

# Rocuronium vs Succinylcholine in the Emergency Department: A Critical Appraisal

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- Background : Two methods of paralysis are available for rapid sequence intubation (RSI) in the emergency department.
- Succinylcholine (depolarizing agent) vs Rocuronium (non-depolarizing agent )

	Succinylcholine	Rocuronium
<b>Advantages</b>	1.Rapid onset,a short half-life and excellent intubating conditions 2.No adverse cardiovascular effects 3.Allow return of spontaneous respirator function in 5-10 min	1.Cusing less pain due to post-paralysis myalgias. 2.Useful when succinylcholine is contraindicated.
<b>Contraindications</b>	1.Post-paralysis pain due to the fasciculations 2.Hx of malignant hyperthermia 3.Denervation syndromes 4.Patients who are 24-48 h post burn or crush injury 5.Open globe injuries 6.Myalgia 6.Hyperkalemia?	1.Do not cause fasciculations 2.Much longer half-life 3. Hypersensitivity.

## Clinical question:

- Can rocuronium replace succinylcholine as the paralytic of choice for RSI in the ED?

## Evidence review

- PubMed to search terms were " succinylcholine and rocuronium "
- Limits on the search "Clinical trial,randomized controlled trial or meta-analysis and clinical journals "
- Four relevant studies

### 1. Rocuronium versus succinylcholine for rapid sequence induction of anesthesia and endotracheal intubation: a prospective, randomized trial in emergent cases. *Anesthesia and Analgesia*, 2005.[7]

- Material:**
  - Total : randomized = 234:180
  - Non-blinded, randomized, controlled trial
  - Intervention: Rocuronium 0.6 mg/kg
  - Control: S.C.C 1.0 mg/kg
  - Primary outcome: The numerical scale consisted of a nine-point grading system for intubating conditions,
  - Secondary outcome: Time to intubation
- Main result:**
  - The numerical grading score:**  
 S.C.C / Rocuronium =  $8.6 \pm 1.1$  :  $8.0 \pm 1.5$  , ( $P < 0.001$ )
  - Median time for intubation**  
 S.C.C / Rocuronium = 95s / 130s

### 2. Comparison of rocuronium and suxamethonium (succinylcholine) for use during rapid sequence induction of anaesthesia. *Anaesthesia*, 1998.[8]

- Material:**
  - Total : randomized = 348 : 314
  - Double-blinded, controlled trial
  - Intervention: Rocuronium was given in two doses (0.6 and 1.0 mg/kg). The better of the two doses was used to compare vs. control
  - Control: Succinylcholine 1.0 mg/kg
  - Primary outcome: Intubating conditions using a three-point scoring system (excellent, good, poor) were assessed by a blinded observer 50 s after the end of injection of the neuromuscular blocking drug. The primary outcome of the study was to compare the intubating conditions with the two doses of rocuronium.
  - Secondary outcome: Comparison of the better of the two doses of rocuronium with suxamethonium at a dose of 1.0 mg/kg.



■ **Main result:**

- **Grade intubating condition**  
Rocuronium 1.0 mg > 0.6 mg/kg ( $p < 0.01$ )
- **Clinically acceptable intubation conditions** (excellent plus good) was similar between S.C.C (96.2 %) and rocuronium (96.9 %)
- **Grade intubating condition**  
S.C.C / Rocuronium(1.0 mg/kg) = 80% / 65 % of patients, ( $p=0.02$ )

3. A comparison of succinylcholine and rocuronium for rapid sequence intubation of emergency department patients. *Academic Emergency Medicine*, 2000.[9]

■ **Material:**

- 520 patients
- A prospective cohort study
- Intervention: Rocuronium 1.0 mg/kg in pt with know or suspected hyperkalemia, signs of IICP, chronic neuromuscular dz, crush injury,
- Control: S.C.C 1.7 mg/kg
- Primary outcome: 10 points scales
  1. the pt's body movement
  2. vocal cord movement during intubation
  3. the physician's overall satisfaction with the extent of paralysis
- Secondary outcomes: 1. time from drug administration to paralysis, 2. the need for BVM ventilation, 3. the pulse oximetry reading, 4. any complications, 5. serum potassium



■ **Main result:**

- **Time from drug administration to paralysis**  
S.C.C / Rocuronium = mean of  $39 \pm 13$  s (range 20-129 s, 95% confidence interval [CI] 37-41 s) /  $44 \pm 20$  s (range 10-180 s, 95% CI 39-50 s) .( $p=0.04$ )
- **Extent of body movement (0-10)**  
S.C.C / Rocuronium = median of 10 (interquartile range [IQR] 9-10, mean  $9.1 \pm 1.1$ )/(IQR 9-10, mean  $9.1 \pm 1.5$ ). ( $p = 0.01$ )
- **Vocal cord movement (0-10)**  
S.C.C / Rocuronium = median of 10 (IQR 9-10, mean  $9.2 \pm 1.6$ )/9 (IQR 9-10, mean  $9.2 \pm 1.6$ ).( $p=0.15$ )
- **Physician's overall satisfaction with extent of paralysis(0-10)**  
S.C.C / Rocuronium = median of 10 (IQR 9-10, mean  $9.4 \pm 1.3$ )/10 (IQR 9-10, mean  $8.8 \pm 2.0$ ).( $P < 0.01$ )

4. Rocuronium versus succinylcholine for rapid sequence induction intubation. *Cochrane Database of Systematic Reviews*, 2008. [10]

■ **Material:**

- Any age of patients
- Systematic review
- Intervention: Serche of MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials. Foreign language journals and references were included.
- Primary outcome: Excellent intubating conditions (excellent, good and poor)
- Secondary outcomes: Clinically acceptable (excellent or good)
- **Main result:**  
58 studies identified and 37 were combined for analysis.  
Overall, succinylcholine was clinically superior as it has a shorter duration of action with relative risk = 0.86 (95% CI 0.80-0.92) (n=2690)



## Conclusion

- Succinylcholine remains the drug of choice for ED RSI unless there is a contraindication to its usage.

## Thanks for your attentions.

