Sugammadex versus conventional neuromuscular blockade reversal on surgical throughput times: a retrospective review

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- Research Medical Center (RMC)—Kansas City, Missouri
  - 590-bed tertiary care facility
    - Level I trauma center
    - Joint Commission Comprehensive Stroke Certified
    - Level IIIa NICU
    - 18 OR suites
      - Orthopedics
      - Neurosurgery
      - Cardiothoracic surgery
    - Grossman Burn Center
    - Kidney/pancreas transplant
    - Sarah Cannon Cancer Center
      - Autogeneic bone marrow transplant

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Project Background

- Three distinct meta-analyses conclude sugammadex is preferable to neostigmine for reversal of NMB[1,2,3]
  - Faster reversal
  - Lower risk of residual neuromuscular blockade after extubation
  - Lower likelihood of respiratory & cardiovascular adverse effects as well as postoperative weakness
- One meta-analysis determined that postoperative discharge was accelerated – from the operating room to the post-anesthesia care unit (PACU); however, the underlying randomized trial only assessed laparoscopic cholecystectomy procedures (n=34)[2,4]
- Prior to this project start, published studies had not analyzed the time from NMB reversal to PACU discharge for all types of surgical operations

NMB = neuromuscular blockade
PACU = post-anesthesia care unit

Reversal Administration to PACU

- Primary objective
  - NMB reversal administration time to PACU admission
- Secondary objectives
  - Total time in PACU
  - NMB reversal administration time to PACU discharge
- Requires a case-by-case analysis of surgeries where neostigmine and sugammadex are used for NMB reversal

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PACU = post-anesthesia care unit

Methods

- Data was mined from an automated dispensing cabinet for operating room withdraws of sugammadex and/or neostigmine (10/1/18 – 3/31/19)
- Analysis of the data generated a list of approximately 2,000 withdrawal instances
- 150 patients were randomly selected from both groups
- Patient charts were examined and the necessary data extracted for purposes of the study

Inclusion and Exclusion Criteria

Inclusion	Exclusion
Patients undergoing surgical procedure(s) where the following paralytic drug was used: Rocuronium	< 18 years of age
	Pregnancy
	Prisoner status
	CrCl < 30 mL/min
	Incomplete anesthesia logs
	Illegible anesthesia logs

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Study Results and Recommendations

- Mann–Whitney U-test
- Primary endpoint
  - The median time from NMB reversal administration to admission to the PACU was significantly less for sugammadex compared to neostigmine
    - 17 minutes vs 22 minutes, respectively; $p < 0.05$
- Secondary endpoints
  - Total median time in PACU
    - 78 minutes compared to 76 minutes, respectively; $p = 0.64$
  - Administration of NMB reversal to PACU discharge
    - 92 median minutes compared to 100 median minutes, respectively; $p = 0.14$

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PACU = post-anesthesia care unit

Study Limitations

- High number of excluded patients due to incomplete data in hand-written case records
- Non-blinded & open-label
- Patients who received sugammadex tended to have more pre-anesthesia medical co-morbidities

Summary

- Previous evidence suggests that sugammadex is a safer alternative to neostigmine and provides a faster time to resolution of NMB[1,2,3]
- This study indicates that sugammadex decreases the time from NMB reversal to OR discharge
- The time saved by using sugammadex in all surgical procedures may lead to increased throughput and a net cost savings. Further study is warranted.

NMB = neuromuscular blockade
OR = operating room

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