



## Rocuronium vs. Succinylcholine for Out-of-Hospital ETI

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### **Key Article**

- *Guilhard B, et al. Effect of rocuronium vs. succinylcholine on endotracheal intubation success rate among patients undergoing out-of-hospital rapid sequence intubation: A randomized clinical trial. JAMA. 2019; 322:2303-2312. (CURASMUR Trial)*

### **Background**

- RSI is the most widely recommended sedation technique for patients requiring emergency tracheal intubation
- Use of a NMBA improves overall intubating conditions and first-attempt success rates regardless of the choice of sedative
- Succinylcholine has traditionally been the preferred NMBA
- Rocuronium recently proposed as an alternative and has become a favorite in EM due to pharmacokinetic characteristics. When used at 1.2 mg/kg has similar onset to succinylcholine.
- Succinylcholine is associated with adverse events: hyperkalemia and increased O<sub>2</sub> consumption
- No randomized trial has compared these two NMBA in emergency settings

### **Objective**

- Compared rocuronium vs. succinylcholine use in emergency out-of-hospital intubation situations.

### **Study**

- Nationwide, single blind, randomized, non-inferiority clinical trial (non-inferiority threshold selected as 7%)
- Conducted at 17 out-of-hospital emergency medical units in France
- Patients blinded to intervention assignment, but physicians conducting the intubation were not blinded.
- EMS system in France is two-tiered. First level is BLS fire department service. Second level is an ALS unit that is staffed with a nurse (or CRNA) and an EM or anesthesiology physician.
- Patients

- Included
  - All out-of-hospital patients requiring emergency intubation
  - Included all conditions – trauma, dyspnea, coma, overdoses, and shock
- Excluded
  - < 18 years of age
  - Cardiac arrest
  - Pregnancy
  - Contraindication to rocuronium or succinylcholine
- Intervention
  - Randomized 1:1 to either the Roc or Succ group
  - Both groups received sedative induction and pre-oxygenation
    - Etomidate or ketamine were recommended as sedatives
  - Sellick maneuver recommended but optional
  - Intubation performed 60 seconds after administration of the paralytic agent
  - DL performed with a Mac blade
  - Bougie, intubating LMA, or crico allowed as needed
  - Maintenance sedation after intubation included benzo's, propofol, or opioids
- Outcomes
  - Primary: percentage of patients with successful first-attempt orotracheal intubation assessed by the physician and confirmed by capnography
  - Secondary
    - Cormack-Lehane grade
    - Overall difficulty of intubation process
    - Intubation conditions
    - Percentage of patients intubated by alternative techniques
    - Intubation-related complications in the first 15 min after intubation

## Results

- 1248 patients enrolled in the study/randomized
  - 1230 patients completed the trial and 1226 were included in the analysis
- Primary Outcome
  - Rocuronium Group: 74.6% (455/610)
  - Succinylcholine Group: 79.4% (489/616)
  - Did NOT meet noninferiority threshold
- Secondary Outcomes
  - No difference between groups for difficulty of intubation
  - No difference between the groups in the use of alternative intubation techniques (stylet, gum elastic bougie)
  - Intubation-related complications reported within 15 min after intubation were observed more frequently in patients in the succinylcholine group (23.2% vs. 18.2%)

## Limitations Identified by Authors

- Trial was not double-blinded – was the physician influenced by knowledge of which drug was administered
- Physician staffed ALS units in France – generalizable to other settings?
- Early intubation-related complications during out-of-hospital period were collected and later hospital complications were not evaluated.
- Patients intubated without a stylet or laryngoscope and with Mac blades – generalizable?
- Noninferiority margin of 7% selected by authors as best expert opinion