SUGAMMADEX VERSUS NEOSTIGMINE AND GLYCOPYRROLATE IN POST-ANESTHESIA CARE UNIT LENGTH OF STAY: A RETROSPECTIVE STUDY AT ELLIS HOSPITAL

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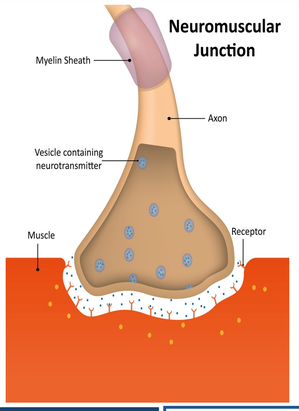
Background

- Reversal of neuromuscular blockade is a critical step for safe recovery from anesthesia.
- Traditionally, neostigmine and glycopyrrolate have been among the most commonly used medications used to reverse neuromuscular blockade.
- Sugammadex is a selective relaxant binding agent that creates a complex with rocuronium and vecuronium.
- Advantages of Sugammadex include rapid recovery regardless of the depth of the blockade and lack of cholinergic side effects.
- A disadvantage of Sugammadex is increased cost.
- Sugammadex cost is $54 per mL compared with Neostigmine combined with Glycopyrrolate is $3 per mL.



Purpose

- The purpose of this study is to compare PACU LOS in bariatric patients at Ellis Hospital who received Sugammadex vs. Neostigmine/Glycopyrrolate for reversal of neuromuscular blockade after general anesthesia.

Methods

- Observational retrospective cohort study.
- Chart review included patients who underwent general anesthesia for bariatric surgery between 2015 – 2019 at Ellis Hospital.
- A population size of 152 (76 for each group) was determined by the G Power Analysis Tool.
- Inferential analysis was performed with an unequal variance t-test.

Results

A power analysis determined that sufficient sample size= 152 subjects

The characteristics between groups were similar with the exception of procedure type
Gastric Sleeve $p = 0.001$
Gastric bypass $p = 0.0001$

Mean LOS was 16.2 minutes longer in the Sugammadex group *(p = 0.001)*

The average PACU LOS was 16.2 minutes longer in the Sugammadex group compared to the Neostigmine and Glycopyrrolate group. The Sugammadex group had a wider range of PACU LOS. The unequal variance *t*-test result was 2.66 with a *p*-value of *0.00862*.

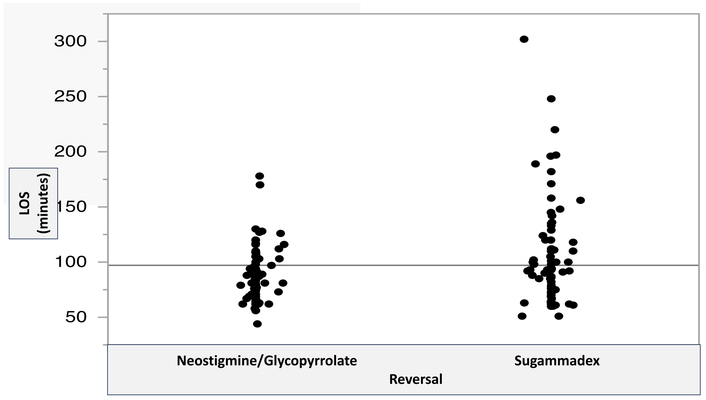
PACU LOS (minutes)	N	Mean	Median	Standard Deviation	Minimum	Maximum	Variance	*t*-Test	*p*-Value
Overall	152	96.2	88.5	38.3	44	302		2.66	***0.00862***
Neostigmine/ Glycopyrrolate	76	89	83.5	24.1	44	178	589.8		
Sugammadex	76	105.2	93	46.9	51	302	2229.2		

Characteristics		Sugammadex	Neostigmine/ Glycopyrrolate	*z*-Value	*p*-Value
Gender	Male	12	8	0.9598	*0.33706*
	Female	64	68	-0.9598	*0.33706*
Age	18-20	0	1	-1.0033	*0.31732*
	21-30	17	12	1.0321	*0.30302*
	31-40	15	25	-1.842	*0.06576*
	41-50	25	21	0.7062	*0.4777*
	51-60	9	11	-0.4799	*0.33706*
	61-70	10	6	1.0572	*0.28914*
ASA Status	1	0	0	NaN	***<0.00001***
	2	18	14	0.7958	*0.42372*
	3	58	62	-0.7958	*0.42372*
BMI	31-40	31	27	0.6679	*0.50286*
	41-50	31	36	-0.8169	*0.41222*
	51-60	11	13	-0.4449	*0.65994*
	61-70	3	0	1.7494	*0.08012*
Procedure Type	Gastric Sleeve	24	44	-3.2626	***0.00112***
	Gastric Band	9	6	0.8159	*0.41222*
	Gastric Bypass	46	23	3.747	***0.00018***
Paralytic Agent	Rocuronium	69	73	-1.3087	*0.1902*
	Vecuronium	7	3	-1.3087	*0.1902*

Discussion

Many anesthesia providers regard Sugammadex as the safer and more efficacious reversal agent than Neostigmine and Glycopyrrolate. In this analysis, patients who received Neostigmine and Glycopyrrolate had shorter PACU LOS. Various factors could have contributed to this finding:

- Potential variation in surgeons, surgery techniques, and PACU protocol.
- Significant differences between procedure type could impact PACU LOS.
- Clinically significant increase in Sugammadex use in the 61-70 BMI range.
- The introduction of the novel drug may have changed providers approach to dosing and timing of paralytic and reversal agents.



Strengths and Limitations

- Strengths: statistical significance, sufficient sample size, complete data collection.
- Limitations: Retrospective design limits the ability to control variables.
  - Limited generalizability due to patient population and monocenter design.
  - Three outliers in the Sugammadex group could skew mean PACU LOS.
  - Length of surgery and amount of paralytic were not recorded.

Future Research

Future research related to this topic can be completed on OR length of stay after the administration of the reversal agent and amount of paralytic used throughout the case.

References