



Pregnancy Outcomes Associated with Sugammadex Reversal of Neuromuscular Blockade in Pregnant Patients Undergoing Non-Obstetric Surgery During Pregnancy



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INTRODUCTION

Non-obstetric surgery during pregnancy is common. Sugammadex (SGX) is a novel cyclodextrin agent, capable of reversing profound steroidal nondepolarizing neuromuscular blockade quickly and with fewer side effects than neostigmine (NEO)¹. In-vitro studies show SGX binds other steroids, including progesterone, a vital hormone in maintaining pregnancy¹⁻⁴. It is uncertain whether SGX is safe in pregnancy, and guidelines currently recommend avoiding it until better data is available^{4,5}. This study assessed pregnancy outcomes after SGX vs. NEO exposure during non-obstetric surgery during pregnancy. We hypothesized that gestational age and rates of pregnancy loss after surgery would be different between people receiving SGX and NEO for non-obstetric surgery during pregnancy.

METHODS

- Retrospective cohort study
- Pregnant women with UPMC insurance receiving obstetric care and surgery within the UPMC Health System from 2015-2019, a period where little published guidance existed for SGX use in pregnancy
- Patients having general anesthesia for non-obstetric surgery during pregnancy and receiving either SGX or NEO were identified
- Patients were included if reversal exposure occurred during a documented live pregnancy
- Medical records were used to abstract data including non-obstetric surgery types, gestational age at reversal exposure, maternal age, and labor and delivery variables
- The primary endpoints of interest were gestational age at delivery and rates of pregnancy loss after exposure
- Descriptive statistics were performed between groups, and multivariable logistic regression compared gestational age and pregnancy loss outcomes between groups
- A P<0.05 defined statistical significance.

RESULTS

- 835 non-obstetric surgeries under general anesthesia during the study period
- 745 excluded due to non-viable pregnancy at the time of reversal exposure (e.g., cases of laparoscopic salpingectomy for ectopic pregnancy) or for incomplete data.
- 90 patients were included in final analysis (78 NEO, 12 SGX)
- Demographic information and surgical types are summarized in the Table. The mean gestational age at delivery was similar between groups: 37.5±4.6 weeks in the NEO group and 36.5±4.6 weeks in the SGX group (P=0.48). Rates of pregnancy loss were similar between groups, with 4 pregnancy losses (5.1%) in the NEO group and 0 (0%) in the SGX group (P=1.00).

	Neostigmine	Sugammadex	P-value
Demographic Information	(n = 78)	(n = 12)	
Patient age (years)	28.3 (5.4)	25.2 (7.2)	0.57
ASA physical status exposure	2 [1]	2 [1]	0.48
EGA at reversal exposure (weeks)	19.3 (8.2)	18.9 (7.3)	0.98
Type of surgery			
General	56 {71.8%}	5 {41.6%}	0.85
Gynecologic	17 {21.7%}	4 {33.3%}	
Urologic	3 {3.8%}	2 {16.7%}	
Reproductive	1 {1.3%}	0 {7.7%}	
Trauma	1 {1.3%}	0 {0%}	
Orthopedic	0 {0%}	1 {8.3%}	
Primary Results			
Pregnancy loss	4 {5.1%}	0 {0%}	1.00
Gestational age at delivery	37.5 (4.6)	36.5 (4.6)	0.48
Delivery type, live births	N=74	N=12	
Spontaneous	42 {55.3%}	8 {66.7%}	0.85
Cesarean	29 {38.2%}	4 {33.3%}	
Operative	3 {3.9%}	0 {0%}	
Labor & Delivery Characteristics			
Pre-eclampsia	7 {9.6%}	1 {8.3%}	1.00
Gestational hypertension	7 {9.6%}	1 {8.3%}	1.00
Gestational diabetes	5 {6.8%}	0 {0%}	1.00
Abnormal placentation	1 {1.3%}	1 {8.3%}	0.26
Placenta previa	2 {2.7%}	1 {8.3%}	0.37
IUGR	3 {4.1%}	0 {0%}	1.00
Fetal anomaly	2 {2.7%}	1 {8.3%}	0.37
Neonatal intensive care required	11 {14.9%}	3 {25.0%}	0.40
Length of hospital stay (days)	3.1 (1.9)	3.4 (2.0)	0.65
Neuraxial analgesia for labor	46 {62.2%}	9 {75.0%}	0.52
Delivery estimated blood loss (mL)	445.8 (351.1)	596 (734)	0.25
Postpartum hemorrhage procedure	2 {2.7%}	1 {8.3%}	0.37

Data are presented as mean (standard deviation), median [IQR], or frequency [%]

Table. Demographic information and primary results.

SUMMARY

- In this cohort there was no evidence of differences in delivery gestational age or frequency of pregnancy loss between patients receiving SGX vs. NEO for non-obstetric surgery during pregnancy
- These data support pursuing future prospective trials of randomized designs to definitively answer questions about SGX safety in pregnant patients undergoing non-obstetric surgery during pregnancy.

Gestational age at delivery and frequency of pregnancy loss are similar between patients receiving SGX and NEO for non-obstetric surgery during pregnancy.

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