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Concordance between Women's Self-Reported Reasons for Cesarean Delivery and Hospital Discharge Records

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A B S T R A C T

Background: Women's self-reports of whether they had a cesarean delivery are nearly 100% accurate, but there is little extant research on how accurately women self-report reasons for cesarean delivery when asked to recall this information in the postpartum period.
Objective: We compared women's self-reported reasons for cesarean with their hospital discharge records and examined correlates of variability in agreement between sources.
Methods: Data are from the First Baby Study, a cohort of 3,006 women who gave birth to their first baby between 2009 and 2011. Survey data were linked to hospital discharge records. Among women who delivered by cesarean ($n = 846$), we assessed the probability that women's self-reported reasons for cesarean delivery were confirmed by hospital discharge records (positive predictive value [PPV]), and whether agreement differed by reason for cesarean or by women's characteristics.
Results: Overall, 91% of women reported a reason for their cesarean that was present in the discharge data. PPV varied by reason for cesarean, with high PPV for dystocia, macrosomia, and cephalopelvic disproportion (91.1%), and lower PPV for malposition (81.7%). In multivariable models, women with more education and higher family income had higher odds of concordance.
Conclusions: Despite some variation in the probability that women's self-reported reason for cesarean is supported by the hospital discharge record, more than 90% of women reported a reason that was found in their discharge record. Accurate recall of reasons for prior cesarean may help women and clinicians to manage future pregnancies.

The current U.S. cesarean delivery rate of 32% has been widely recognized as too high, with negative health consequences for women and infants (American College of Obstetricians and Gynecologists, 2014; Hamilton et al., 2015). Reducing the cesarean rate among low-risk women is a national public health goal (U.S. Department of Health and Human Services, 2012). Information about why women are delivering by cesarean is important in efforts to reduce cesarean rates, because some cesarean indications, such as labor arrest and nonreassuring fetal heart tracing, are more subject to the discretion of individual providers and variation in labor management style (American College of Obstetricians and Gynecologists, 2014; Barber et al., 2011), but information on the reason for cesarean is not routinely collected in most data sources. U.S. birth certificates, for example, document delivery mode as well as some but not all conditions that may be indications for cesarean delivery. Survey data capture aspects of women's experiences in maternity care that cannot be assessed using other types of data. Some survey data sources—including the Listening to Mothers surveys, the

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National Survey of Family Growth and the Pregnancy Risk Assessment Monitoring System for certain states—have included questions about reason for cesarean (Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013; "National Survey of Family Growth," n.d., "Pregnancy Risk Assessment and Monitoring System," n.d.). However, it is unknown how women's self-reports of this information correspond with other data sources.

Additionally, the accuracy of women's self-reported reason for cesarean may have implications for decisions about vaginal birth after cesarean (VBAC). The likelihood of a successful VBAC varies depending on the reason for the primary cesarean delivery (Fagerberg, Maršál, Ekström, & Källén, 2013; Grobman, Lai, Landon, & Spong, 2007; Landon et al., 2005). During a subsequent pregnancy, a woman's prior medical record may not always be available, because women of childbearing age may move or switch clinicians between pregnancies (Hopkins et al., 2007). Knowledge of how accurately women report the reason for a previous cesarean may be helpful to clinicians in approaching conversations with women about their options for delivery mode and chances of a successful VBAC during subsequent pregnancies.

Previous research has found that women report whether they had a cesarean delivery with nearly 100% accuracy (Bat-Erdene, Metcalfe, McDonald, & Tough, 2013; Buka, Goldstein, Spartos, & Tsuang, 2004; Hopkins et al., 2007; Quigley, Hockley, & Davidson, 2007). The accuracy of women's self-reports of other events during labor and delivery depends on the specific event. A 2012 study found high levels of agreement between medical records and women's own reports of several aspects of their birth experiences, including whether their labor was spontaneous or induced, use of pain medications, and the baby's birthweight, whereas agreement was lower for reports of women's position during pushing and duration of pushing (Gartland, Lansakara, Flood, & Brown, 2012). An earlier U.S.-based study found reasonable concordance between maternal and medical record reports of operative delivery, episiotomy, and stitches, but poor concordance for external anal sphincter injury (Elkadry, Kenton, White, Creech, & Brubaker, 2003). Moreover, this study also examined whether concordance varied by sociodemographic and delivery characteristics, and found that women were more likely to misreport events if they were younger, African American, or if more time had elapsed since their delivery (Elkadry et al., 2003).

