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)

**Advantages**

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<tr>
<th>Succinylcholine</th>
<th>Rocuronium</th>
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<td>1. Rapid onset, short half-life and excellent intubating conditions</td>
<td>1. Curing less pain due to post-paralysis myalgia.</td>
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<td>2. No adverse cardiovascular effects</td>
<td>2. Useful when succinylcholine is contraindicated.</td>
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<td>3. Allow return of spontaneous respiratory function in 5-10 min</td>
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**Contraindications**

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<td>1. Post-paralysis pain due to the fasciculations</td>
<td>1. Do not cause fasciculations</td>
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<td>2. History of malignant hyperthermia</td>
<td>2. Much longer half-life</td>
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<td>4. Patients who are 24-48 h post burn or crush injury</td>
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<td>5. Open globe injuries</td>
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<td>6. Myalgia</td>
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<td>6. Hyperkalemia?</td>
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**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


   - **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 ± 1.1 : 8.0 ± 1.5, (P<0.001)
     - Median time for intubation
       - S.C.C / Rocuronium = 95s / 130s


   - **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)

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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

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Main result:

- **Time from drug administration to paralysis**
  S.C.C / Rocuronium = mean of 39 ± 13 s(range 20-129 s, 95% confidence interval [CI] 37-41 s)/44 ± 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 ± 1.1)/(IQR 9-10, mean 9.1 ± 1.5). (p = 0.01)

- **Vocal cord movement (0-10)**
  S.C.C / Rocuronium  = median of 10 (IQR 9-10,mean 9.2± 1.6)/9 (IQR 9-10,mean 9.2±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 ± 1.3)/10 (IQR 9-10, mean 8.8 ± 2.0). (P< 0.01)

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Conclusion

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

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Thanks for your attentions.