Association of first Birth Cesarean Delivery and Placental Abruption or Previa at Second Birth

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Abstract

Objective: To evaluate the strength of association of cesarean delivery for first birth with placenta previa and placental abruption in second pregnancy.

Design: Retrospective cohort study.

Setting: Hospital based (Birth register) 2004-2008. A total of 1638 pregnancies were available for the final analysis after excluding missing information.

Methods: Multiple logistic regressions were used to describe the relationship between cesarean section for first birth with placenta previa and placental abruption in second birth singletons.

Main outcome measures: Placenta previa and placental abruption

Results: Placenta previa was present in 10 per 1000 second-birth singletons whose first births delivered by cesarean section and 9 per 1000 second-birth singletons whose first births delivered vaginally. The corresponding figures for placental abruption were 5 per 1000 in the previous cesarean delivery group and 5 per 1000 in the previous vaginal delivery group. The adjusted odds ratio (95% confidence intervals) of previous cesarean section for placenta previa in following second pregnancies was 1.10 (0.39 to 3.10) after adjusting for confounders including maternal age and interval between births. The corresponding figure for placental abruption was 1.0 (0.24 to 4.19).

Conclusion: Cesarean section for first birth is associated with 10% increased risk of placenta previa and no risk of placental abruption in second pregnancy with a singleton.

Keywords: Placenta previa, placental abruption, previous cesarean section.

INTRODUCTION

Cesarean delivery has increased steadily, with one in four delivery occurring by cesarean section. It has been associated with increased risk of placental abruption and previa in subsequent births, conditions resulting in increased likelihood of low birth weight, preterm delivery and perinatal death.1-8

A meta-analysis reported that women with at least one prior cesarean delivery had a 2.6 fold increased risk of placenta previa in subsequent pregnancy.2 The studies have reported that the risk of placental abruption increased by 30% in second pregnancies in women who had first born cesarean delivery.9,10 The association between previous cesarean birth and placenta previa or placental abruption in subsequent pregnancy is inconsistent and is not confirmed in two studies.11,12

MATERIALS AND METHODS

We conducted a retrospective study using data from KLES Shree Prabhakar kore hospital birth register, Belgaum (2004-2008). This hospital is a tertiary care center with approximately 2500 to 3000 deliveries annually.

The study cohort included all second gravidas who delivered in our hospital from January 1, 2004 through June 31, 2008. The register gave information on maternal age, marital status, obstetric history, complications associated with pregnancy, labor and delivery. Women with previous history of abortions, placenta previa, placental abruption and present pregnancies with multiple pregnancy or medical complications (such as cardiac disease, diabetes, chronic hypertension, renal disease, pregnancy induced hypertension, eclampsia) were excluded from the study.

After the exclusions were made, 1810 subjects remained for analysis. Subjects were classified into previous vaginal delivery and previous cesarean delivery groups according to the method of delivery for the first birth. Placental abruption was defined as premature separation of normally situated placenta from uterus while placenta previa was defined as implantation of the placenta over or near the internal os of the cervix.

We compared the important characteristics of the two groups. Adjusted odds ratios(ORs) for previous cesarean delivery associated with placenta previa and placental abruption were estimated using multiple logistic regression. Potential
confounding variables included maternal age (< 20, 20-24, 25-29, 30-34, 35-39, > 40) and interval between the births (< 1, 1-2, 2-3, 3-4, > 4). All analysis were performed using SPSS software version 10.

RESULTS

A total of 1810 second born singletons were included initially. We excluded 35 women with missing information on maternal age, 95 women with missing information on interval between births and 42 women with missing information on previous mode of delivery. After these exclusions, 1638 pregnancies were available for the final analysis.

Both the previous vaginal and previous cesarean delivery groups had similar age and birth interval distribution (Tables 1 and 2).

About 10 per 1000 second-birth singleton pregnancies were complicated with placenta previa among first births delivered by cesarean section, while 9 per 1000 second-birth singleton pregnancies were complicated with placenta previa among first births delivered vaginally (Table 3). The corresponding figures for placental abruption were 5 per 1000 in the previous cesarean delivery group and 5 per 1000 in the previous vaginal delivery group (Table 4). The crude OR (95% confidence intervals) of previous cesarean section for placenta previa in following second pregnancies was 1.11 (0.39-3.12), however, the OR remained same after adjusting for confounders, including maternal age and interval between births. The corresponding crude and adjusted OR (95%CI) for placental abruption were 0.99 (0.24-4.18) and 1.0(0.24-4.19) (Table 5).

DISCUSSION

Several studies done to determine the risks of placenta previa and placental abruption have showed potential risk factors as maternal age, race, marital status, parity, prenatal care, cocaine use and smoking during pregnancy.1,2,11-19 AS the cesarean deliveries are increasing, the incidence of placenta previa and placental abruption is expected to rise. The association between the number of previous cesarean section and subsequent placenta previa and placental abruption is not consistent.4,20,21 Our study includes second singleton births as it represents a homogenous population which eliminates potential confounding effects of parity and multiple gestation.

Our study showed that women with one cesarean delivery have 10% increase in risk of placenta previa in subsequent pregnancy than are those without such a history. However, the magnitude of the risk was lower compared to Washington State Birth Events Record Data based study9 and 1989 to 1997 Missouri longitudinally linked data based study.10 There are few previous studies that have examined the association between previous cesarean delivery and placental abruption. Our study did not show increased risk of placental abruption unlike increased shown by Norwegian birth registry–linked cohort study,8 a Swiss birth registry study,22 Washington State Birth Events Record Data based study9 and 1989 to 1997 Missouri longitudinally linked data based study.10

An association between lower segment uterine scar with placenta previa and placental abruption is plausible as the uterine scar impairs placental blood supply in anterior placenta.8 Uterine scar leads to pathological changes in the myometrium

<table>
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<th>Vaginal delivery</th>
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<th>Cesarean delivery</th>
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and endometrium of the uterus which includes polyp formation, lymphocyte infiltration, capillary dilatation and infiltration of the endometrial tissue that surround the scar by free red blood cells. They changes cause increased vascular malformations and increased fragility of vessels. Uterine artery ligation during cesarean section may further increase the risk. According to Hershkowitz et al uterine incision interfered with its physiological stretching and prevented placental migration to the upper uterine segment.

The strengths of our study was that analysis was confined to women with second singleton births, eliminating potential confounding effects of parity and multiple gestation. We excluded women with previous placental abruption or previa, which could have predisposed them to cesarean delivery and recurrence of uteroplacental bleeding. Also placental abruption might be attributable to high-risk medical or pregnancy conditions rather than method of delivery, so we included only women without medical or pregnancy complications.

Our retrospective study has some limitations, since it is a hospital based study, its results are not applicable on the whole population of Indian pregnant women. Hence more prospective and population based studies should be initiated to avoid under-reporting.

CONCLUSION

Cesarean section for first birth is associated with 10% increased risk of placenta previa and no risk of placental abruption in second pregnancy with a singleton.

REFERENCES