Succinylcholine vs. Rocuronium and the Role of Sugammadex in RSI

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Succinylcholine is currently the drug of choice as the paralytic for RSI in the Emergency Department. The major downside to succinylcholine is its known contraindications (denervation syndromes, patients 24-48 hours out from burns and crush injury, history of malignant hyperthermia and hyperkalemia, which is the matter of some debate). Non-depolarizing agents do not have the same contraindications and thus may be substituted for succinylcholine in cases where the patient has a contraindication. Rocuronium is the non-depolarizing agent most commonly used in the ED for RSI because its rapid onset (60 seconds) is similar to succinylcholine (45 seconds). However, the main difference between Rocuronium and succinylcholine is the duration of paralysis (6 minutes for succinylcholine vs. 45 minutes for Rocuronium).

The first article we reviewed from the Journal of Emergency Medicine looked at four studies comparing succinylcholine vs. rocuronium for RSI in ED patients and concluded that succinylcholine remains the drug of choice unless a contraindication exists. The second article from Academic Emergency Medicine was a retrospective study looking at the success of first-attempt intubation in the ED for succinylcholine compared to rocuronium. This article concluded that these medications were equivalent in their success rates.

The third and fourth articles were both from the anesthesia literature and discussed the use of Sugammadex, a drug specifically designed to reverse the effects of rocuronium. This medication is currently approved for this use in Europe but is currently not available in the United States. The principle behind this medication is that practitioners could use rocuronium, thus avoiding the known contraindications to succinylcholine, and have a reversal agent at hand (Sugammadex) that would allow rocuronium to be reversed should the patient’s paralysis need to be reversed. These articles both examined optimal dosing of Sugammadex (found to be 16mg/kg) and discussed potential adverse events associated with its use (primarily QT prolongation). They demonstrated that Sugammadex is able to reverse the paralytic effects of rocuronium. Both studies were done in healthy surgical patients.

Our discussion at Journal Club focused on the unclear role sugammadex would have in our current practice. Typically when we paralyze patients for RSI we do so without a plan to reverse paralysis should intubation be difficult. There is however potentially a role for reversal when subsequent physicians (neurosurgery, neurology) need to examine an intubated patient. We also discussed the need to be sure to provide adequate sedation to patients who receive long-acting paralytic agents in the ED.