# Clinical Considerations of Sugammadex

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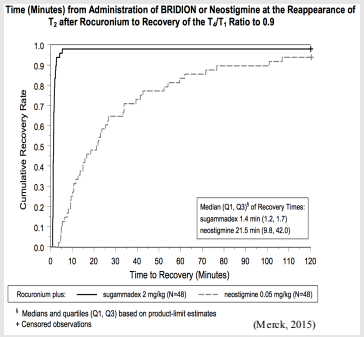
## Project Description

- The purpose of this research was to assess and improve the level of understanding of the newly FDA approved drug Sugammadex within the Adventist University Student Registered nurse anesthetist (SRNA) population regarding indications for use, dosing, pharmacological profile, and side effects of the new drug.
- Our goal was to increase knowledge of the students so that they would feel more comfortable using Sugammadex if the opportunity presented in the clinical setting or future practice.
- An extensive literature review was performed to create a thorough teaching module in the form of a Power Point presentation.
- Informed consent was obtained from audience.
- The module was presented to the SRNA students. A pre-test and post-test was given to evaluate whether the teaching on Sugammadex had been effective.
- Statistical analysis using a paired t-test showed that average scores increased significantly between pre-test and post-test scores.
- The Sugammadex teaching module turned out to be an effective tool that can be used to educate SRNAs.

## Literature Review

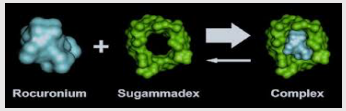
- The FDA approved Sugammadex for use in the United States in December 2015.
- A multi-centered study by de Boer et al. (2007) was conducted with 43 patients induced with Rocuronium 1.2 mg/kg. The study found that Sugammadex given 5 minutes after Rocuronium administration reduced the mean recovery time by 122 minutes.
- Reversal of a profound NMB induced by Rocuronium (1.2 mg/kg) with 16 mg/kg of Sugammadex was significantly faster than the spontaneous recovery from 1 mg/kg of Succinylcholine (Lee et al., 2009).
- Geldner et al. (2012) conducted a study of 140 participants evenly distributed into two groups, one receiving Sugammadex and the other Neostigmine. This study revealed that Sugammadex achieved recovery 3.4 times earlier than those that received Neostigmine.
- Recent research has shown prophylactic Dexamethasone for PONV does not interfere with reversal of moderate NMB (Buonanno et al., 2016).
- Sugammadex is physically incompatible with ondansetron, verapamil, and ranitidine, so flushing of the line is important when administering Sugammadex (Merck, 2015).



(Merck, 2015)

## Mechanism of Action

Modified gamma- cyclodextrin selective binding agent that binds to aminosteroidals by forming a tight complex encapsulating the unbound steroidal molecule, thus, preventing action at the neuromuscular junction (Jones et al., 2008).




## Dosing

| Train-of-Four | Post-Tetanic Count | Sugammadex Dose, mg/kg |
|---|---|---|
| 2/4 | - | 2 |
| 0/4 | 1-2 | 4 |
| 0 | 0 | 16 |

## Indications

- Rapid reversal of neuromuscular blockade (NMB) of Rocuronium and Vecuronium at different levels of blockade
- May be used when rapid reversal is necessary and paralytic effects are only desired for a short duration.
- Neuromuscular diseases
- Difficult airway
- "Can't intubate, ventilate" scenario
- Rescue of residual paralysis
- Neurophysiological monitoring
- Considerations in ECT
- Concerns of MH with Succinylcholine
- When avoidance of anticholinesterase side effects are desired.
- May be beneficial in anaphylactic reaction to aminosteroidal muscle relaxants

*References are attached to the back of poster and available upon request

## Results

- A total of 40 SRNAs participated in the study
- Statistical analysis was completed using a paired t-test (Figure 1) and a paired samples t-test was conducted to analyze the data (Figure 2).
- The obtained t-value was 10.009 with an associated p-value of less than the .05 level of confidence.
- The mean pre-test score was 5.9 with a standard deviation of 2.30718. In comparison, the mean post-test score was 9.275 with a standard deviation of 1.37724.
- The data demonstrates statistical significance between the pre-test and post-test scores.

Figure 1: Paired Samples Statistics

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Pre-Test | 5.9000 | 40 | 2.30718 | .36480 |
| | Post-Test | 9.2750 | 40 | 1.37724 | .21776 |

Paired Samples Test (Figure 2)

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Pre-Test - Post-Test | -3.37500 | 2.13262 | .33720 | -4.05705 | -2.69295 | -10.009 | 39 | .000 |

## Conclusions

- Demonstrated a statistically significant improvement from pre-test scores, indicating that the Power Point presentation on Sugammadex had been effective.
- One limitation of the study was that long term learning could not be evaluated due to time constraints. It is important to note, that the students had just received education in the clinical setting on Sugammadex from a drug representative, as the drug had just become available in the clinical setting the same week the presentation was given. Despite the additional education the students received, the students still had room for learning which was reflected in the pre-test scores.
- The Sugammadex teaching module is effective and can be used for SRNAs and possibly CRNAs in the future for management of complex patients and clinical scenarios.