

Comparing the Nulliparous, Term, Singleton, Vertex Cesarean Delivery Rate between Hospital-Based and Private Groups in a Community Hospital Setting

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Introduction

Although cesarean delivery can be lifesaving for the fetus, the mother, or both in certain cases, the rapid increase in cesarean births without evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concern that cesarean delivery is overused. The California Maternal Quality Care Collaborative (CMQCC) developed the Nulliparous, Term, Singleton Vertex (NTSV) Cesarean Birth Rate as a measure to assess cesarean deliveries in a standardized low-risk, first-time mothers. NTSV rate is considered a quality measure related to health outcomes and healthcare cost reduction.

The most common inductions for primary cesarean delivery include labor dystocia, abnormal fetal heart rate tracing, fetal malpresentation, multiple gestations, and suspected fetal macrosomia. Multiple techniques have been implemented to prevent cesarean deliveries, including revised definitions of first and second-stage labor dystocia, interventions to improve category II tracings, and continuous labor support.

Rationale and Aims

A review of our recent data at St. Francis reveals an NTSV cesarean delivery rate above 30%. This rate appears to vary by prenatal practice. The hospital aims to lower the primary cesarean rate without compromising patient safety. Our goal is to determine the NTSV cesarean rates at St. Francis over the past eight years and assess factors associated with increased cesarean delivery rates. This evaluation will allow us to create strategies that directly target these factors and improve patient pregnancy outcomes.

Study Design and Results

Demographics	Hospitalist, n (%)	Private, n (%)	P value
Age	26.3	28.5	P<0.0001
BMI (Kg/m ²)			P<0.0001
<25	323 (17.95)	1852 (35.7)	
25.0-29.9	550 (30.6)	1279 (24.67)	
>30.0	926 (51.5)	2053 (39.6)	
Gestational Age (days)	276.8	277.4	P=0.005
Race			P<0.0001
White	570 (31.7)	2643 (50.9)	
African American	608 (33.8)	941 (18.2)	
Other	611 (33.9)	1573 (30.3)	
Unknown	10 (0.6)	27 (0.5)	
Ethnicity			P<0.0001
Hispanic	487 (27.1)	660 (12.7)	
Non-Hispanic	1309 (72.8)	4507 (86.9)	
Insurance			P<0.0001
Medicaid	1050 (58.9)	1522 (29.5)	
Private	730 (41.0)	3642 (70.5)	

Table 1: Patient Demographics

24,025 deliveries from patients aged 18 to 49 who delivered between January 1, 2014 and December 31, 2022 were analyzed. 6,944, NTSV deliveries were identified. The overall and group NTSV CD rate was calculated. Risk factors including maternal age, obesity, race/ethnicity, and insurance type were analyzed. A multivariable log-linear regression was performed to control for all patient factors when comparing outcomes.

Patient Factor	NTSV CD Rate (%)	Odds Ratio	95th% CI
N = 6944			
Age (years)	29.2	1.076	1.064-1.089
Pre-Delivery BMI	25-29.9	1.032	0.897-1.188
	>30.0	1.652	1.457-1.873
Race	African American	1.589	1.370-1.842
	Other	1.178	1.030-1.348
Ethnicity	Hispanic	1.221	1.030-1.449
Insurance Status	Medicaid	1.018	0.893-1.161
Prenatal Care	Hospitalist	0.635	0.558-0.722

Table 2: Patient Outcomes – NTSV Rates and Risk by Patient Factor

Discussion

Of the 24,025 deliveries, 6,944 met NTSV criteria. Their cesarean rate was 34.9%. The NTSV cesarean rate was higher for patients who were in the private groups (37.1% vs. 28.4%, p<0.001). Even when controlling for all factors, our study shows that delivering with the hospital-based group leads to a lower risk of cesarean delivery (OR 0.635, CI 0.56-0.72). Previous studies have shown that the laborist model with full-time in-house coverage has led to lower cesarean delivery rates. This is a similar model that is implemented with the hospital groups at St. Francis Hospital.

The demographics of the hospital-based groups show a more obese and diverse population. When controlling for all other factors, obese patients had a higher risk of cesarean delivery (OR 1.652, CI 1.457-1.873). African Americans and Hispanics also had a higher risk of cesarean delivery (OR 1.589, CI 1.370-1.842; OR 1.221, CI 1.020-1.449). The hospital-based groups also had a higher rate of Medicaid insurance status compared to private groups however this was not a significant risk factor for cesarean delivery (OR 1.018, CI 0.893-1.161).

Conclusion and Future Directions

Although the hospital-employed group served a higher-risk and more diverse population, they had a lower NTSV CD rate and contributed to improved health outcomes and less disparity in care.

We now have evidence that the hospital group cesarean delivery is lower than in the private groups however the reason for this discrepancy is unknown. We plan to investigate the reason for the cesarean deliveries and determine if there is a difference in reason for cesarean delivery between the groups. Based on this data we can implement strategies to help reduce the overall NTSV rate to reach the CMQCC goals.

NTSV Rate by Year, 2014-2022

