Vaginal Birth After Cesarean Section: A Cohort Study Investigating Factors Associated With its Uptake and Success

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Topics: Systems-based Practice, Obstetric Complications

After women have undergone a cesarean section (CS) for their first delivery, they have to decide for their next pregnancy whether to have an elective repeat CS (ERCS) or attempt a vaginal birth after cesarean section (VBAC). Most women with an uncomplicated first CS and an uncomplicated subsequent pregnancy can attempt a VBAC. However, rates of VBAC have decreased in several countries, and this trend, along with rising rates of primary CS, has caused widespread public and professional concern. This cohort study was performed to investigate the demographic and obstetric factors associated with attempted and successful VBAC in women having their second child. Maternal and clinical characteristics associated with the decision to attempt a VBAC and the probability of success were assessed and included factors from the first and second pregnancies.

Using data from the English National Health Service (NHS), patient demographics, clinical information, and administrative data were collected from women aged 15 to 45 years whose first birth resulted in a live, singleton delivery by CS between April 2004 and March 2011 and who had a second birth by March 31, 2012. From 571,633 live, singleton deliveries by CS among primiparous women, 207,748 had second births within the designated study period. Exclusions based on the second birth included 10,799 for preterm delivery and 13,409 for obstetric indications for ERCS (multiple pregnancy, noncepahalic presentation, or placenta previa/abruption). From 143,970 remaining eligible deliveries, 75,086 (52.2%) attempted VBAC and 68,884 underwent ERCS.

After adjustment for other factors, younger women, those of nonwhite ethnicity, and those who lived in an economically deprived area had higher rates of attempted VBAC. VBAC rates were also higher in women whose first baby had a lower birth weight and those who had their second child <3 year after the first. The presence of a clinical risk factor, including preexisting diabetes, gestational diabetes, or hypertension reduced the likelihood that VBAC would be attempted. The rate of attempted VBAC did not change significantly over the study period. Of the 75,086 women who tried a VBAC, 47,602 (63.4%) successfully achieved a vaginal delivery. Younger women and those of white ethnicity had a higher success rate. Clinical risk factors (gestational diabetes, premature rupture of membranes, and higher birth weights) decreased the success rate for VBAC. A slight increase in the rate of successful VBAC was noted over the study period ($P$ = 0.002) which could not be explained by differences in risk factors. Women who had an emergency CS for the first birth were more likely to attempt a VBAC, but they had a lower success rate than women who had a prior elective CS. Among women whose first birth was by emergency CS, those with a history of failed labor induction were the least likely to attempt and to succeed with a VBAC ($P < 0.001$). In those with a first birth by elective CS, those with an indication other than nonepahalic presentation or placenta previa were least likely to attempt and have a successful VBAC ($P < 0.001$). There was significant variation among the 140 NHS trusts. The interquartile range (IQR) for the adjusted rate of attempted VBAC was 47.1% to 58.6% but with a nearly 3-fold variation across trusts; the IQR of the adjusted rate of successful VBAC was 60.4% to 65.9% with an almost 2-fold variation among trusts.

In conclusion, within the English NHS approximately 50% of women with a primary CS who were eligible for a trial of labor attempted a VBAC for their second birth and almost 66% of these women had a successful vaginal delivery. Results from this study related to those characteristics associated with attempted and successful VBAC could be used to improve selection of women for VBAC.

Marfan Syndrome and Pregnancy: Maternal and Neonatal Outcomes

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Topics: Nonobstetric Maternal Disease, Maternal Morbidity and Mortality, Neonatal Morbidity and Mortality

In women with Marfan syndrome (MFS), 80% will have some cardiovascular abnormalities, which can have an impact if they become pregnant. In a normal pregnancy, the aorta dilates and aortic compliance is increased. This along with a reduction in mucopolysaccharides in the aortic wall may contribute to the increased risk of aortic dissection in parturients with MFS. Patients with MFS may also be predisposed to left ventricular (LV) dilatation and impairment of LV function. MFS carries an increased risk of obstetric complications, including preterm delivery, preterm prelabour rupture of membranes, cervical
incompetence, poor fetal outcome, and postpartum hemorrhage (PPH). This retrospective case-control review was performed to evaluate maternal and neonatal outcomes in women with MFS.

