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Patanwala A, McKinney C, Erstad B, Sakles J. Retrospective analysis of etomidate versus ketamine for first-pass intubation success in an academic emergency department. Academic Emergency Medicine: Official Journal Of The Society For Academic Emergency Medicine [serial online]. January 2014;21(1):87-91. Available from: MEDLINE with Full Text, Ipswich, MA. Accessed September 5, 2014.
Objective: to compare first-pass intubation success between patients who received etomidate versus ketamine for rapid sequence intubation in the emergency department.
Hypothesis: There is no difference in first-pass success between the two agents.
Introduction: Rapid sequence intubation (RSI) is the mainstay of airway management in critically ill emergency department (ED) patients. Most studies evaluating intubation conditions or success rates have traditionally focused on comparisons of neuromuscular blockers. Sedative used may also influence intubating conditions and success rates by reducing the time to maximal neuromuscular blockade; potentiating the effect of the neuromuscular blocker; and affecting diaphragmatic, laryngeal, and pharyngeal reactivity to the intubation stimulus. The complications associated with intubation increases as the number of attempts at intubation increases. Therefore, it is important that intubation success is achieved on the first-pass, and studies are needed to ascertain if ketamine use is associated with a reduction in intubation success compared to etomidate before it can be routinely recommended.
Study Design: Retrospective analysis of prospectively collected data recorded in a quality improvement database between July 1, 2007 and December 31, 2012. Patients that were intubated using any agents other than Succinylcholine, Rocuronium, Etomidate or Ketamine were excluded. potential confounding variables (age, sex, paralytic used, trauma status, reason for intubation, device used, failure of prehospital intubation, reason for device selection, difficult airway parameters, and physician training) were included in the model.
Primary Outcome definition: An intubation attempt was defined as the insertion and subsequent removal of the laryngoscopic device from the patient's mouth, regardless of whether an attempt was made to pass a tracheal tube. Intubation success was defined as correct placement of the tracheal tube into the trachea, which was confirmed by end-tidal CO2 capnometry, pulse oximetry, chest auscultation, observation of chest excursion, absence of epigastric sounds, and misting of the endotracheal tube.
Results: First-pass success occurred in 77.0% of patients in the etomidate group and 79.1% of patients in the ketamine group (difference = –2.1; 95% CI = –5.5 to 9.8). In the multivariate analysis, after the potential confounders and baseline differences were adjusted for, ketamine use was not associated with a reduction in first-pass success (odds ratio = 0.89; 95% CI = 0.5 to 1.5; p = 0.632) compared to etomidate.
Conclusion: Etomidate and ketamine were associated with equivalent first-pass success in this retrospective review. A prospective randomized trial of first-pass success is needed to confirm these findings.
Limitations: The study was a retrospective study and thus strength of the study is limited and not as good as a prospective randomly controlled study. The etomidate group had a significantly larger sample size than the ketamine group (1983 vs 115). Sample used for statistical analysis was from data collected from one institution and so cannot be extrapolated to other facilities or institutions. The difficult airway variable did not look at standard assessments of difficult airway evaluation such as Mallampati score and instead just looked at general airway characteristics (such as blood or vomit in the airway, short neck, cervical collar, small mandible, obesity, airway edema, facial trauma, or large tongue) that could make intubating more challenging. This allows for a more subjective evaluation of airway difficulty. There may have been an element of measurement bias because physicians performing each intubation completed the data forms themselves instead of an independent unbiased observer. Some of the data collection forms were not completed or submitted in a timely manner after the intubations which could cause recall bias. The dosage of sedative and paralytic were not considered in the statistical analysis and could have a significant effect on first-pass success.