Little research has assessed how accurately women self-report reasons for cesarean delivery. To our knowledge, there is only one prior study on this topic, which was conducted among women who delivered via cesarean at a teaching hospital in Scotland in 1986 (Hillan, 1992). The researchers compared women's self-reported reasons for delivering by cesarean at 3 months postpartum with medical records; 74% of women reported a reason for cesarean delivery that the researchers coded as "correct," and an additional 14% of women reported a reason for cesarean delivery that the researchers coded as "partially correct." No information is reported on accuracy of specific reasons (Hillan, 1992).

A lack of agreement between self-reported and medical record data could occur for several reasons. Although medical records may provide more accurate accounts of events on average, there are potential reasons for inaccuracies in the medical record as well, such as coding errors or missing data. Women may misreport events because they forget what occurred, did not understand what was happening at the time, or there were communication problems, such as inadequate explanation of procedures on the part of providers (Elkadry et al., 2003; Gartland et al., 2012). In some cases, the lack of agreement between the sources could be due to differing definitions or understanding of the event of interest rather than actual inaccuracy in either source (Gartland et al., 2012).

The aims of this study were to examine whether 1) women's self-reported reasons for cesarean delivery were consistent with diagnostic codes in hospital discharge data, and 2) the chances of self-report being substantiated by the discharge data varied by specific indication for cesarean or sociodemographic factors.

Methods

Data and Sample

Data are from the First Baby Study, a cohort of women who gave birth to their first baby in 76 Pennsylvania hospitals between 2009 and 2011 ($N = 3{,}006$; Kjerulff et al., 2013). Women were enrolled in the study during their third trimester of pregnancy, and followed for 36 months after delivery. Records were linked to hospital discharge data and birth certificates. The sample for the present study is limited to women for whom the hospital discharge data were available and who delivered by cesarean ($n = 856$). The self-reported measures in the present study are drawn from the baseline and 1-month postpartum interviews. The First Baby Study was approved by the Penn State College of Medicine Institutional Review Board as well as the institutional review boards of the hospitals and other institutions throughout the state that were involved with participant recruitment. This work is a secondary analysis of deidentified First Baby Study data and was therefore granted exemption from review by the University of Minnesota Institutional Review Board.

We excluded 8 women because either their self-reported responses or discharge records precluded assessment of concordance: two women responded that they did not know the reason for their cesarean, one woman responded that her cesarean was due to maternal request, and four additional women self-reported a reason for their cesarean for which there was no potential analog in the medical record (e.g., "Too difficult for mother"). For one woman, the only diagnostic code in the discharge data was 669.7 (cesarean delivery, without mention of indication). Two additional women had missing values on some of the covariates included in the logistic regression, and were therefore excluded, leaving a final analytic sample of 846.

Measurement

Discharge records

Cesarean deliveries were identified in the discharge data through *International Classification of Disease, 9th edition* (ICD-9) procedure code 740. We created categories of indications for cesarean in ICD-9 based on prior literature (Gregory, Korst, Gornbein, & Platt, 2002; Henry, Gregory, Hobel, & Platt, 1995; Kahn, 2009). This process resulted in 17 initial categories: failed induction, failed vacuum/forceps, dystocia, malpresentation, macrosomia, cephalopelvic disproportion, antepartum bleeding or placental conditions, abnormalities of organs/soft tissues of pelvis, fetal distress or abnormality of fetal heart rate, hypertensive disorders, diabetes, other health problems of mother, postterm pregnancy, umbilical cord complications, fetal abnormalities/conditions, hydramnios/oligohydramnios, premature or prolonged rupture of membranes, or infection of the