Ketamine Sedation & Hypoxia: A Quality Improvement Project to reduce hypoxia rates requiring intervention.

Introduction: IV Ketamine is commonly used for procedural sedation in -pediatric emergency departments (ED) and has been associated with hypoxia-. Rates of hypoxia during Ketamine sedation in our ED are higher (9.3%) than reflected in the literature (9.3% vs 1.4-6.6%). We also found a correlation between administration of opioids prior to sedation and increased risk of hypoxia (r2: 0.605, p: 0.019). A multi-disciplinary team was therefore assembled to address the increased risk of respiratory adverse events by modifying factors potentially influencing rates of hypoxia in these patients. during Ketamine-based procedural sedation in patients receiving prior opioids in the ED/UC. Our goal was to decrease the frequency of hypoxic events (HE) requiring interventions from 9.3 % to <6% in patients receiving opioids prior to ketamine sedation.

Methods: The first intervention chosen was decreasing the initial dose of Ketamine for all patients who received an opiate within 90 minutes prior to sedation. The initial dose was decreased from 1mg/kg to 0.75 mg/kg and subsequent dosing of 0.5 mg/kg was given until an adequate plane of sedation was reached. The primary outcome measured was frequency of hypoxia. Secondary outcomes measured included adequacy and length of sedation, and length of stay (LOS).

Results: Analysis of 465 moderate-level sedations (March-November, 2017) showed no significant change in rates of hypoxia compared to baseline (9.3% before vs 9.7% after intervention) despite changes in ketamine dosing. There was still a higher frequency of hypoxic events in patients receiving opioids prior to sedation than those who did not (13.6% vs 7.7%, p 0.048),. There was no difference in HE associated with total dose of Ketamine, LOS, or length of sedation.

Discussion: We found no change to overall rates of HE after decreasing the initial dose of Ketamine, though the association of HE with opioid use prior to sedation remained consistent. This analysis looked at dosing, not timing of sedative administration. It is possible that administering ketamine slowly over 60-90 seconds as suggested by some experts[3], rather than as a bolus dose may reduce respiratory depression. Continued quality improvement efforts to reduce HE during ketamine-based sedation in patients receiving prior opioids will target the administration timing of ketamine. Future studies may also investigation into the impact of a single vs multiple doses of ketamine , and the relationship between specific opioids used and the incidence of HE.

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