

Rocuronium for rapid induction of muscle relaxation compared to succinylcholine

Question
Should rocuronium be used instead of succinylcholine for rapid induction of muscle relaxation before emergency intubation in adult and children?

CONTEXT	Rapid sequence induction intubation
The rapid sequence induction technique (RSI) used during emergency tracheal intubation requires the use of a sedative induction anesthetic and a muscle relaxant. Under emergency and controlled settings, the most commonly used muscle relaxant is succinylcholine, a depolarizing agent of rapid onset and short duration. Rocuronium is a non-depolarizing muscle relaxant with a longer duration that has been proposed as an alternative to succinylcholine.	

INTERVENTION	Rocuronium for rapid sequence induction intubation
Excellence in intubation conditions: Succinylcholine was superior to rocuronium regarding excellence in intubation conditions. <i>Moderate Quality of Evidence.</i>	
Acceptable intubation conditions: Succinylcholine was superior to rocuronium regarding acceptable intubation conditions. <i>Moderate Quality of Evidence.</i>	
Excellence in intubation conditions (pediatric population): No differences between rocuronium and succinylcholine regarding excellence in intubation conditions. <i>Moderate Quality of Evidence.</i>	
Clinically acceptable intubation conditions (pediatric population): No differences between rocuronium and succinylcholine regarding acceptable intubation conditions. <i>Moderate Quality of Evidence.</i>	

Overview of the evidence	
Benefits	<p>A Cochrane Systematic Review included 37 RCT that compared rocuronium and any dose of succinylcholine for RSI (date of search: 2000). It found that induction with rocuronium lead to less frequency of excellent intubation conditions (36 RCT, 1948 events, RR 0.86, IC95% 0.80-0.92) and less acceptable intubation conditions (36 RCT, 2407 events, RR 0.96, IC95% 0.93-0.99).</p> <p>There were 33 RCT in adult population and 3 RCT in pediatric population. Results in the subgroup of adult population were fairly similar. In pediatric population there were no differences between treatments in leading to excellent intubation conditions (3 RCT, 199 events, RR 0.95, IC95% 0.85-1.05) or in leading to acceptable intubation conditions (3 RCT, 229 events, RR 0.95, IC95% 0.89-1.01), although the common estimates showed a trend to favor induction with succinylcholine.</p>
Risks	<p>No results about adverse events were considered in this systematic review. Given that rocuronium has a longer duration of action, increasing dosage can result in a higher incidence of adverse effects. The duration of action of rocuronium might be increased in patients with some conditions, such as myasthenia gravis or myasthenic syndrome, hepatic disease, neuromuscular disease, carcinomatosis, or severe cachexia.</p>
Applicability	<p>Succinylcholine creates excellent intubation conditions and should be used over rocuronium for RSI in adult populations. Rocuronium should be used only as a second-line treatment. Evidence for paediatric populations remains inconclusive.</p>
Comments	<p>There are moderate confidence in the results from studies due to heterogeneity (all population) and limited number of events (pediatric population). Nevertheless it seems that succinylcholine is superior (or at least similar) to rocuronium for rapid sequence induction during emergency tracheal intubation.</p>
Costs	<p>No studies on cost-effectiveness have been identified in the current literature.</p>

Perry JJ, Lee JS, Sillberg VAH, Wells GA. Rocuronium versus succinylcholine for rapid sequence induction intubation. Cochrane Database of Systematic Reviews 2008, Issue 2. Art. No.: CD002788. DOI: 10.1002/14651858.CD002788.pub2.

TABLE		GRADE Evaluation of Clinical Outcomes							
Number of studies (N)	Outcome	Comparisson	Type of Evidence	Quality	Consistency	Direct Evidence	Size of Effect	GRADE	Comments
36 (2609)	Excellence in intubation conditions	Rocuronium Succinylcholine	4	0	-1	0	0	Moderate	Significant heterogeneity
36 (2571)	Acceptable intubation conditions	Rocuronium Succinylcholine	4	0	-1	0	0	Moderate	Significant heterogeneity
3 (236)	Excellence in intubation conditions (pediatric population)	Rocuronium Succinylcholine	4	0	0	0	-1	Moderate	Limited number of events
3 (236)	Acceptable intubation conditions (pediatric population)	Rocuronium Succinylcholine	4	0	0	0	-1	Moderate	Limited number of events

Type of evidence: 4 = RCT; 2 = Observational; 1 = Non-analytic studies / Expert opinion