Rocuronium Versus Succinylcholine in the Traumatically Injured Brain: A Prospective, Pilot Study

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Background

- In 2014, there were approximately 2.9 million emergency department (ED) visits in the United States due to traumatic brain injury (TBI).[1]
- In TBI patients, the severity of brain injury is commonly assessed using the Glasgow Coma Scale (GCS) with a score of 9-12 considered moderate and 3-8 considered severe.[2]
- Patients presenting with a TBI often require rapid sequence intubation (RSI) to protect their airway.
- Common paralytics for RSI are succinylcholine and rocuronium due to their rapid onset of action and relatively short duration.
- Currently, there are no recommendations in the Brain Trauma Foundation Guidelines on agents of choice for RSI in patients with a severe TBI.[3]
- Animal models have demonstrated an increase in intracranial pressure with the administration of succinylcholine, which has led to concern when administered to TBI patients.[4]
- Recent retrospective data has suggested an increase in mortality associated with the administration of succinylcholine in TBI patients compared to rocuronium.[5]

Objective

To assess mortality among other outcomes following RSI with rocuronium compared to succinylcholine for patients presenting to the ED suffering acute TBI.

Methodology

Design:

Prospective, observational cohort

Inclusion Criteria:

- Patients enrolled from September 2018 through June 2020
- Presentation to ED with TBI
- Administration of either succinylcholine or rocuronium for RSI
- Age ≥ 18 years of age

Exclusion criteria:

- Pregnancy
- Paralytic agent other than succinylcholine or rocuronium administered
- Surgical airway placed
- Cardiac arrest prior to intubation
- Intubation prior to ED arrival

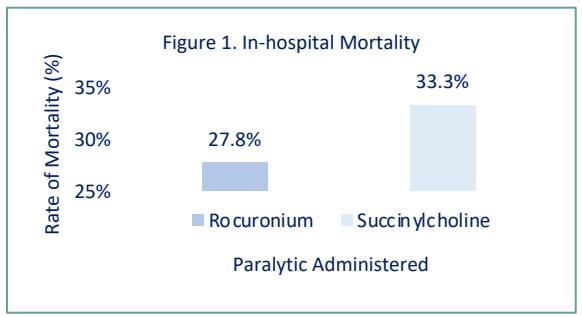
Results

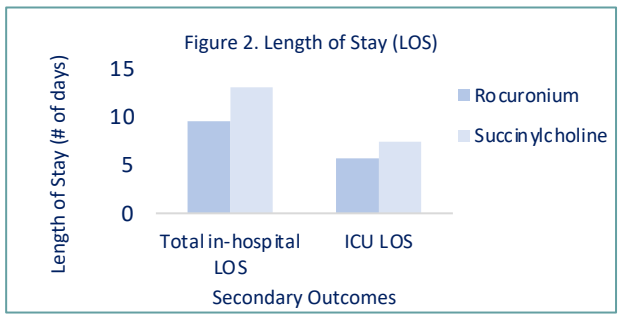
Table 1.

Demographics		Rocuronium (n=18)	Succinylcholine (n=42)	*P* value
Age (years), mean		51.1	46	0.35
Sex (male), n (%)		14 (77.8)	36 (89.7)	0.45
Body mass index, mean		27.3	27.3	0.78
Home anticoagulant use, n (%)		2 (11.1)	5 (11.9)	0.93
Home antiplatelet use, n (%)		3 (16.7)	3 (7.1)	0.35
Initial GCS, mean		5.7	6.5	0.38
	Minor, n (%)	0 (0)	5 (11.9)	0.42
	Moderate, n (%)	4 (22.2)	8 (19.1)	
	Severe, n (%)	14 (77.8)	29 (69.1)	
Seizure prophylaxis, n (%)		15 (83.3)	33 (71.4)	0.33

Table 2.

Outcomes		Rocuronium (n=15)	Succinylcholine (n=29)	*P* value
In-hospital mortality, n (%)		5 (27.8)	14 (33.3)	0.67
In-hospital survival, n (%)				
	Discharge home	5 (27.8)	11 (26.2)	0.90
	Transfer to rehab	6 (33.3)	8 (19.1)	0.23
	Transfer to long term care	2 (11.1)	9 (21.4)	0.34
Length of stay, days				
	In-hospital	9.5 ± 7.8	13 ± 12.5	0.43
	ICU	5.7 ± 6.8	7.4 ± 6.6	0.39





Conclusions

1. **Primary Endpoint:** There was no difference detected in the incidence of in-hospital mortality.
2. **Secondary Endpoints:** There was no difference in incidence in ICU LOS or in-hospital outcomes.

Overall, these results are inconclusive due to low patient enrollment. Patient enrollment is ongoing.

References

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