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Rocuronium and succinylcholine outcomes in rapid sequence in the emergency department in pediatric patients

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Background: neuromuscular blocking agents used as paralytics in the emergency department (ED) during rapid sequence intubation (RSI). While several prior studies in the past have compared these drugs in adults, very few have been conducted determining which agent is preferred for children. This study analyzed outcomes of death, posttraumatic disorder (PTSD) and malignant hyperthermia for children administered succinylcholine versus rocuronium for RSI in the ED.

Methods: This retrospective, propensity matched study utilized the TriNetX database, which provides de-identified electronic medical records of over 110 million patients from 66 health care organizations across the United States. Cohorts included children less than or equal to 17 years of age, given etomidate and ketamine during intubation in the ED from 2004 to 2024. Cohorts were further stratified by the administration of succinylcholine or rocuronium. The outcomes measured were death and post-traumatic stress disorder (PTSD). Propensity matching was done for age, sex, ethnicity/race, and several pre-existing conditions associated with mortality.

Results: Before propensity matching 1,151 pediatric patients were identified. After propensity matching 744 patients were identified in each cohort. After propensity matching, children administered succinylcholine had 31% less risk of death (6.1% vs 8.7%, RR 0.693, 95% CI [0.309-1.48], p = 0.048) but no significant difference in risk of PTSD (2.1% vs 3.2%, RR 0.64, 95% CI [0.320-1.600], p = 0.319) but trended to significance for the rocuronium group. Outcomes were similar before propensity matching. There was no significant difference in malignant hyperthermia

Conclusions: There was a significant decrease in risk for mortality in children administered succinylcholine for RSI when compared to rocuronium. These findings suggest that when compared to rocuronium, succinylcholine may be a safer paralytic agent for RSI in the ED when there are no contraindications.

Biography

Donna Mendez is a board-certified Pediatrician as well as Pediatric Emergency Medicine physician. She completed her pediatric residency at University of Texas Health Science Center (UTHSC) in San Antonio, and a fellowship in Pediatric Emergency Medicine (PEM) at University of Texas Southwestern in Dallas. She is currently an attending at The University of Texas Medical Branch at Galveston. Her research focus is on PEM and medical education. She is a Decision Editor for West Journal of Emergency Medicine and reviewer for Journal of Trauma, Pediatrics and Journal of Advances in Health Sciences Education. She established the Pediatric Emergency Medicine Fellowship at UTHSC- Houston and served as director for 7 years. She has received her Doctorate in Professional Leadership with an Emphasis in Health Science Education from The University of Houston

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