Title
Association of patient and clinical characteristics with prolonged cesarean delivery operative time: a single center retrospective study

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BACKGROUND & HYPOTHESIS

- Background: Evaluating and understanding patient and clinical factors associated with prolonged cesarean delivery times is key to recognizing risk factors for excessive operative durations and identifying considerations for more effective and efficient surgical suite planning.
- Hypothesis: This study aims to identify clinical and demographic factors associated with prolonged cesarean delivery operative times, with the goal of discovering and highlighting variables that may independently predict increased surgical duration.

STUDY DESIGN AND METHODS

- Study Design: Retrospective cohort study.
- Population: Patients undergoing primary or repeat cesarean delivery at Baylor Scott and White Temple between July 1st 2023 to June 30th 2024.
- Data Collection: Patient demographics, clinical history, and operative details.
- Fastest quartile = shorter operative time cohort, Slowest quartile = longer operative time cohort
- Statistical Methods: Bivariate analysis followed by a multivariate logistic regression that was used to identify factors associated with prolonged operative time.

RESULTS

Table 1. Demographic, physical, and clinical characteristics of the cohorts

Variable	Shorter operative time (N=231)	Longer operative time (N=220)	P value
Race			0.27
Black	*39 (17%)*	*49 (22%)*	
Hispanic	*77 (33%)*	*75 (34%)*	
White	*115 (50%)*	*96 (44%)*	
Insurance			0.07
Medicaid	*99 (43%)*	*115 (52%)*	
Tricare	*21 (9%)*	*24 (11%)*	
Commercial	*109 (48%)*	*81 (37%)*	
Area Deprivation Index (median (IQR))	66 (53-79)	65 (50-78)	0.26
Height (cm) (median (IQR))	160.1 (157.5-167.4)	162.5 (157.5-167.5)	0.25
Weight (kg) (median (IQR))	85.3 (76.2-99.2)	99.7 (87.4-115.9)	**<0.001**
Body mass index (kg/m^2) (median (IQR))	33.8 (29.4-38.1)	37.9 (33.6-44.0)	**<0.001**
Gravidity (median (IQR))	2 (1-4)	3 (2-4)	**0.03**
Parity (median (IQR))	1 (0-2)	1 (0-2)	**0.002**
Gestational age (weeks) (median (IQR))	38.0 (36.1-39.3)	37.8 (36.7-39.1)	0.78
History of cesarean delivery (yes)	91 (39%)	117 (53%)	**0.003**
History of prior abdominal surgery (yes)	29 (13%)	49 (22%)	**0.006**
Hypertension of any kind (yes)	81 (35%)	108 (49%)	**0.002**
Abdominal incision			**0.03**
Pfannenstiel, elliptical, or low transverse	*231 (100%)*	*215 (98%)*	
Vertical midline	*0*	*5 (2%)*	
Uterine incision			**0.001**
High transverse or low transverse	*231 (100%)*	*211 (96%)*	
Classical	*0*	*9 (4%)*	
Emergency obstetric indication (yes)	14 (6%)	6 (3%)	0.09
Tubal ligation performed (yes)	25 (11%)	70 (32%)	**<0.001**
Operative time (minutes) (median (IQR))	33 (30-35)	63 (58-70)	**<0.001**
Quantitative blood loss (ml) (median (IQR))	436 (303-627)	668 (444-898)	**<0.001**

Table 2. Multivariate logistic regression to predict whether a patient was in the longer operative time cohort

Variable	Units	Odds ratio	95% Confidence intervals		P value
Insurance					
Commercial (reference)	N/A	1.0			
Tricare	N/A	1.61	0.78	3.33	0.19
Medicaid	N/A	1.55	1.00	2.41	0.05
Body mass index	5 kg/m^2	1.59	1.36	1.87	**<0.001**
Parity	1	1.01	0.83	1.22	0.93
History of cesarean delivery	N/A	1.27	0.79	2.04	0.33
History of prior abdominal surgery	N/A	1.45	0.82	2.52	0.21
Hypertension of any kind	N/A	1.16	0.76	1.80	0.49
Tubal ligation performed	N/A	3.12	1.78	5.49	**<0.001**

- 933 cesarean deliveries in study period
- **Fast** operative time cohort: **21-37 minutes**
- **Slow** operative time cohort: **51-161 minutes**
- **Tubal ligation** (aOR 3.12; 95% CI 1.78-5.49; p<0.001)
- **BMI** (aOR 1.59; 95% CI 1.36-1.87; p<0.001):
- C-statistic: 0.75

CONCLUSION AND DISCUSSION

- Tubal ligation and BMI were independently associated with longer operative times
- Implications: Findings can guide preoperative risk stratification and surgical planning in obstetric anesthesia.
- Limitations: Retrospective design and potential confounders such as surgical technique variability.
- Future Directions: Further prospective studies to validate findings and assess intraoperative factors influencing operative time.

References
1. Girsen AI et al. Body mass index and operative times at cesarean delivery. Obstet Gynecol 2014;124:684-689