Ketamine-Associated Vomiting Prolongs Length of Stay in the Pediatric Emergency Department

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BACKGROUND: Hundreds of children each year undergo sedation in the Emergency Department (ED) with Ketamine for simple, painful, brief procedures. These patients are known to have a prolonged length of stay (LOS) compared to other ED patients. Ketamine-associated vomiting (KAV) is a common and uncomfortable complication that affects at least 20% of patients who receive Ketamine at our institution, which is higher than the national average. The occurrence of KAV further prolongs LOS because patients who vomit are often monitored for an extended period of time to ensure that they tolerate oral intake prior to discharge.

OBJECTIVES: The goal of this project is to examine one of the drivers for prolonged LOS in the ED for patients undergoing procedural sedation with Ketamine, specifically focusing on the effects of prophylactic Ondansetron on KAV and LOS.

DESIGN/METHOD: Through retrospective chart review, we identified 425 patients who received Ketamine for procedural sedation in the ED at Ann and Robert H. Lurie Children's Hospital of Chicago between May 2017, and February 2019, excluding patients admitted to the hospital. We organized these patients into three groups: those who did not receive Ondansetron, those who received Ondansetron as prophylaxis prior to receiving Ketamine, and those who received Ondansetron post-sedation. We presumed that the patients who received post-sedation Ondansetron did so because they experienced KAV. Quantitative variables, including the three LOS outcomes – times from rooming to ketamine administration, ketamine administration to discharge, and rooming to discharge – were compared among groups using the Kruskal-Wallis test, with pairwise comparison conducted via Wilcoxon's rank sum test and Benjamini-Hochberg correction for multiple comparisons. Categorical variables were compared among groups with chi-square tests. An adjusted comparison of outcomes was conducted through the fitting of generalized least squares (GLS) model with age and dose level as adjusting covariates.

RESULTS: Retrospective determination showed 59% (249/425) of patients did not receive Ondansetron compared to 26% (109/425) as prophylaxis and 16% (67/425) post-sedation. Of the patients who did not receive prophylactic Ondansetron, 21% (67/316) required administration post-sedation. This is consistent with our known KAV rate of 20-25%. There were significant differences in the time from Ketamine administration to discharge among groups ($p < .001$). Those receiving Ondansetron post-procedure had a longer mean time to discharge (149 min) than those receiving Ondansetron prophylactically (113 min; $p < .001$) and those not receiving Ondansetron (118 min; $p < .001$). Similar results were observed for time from rooming to discharge – a difference among all three groups ($p < .001$) with mean times for the post-procedure group longer (347 min) than the prophylactic (308 min; $p < .004$) and no Ondansetron groups (306 min; $p < .004$), the latter two having equivalent means ($p = .90$). No differences were observed for the time from rooming to ketamine administration ($p = .36$). This suggests that the difference in total LOS between groups is related to factors after the administration of Ketamine.

CONCLUSION: KAV is a common side effect of Ketamine administration, and affected patients have a longer LOS than unaffected patients. Prophylactic Ondansetron greatly reduces the risk for KAV, leading to no difference in LOS when compared to patients without KAV who did not receive prophylaxis. Our findings support the use of Ondansetron as KAV prophylaxis for patients undergoing procedural sedation with Ketamine.