Women with MFS were matched with 4 controls, 2 who delivered immediately before and 2 who delivered immediately after each index case. Data were collected from a detailed review of case notes, including maternal demographic characteristics, obstetric and anesthetic management during pregnancy and labor, and maternal and neonatal outcomes, particularly cardiac, obstetric, and fetal/neonatal complications. The Student t, Mann-Whitney U, \( \chi^2 \), or Fisher exact tests were used, as appropriate. All tests were 2-tailed and \( P < 0.05 \) indicated statistical significance.

Data from 29 pregnancies in 21 women with MFS were compared with data from 116 controls. The groups did not differ significantly in age or parity. Maternal and fetal/neonatal outcomes in the 21 nulliparous and 8 parous women with MFS were similar. Two women with MFS had prior valve-sparing aortic root replacement and 1 had both the aortic root and valve replaced. Data from echocardiography from 11 pregnancies showed a mean increase in aortic root diameter of 0.47 mm although this was not found to be a significant change. Significant changes in LV dimensions and function also did not occur during pregnancy. No patient died but 5 pregnancies (17%) were associated with significant cardiac complications. Three required cardiac surgery I had a type A aortic dissection 10 days after delivery resulting in emergency aortic root and valve replacement, and 2 had cardiac surgery within 6 months of delivery—aortic valve replacement on postpartum day 7 due to increasing aortic root dilatation and aortic root and valve replacement at 6-month postpartum due to worsening aortic regurgitation. In addition, 2 patients developed decreased LV function during pregnancy.

Vaginal delivery occurred in 17 (59%) of the index pregnancies compared with 86 (74%) of controls; 12 women with MFS (71%) required either forceps or vacuum assistance compared with 15 (17%) of controls. Of note, recommended management of parturients with MFS included assisted vaginal delivery unless the woman had a very short second stage of labor. Cesarean section rates were 41% (12/29) in the MFS group and 26% (30/115) in the controls although this was not statistically significant (\( P = 0.11 \)). Nine CSs in the MFS group were for obstetric reasons, whereas 3 were performed electively for progressive aortic root dilatation or deteriorating LV function.

The risk of obstetric complications was significantly higher in MFS patients [odds ratio (OR), 3.29; 95% confidence interval (CI), 1.30-8.34] and occurred in 10 (34%) pregnancies. One patient had pregnancy-induced hypertension, another had antepartum hemorrhage, and 8 had PPH. Sixteen controls (14%) had complications, with 1 developing pregnancy-induced hypertension, 5 having pre-eclampsia, and 4 having spontaneous preterm labor. Women with MFS were more at risk for PPH (OR, 8.46; 95% CI, 2.52-28.38). No fetal or neonatal deaths occurred but complications were more likely in the infants of MFS mothers (OR, 3.8; 95% CI, 1.45-10.47). The median ages at delivery in the MFS group and controls were 39 weeks (range, 35 to 42 wk) and 40 weeks (range, 27 to 42 wk), respectively (\( P = 0.04 \)). Preterm delivery rates were 7% and 4% for the MFS and control women, respectively. Mean birth weights in the MFS and control groups were 3068 and 3324 g, respectively. Babies in the MFS group were more likely to be small for gestational age (24% vs. 6%; OR, 4.29; 95% CI, 1.58-15.55). Six babies in the MFS group were diagnosed with MFS after genetic testing, 10 were unaffected, and in 13 the diagnosis was not proven or refuted. No other congenital abnormalities were detected.

These results indicate that women with MFS have significant rates of maternal, fetal, and neonatal complications. Careful surveillance of the mother and fetus, thorough prepregnancy counseling, especially regarding the risk of aortic dissection, and early intervention in the event of dissection or rapid dilatation of the aortic root are required to ensure that complications are minimized and these women have favorable pregnancy outcomes.