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Race, Insurance Status, and Nulliparous, Term, Singleton, Vertex Cesarean Indication: A Case Study of a New England Tertiary Hospital

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A B S T R A C T

Introduction: The current U.S. cesarean section rate (32.2%) is recognized as too high in light of its negative health impacts on women and infants. Efforts are underway in several states and individual hospitals to lower the rate of cesarean section among low-risk women, defined as nulliparous (first birth), term (≥37 weeks gestation), singleton (one baby), vertex (head down presentation; NTSV).
Objectives: We conducted a case study of one hospital's experience with NTSV cesarean sections to see whether race and insurance status affect the probability of cesarean indication. Many cesarean indications are ambiguous, and biases may seep into decisions with ambiguous diagnoses.
Methods: We conducted a retrospective chart review of women who had NTSV cesarean sections at a tertiary care hospital in an urban New England city between June 2013 and November 2013. We analyzed the data using multinomial logistic regression to examine the marginal effect of race and health insurance status on the predicted probability for NTSV cesarean indication.
Results: We find that Black and Hispanic women have a lower predicted probability of having a cesarean section for cephalopelvic disproportion than do White women and that women with private health insurance have a lower predicted probability of having a cesarean section for nonreassuring fetal heart rate and for a clinical indication than do women without private health insurance.
Discussion: We suggest biases may seep into clinicians' decisions to perform an NTSV cesarean section. Hospital quality improvement efforts are aided by an examination of sociodemographic factors that influence clinician decision making in the specific hospital being studied.

Since 1970, the U.S. cesarean delivery rate has increased by almost 500%. In 2014, 32.2% of women gave birth by cesarean (Hamilton, Martin, Osterman, & Curtin, 2015). Cesarean sections are the most common major surgery performed in hospitals across the United States (Podulka, Stranges, & Steiner, 2011).

Despite the increase in cesarean delivery, maternal and fetal outcomes have not improved (Spong, Berghella, Wenstrom, Mercer, & Saade, 2012). Cesarean delivery leads to a higher risk of complications for women and their babies compared with vaginal birth. Complications to the baby include accidental surgical injury, respiratory problems, and prematurity (this occurs especially with scheduled cesareans, since gestational age, or "estimated due date," is not always accurate; Dessole et al., 2004; Gerten, Coonrod, Bay, & Chambliss, 2005; March of Dimes, 2008). Complications to women include infection, hemorrhage, blood

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clots, blood loss, surgical injury, adverse reactions to anesthesia, and increased risk of placental complications in subsequent pregnancies (Deneux-Tharaux, Carmona, Bouvier-Colle, & Breart, 2006; Goer, Romano, & Sakala, 2012; Villar et al., 2007). Cesarean delivery may also hinder breastfeeding success (Zanardo et al., 2010).

A current maternal health initiative emphasizes reducing cesarean deliveries among women who are nulliparous (have not previously given birth), term (≥37 weeks gestation), with a singleton (one) fetus, in a vertex (head down) presentation (Spong et al., 2012), referred to as NTSV cesarean sections. Reducing primary (or first) cesarean sections has the potential to significantly lower the overall cesarean delivery rate since they comprise half of all cesarean deliveries. Further, The Joint Commission has identified the NTSV cesarean section rate as an important indicator of quality of medical care.[1] Since 2014, The Joint Commission has required hospitals with more than 1,100 annual births to report their NTSV cesarean birth rate, and, since January 2016, has required hospitals with more than 300 annual births to report this rate. Further, a major reason for the public health focus on NTSV cesarean sections is their impact on future births: nearly all women who have given birth by cesarean section will have a repeat cesarean in subsequent pregnancies, owing to the limited availability of vaginal birth after cesarean in U.S. hospitals. Prior cesarean section is the single largest contributor to the increase in the U.S. cesarean rate (Barber et al., 2011).

