Surgical speed and risk for maternal operative morbidity in emergent repeat cesarean delivery

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OBJECTIVE: The purpose of this study was to determine whether surgical speed is associated with maternal outcomes in women who have a history of previous cesarean delivery (CD) and who require emergent delivery.

STUDY DESIGN: This is a secondary analysis of a multicenter, prospective observational study of women with a history of previous CD. Women who attempted a vaginal birth after CD and required emergent CD were dichotomized into those with a skin incision-to-fetal delivery time of ≤2 min (I-D ≤2) or >2 min (I-D >2), based on the mode I-D. Rates of composite maternal complications and specific surgical complications were compared.

RESULTS: Seven hundred ninety-three women had an emergency repeat CD: 108 women (13.6%) had I-D ≤2, and 685 women (86.4%) had I-D >2. The composite of maternal morbidity occurred in 36% of women with I-D≤2 and 23% with I-D>2 ($P < .01$). Women with I-D ≤2 had higher odds of intraoperative transfusion, uterine artery ligation, and broad ligament hematoma. In a multivariable regression model, the only variable that remained associated with maternal outcome was I-D (relative risk, 1.66; 95% confidence interval, 1.23—2.23). There was no difference in the incidence of neonatal acidemia between groups.

CONCLUSION: Among women who underwent emergent repeat cesarean delivery, surgical speed was associated with an increased risk for maternal complications.

Key words: cesarean delivery, complication, emergent cesarean delivery, maternal morbidity, trial of labor after cesarean delivery

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For cesarean deliveries (CDs) that are deemed emergent, a common practice is to perform a "stat" CD within 30 minutes of the decision to operate. The American College of Obstetricians and Gynecologists (ACOG) previously recommended that all hospitals that provide obstetric services have the capability to begin surgery within 30 minutes of the decision to perform a CD.[1] However, because studies have failed to show improved neonatal outcomes when CD is performed within this timeframe, less emphasis has been placed on operating within a specific window of time.[2-7] The current ACOG recommendations for management of a category III heart tracing, for example, state that the optimal timeframe for delivery has not been determined but that delivery should be accomplished "as expeditiously as possible."[8]

What is not known is how maternal outcomes are affected by emergent CDs. The interval from decision-to-delivery reflects the operation of systems-based practice (mobilization of clinical care teams, operating room set up, patient transport, and preoperative surgical preparation) and surgical speed. Although expeditious coordination of surgical care may be expected to increase the risk for adverse outcomes, there is a paucity of research regarding the impact of surgical speed on the risk of maternal operative complications.

Our objective was to determine whether surgical speed is associated with adverse maternal outcomes in women who have a history of CD and require emergent delivery. We hypothesized that shorter incision-to-delivery (I-D) times would be associated with increased risk for the composite outcome of maternal morbidity.

Materials and Methods

This is a secondary analysis of the CD registry, which has been created by the institutions that comprised the National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network between 1999 and 2002.[9] Data were collected prospectively for women with a history of CD who underwent repeat CD at 1 of the 19 participating centers. Detailed information regarding medical, surgical, and obstetric histories, intrapartum and postpartum

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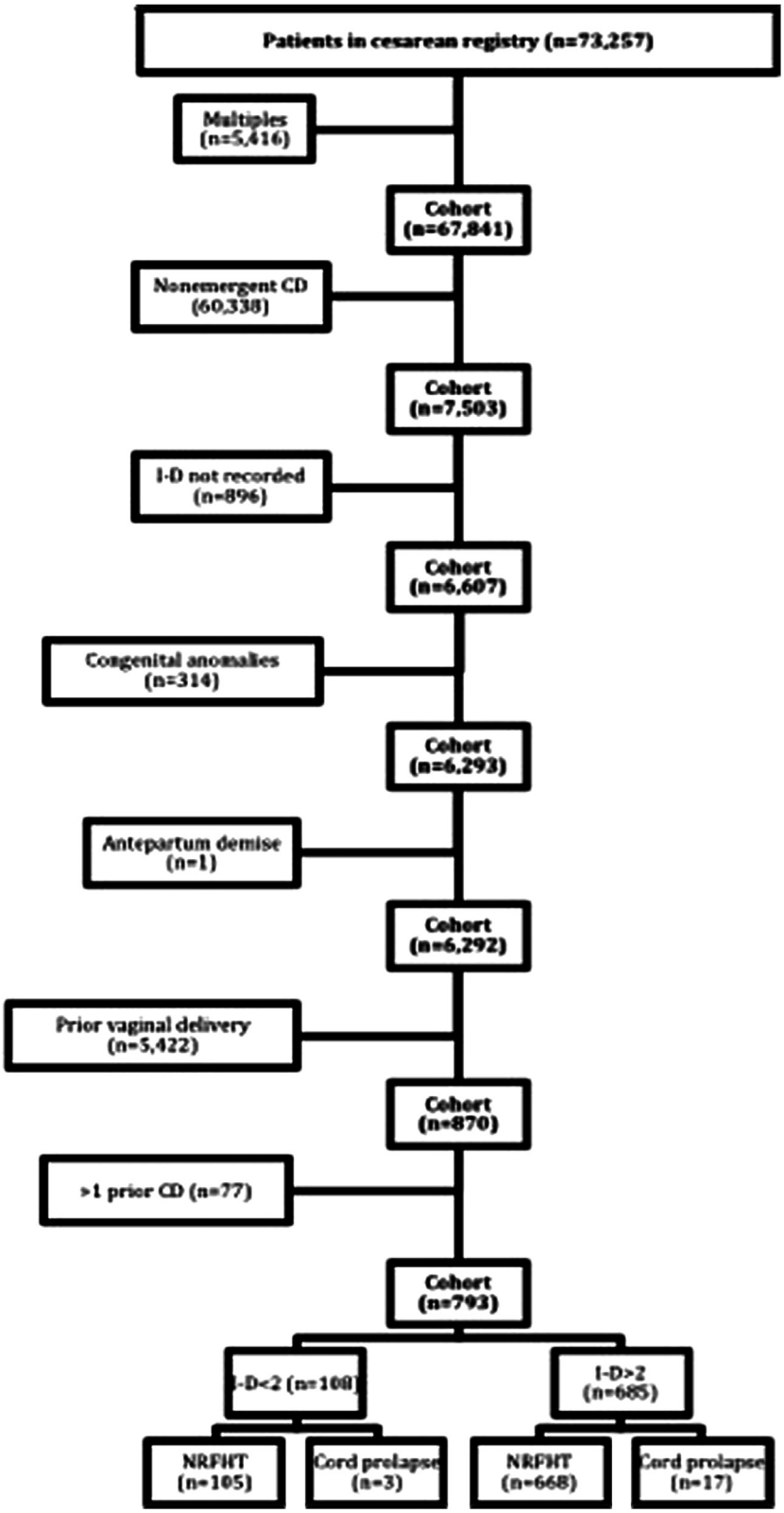
FIGURE 1
Flow diagram of study cohort selection



CD, cesarean delivery; *I-D*, incision-to-delivery; *I-D<2*, incision-to-delivery ≤2 minutes; *I-D>2*, incision-to-delivery >2 minutes; *NRFHT*, nonreassuring fetal heart tracing.

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