Students’ T-tests were used to compare continuous outcomes, and tests of independent proportions were used to compare percentages between groups. A subgroup analysis evaluating the primary outcome was performed in patients stratified by ISS.

**Results:** 49 patients were enrolled to the LDK infusion protocol and were matched to a cohort of 49 standard-of-care controls. Patients were primarily middle-aged males who suffered blunt trauma (ISS 22.3 [11.5] ketamine, 21.69 [12.1] control). There was no difference in discharge MME (18.8 [23.3] ketamine, 22.95 [22.6] control, p=0.37) or mean daily inpatient MME (28.01 [24.6] ketamine, 28.39 [26.6] control, p=0.94). When evaluating discharge MME by ISS, only the mildly injured group (ISS ≤15) demonstrated a trend toward decreased discharge MME with LDK (17.4 [22.1] versus 32.3 [22.6], p=0.08). 24 hour NPS did not differ between groups (6.0 [2.0] ketamine, 5.19 [2.6] control, p=0.08). There was no difference in hospital length of stay. In the ketamine group, mean maximum ketamine dose was 12.4 (8.9) mg/hour, with a mean duration of infusion of 39.4 (25.4) hours. During the first 24 hours of the LDK infusion, the mean MME required was 21.7 (31.2), with 19 (38.8%) patients requiring no opioids. In 5 patients the infusion was discontinued due to hallucinations or delirium.

**Conclusion:** In multiply-injured trauma patients admitted to an ICU, initiation of an early low-dose ketamine infusion did not reduce opioid intake on hospital discharge or during hospitalization, nor did it reduce numeric pain scores. Early initiation of LDK may have utility in mildly injured patients with less complicated pain as an effort to avoid opioids. Opioid use was lower during the LDK infusion when compared to use after discontinuation, suggesting an opioid-reducing benefit, although only with short-term effects. Further investigation is needed to determine if LDK is a useful opioid-sparing adjunct in the trauma patient.