Our contribution to this topic is a case study of one hospital's experience with NTSV cesarean deliveries just before The Joint Commission required hospital reporting. We conducted a retrospective chart review at a tertiary care hospital in an urban city in New England. Our research focus is on the indication for the cesarean delivery. Because physician discretion as well as other factors, including maternal and fetal health status, are involved in decisions to perform a cesarean, we were interested in whether race and insurance status affect the probability of particular indications for cesarean delivery. Biases may seep into clinician decisions (Barber et al., 2011). Some NTSV cesarean sections may be performed with little medical justification, and research has shown an increased risk for African American women (Caughey, Cahill, Guise, Rouse, & American College of Obstetricians and Gynecologists, 2014; Getahun, 2009). If women's race or insurance status influences indication for cesarean delivery, this information may be used to guide quality improvement (QI) efforts and health care provider education.

Material and Methods

We conducted a retrospective chart review of NTSV cesarean deliveries performed at a tertiary care hospital in an urban New England city between June 1, 2013, and November 30, 2013. The first three authors were responsible for data collection and received institutional review board approval from the hospital and Trinity College, the authors' institution at the time of data collection. The hospital does not have an entirely electronic system of medical records, necessitating a multistep data collection process. We identified women who met the NTSV criteria by reviewing the birth log (paper record). We then used the associated patient record numbers to request women's medical records, which included electronic records as well as scanned copies of handwritten records and notes. Although it would be interesting to examine factors that affected whether NTSV women had cesarean sections or vaginal births, we do not have data on NTSV women who had vaginal births, because we did not have the time or resources to collect data on all NTSV deliveries.

This hospital had 1,839 deliveries and 1,874 babies born from June 1, 2013, through November 30, 2013. Of these deliveries, 1,193 (64.9%) were vaginal and 646 (35.1%) were cesarean (313 or 49% repeat cesarean sections and 333 or 51% primary cesarean sections; Figure 1). We identified 139 patients who had NTSV cesarean sections or approximately 42% of the primary cesarean sections.

We collected data from the medical records on the indication for the cesarean and on patients' race and health insurance status. Health insurance status is the most accessible and reliable indication of socioeconomic status in the patient medical record. The outcome is measured as one of four indications for cesarean delivery. We categorized three indications as discretionary—arrest in labor, nonreassuring fetal heart rate, and cephalopelvic disproportion (CPD)—because of the variability among clinicians in determining whether a cesarean section is required for these indications and because the increase in primary cesarean deliveries has been attributed to these indications in previous research (Barber et al., 2011; Getahun et al., 2009). The fourth indication relates to a medical reason for a cesarean section. We categorized this indication as more objective than the other three indications because, although also subject to the inherent uncertainties of clinical diagnoses, medical indications have not been shown to affect the increase in the cesarean section rate in institutions over time (Barber et al., 2011).

The discretionary aspect of diagnosing arrest in labor is related to temporal factors. The American College of

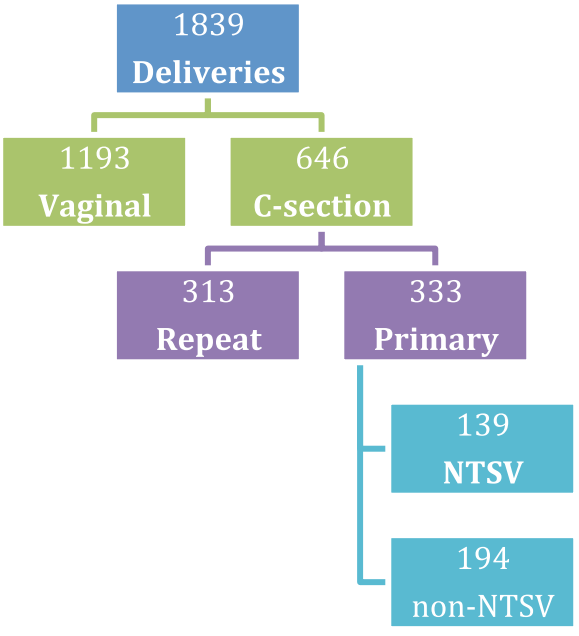

Figure 1. Modes of delivery (June 2013–November 2013). NTSV, nulliparous (first birth), term (≥37 weeks gestation), singleton (one baby), vertex (head down presentation).

[1] Although some researchers argue that the NTSV cesarean section rate may be considered a quality indicator for obstetric care, not all agree with this designation (Gibson & Bailit, 2015; Main et al., 2006; Snowden, Cheng, Kontgis, & Caughey, 2012).