

THE RISK OF PLACENTA ACCRETA FOLLOWING PRIMARY ELECTIVE CAESAREAN DELIVERY

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Abstract: *The retrospective study was conducted in Gynecology Department, Nishtar Medical Hospital, to assess the risk of placenta accrete after the primary (first) emergency or elective c-section. The study was conducted on data from women with placenta accreta who underwent primary C-sections from 2017 to 2020. Analysis was done through variably matched sets. Data on cases and controls was extracted from hospital records. There were 70 women in the study group and 115 in the control group. Results showed that of 70 cases, 40 (57.1%) had placenta accreta, 16(22.8%) had placenta increta, and 14 (20%) had placenta percreta. A significantly higher number of cases than controls had primary elective c section (P<.001). The elective C-section had a significantly higher risk of subsequent placenta accreta than the emergency C-section (P=0.025). Thus, it was concluded that the primary elective C-section modifies the risk of subsequent placenta accreta.*

Keywords: Placenta accreta, Elective caesarean section, Placenta praevia, Emergency caesarean section.

Introduction

Though not common, some recent studies have shown a dramatic increase in the cases of abnormal placentation, including placenta accrete and placenta praevia. (Akhade et al., 2020; Jauniaux et al., 2020) Placenta praevia, an aberrance in which the placenta is located proximally or over the cervix, is the most common. Placenta accrete is when the placenta has abnormally adhered to the myometrial surface. Placenta increta and placenta procreate, which infiltrate the myometrium, are more serious abnormalities (Jauniaux and Silver, 2020). Such placental aberrations are associated with a high risk of hemorrhage, threatening maternal life during delivery. Moreover, it increases morbidity due to the need for prolonged hospitalization, blood transfusion, peripartum hysterectomy, and damage to surrounding organs. Its etiology is unclear; however, studies have shown that older age, previous caesarean section and placenta praevia in current pregnancy is associated with increased risk of placenta accrete (Jauniaux et al., 2022). Two or more previous cesarean deliveries magnify this risk by eight times (Wender et al., 2022). Recently, the rate of caesarean sections (C-sections) has increased. According to recent data, the rate of C-sections in Pakistan is 19.5%, making Pakistan a developing state majorly responsible for the global rise in C-sections (Mahmood and Sultan, 2006). Moreover, there has been an increase in the primary

elective C-section rate without any clinical justification (Amjad et al., 2020). Though it is widely known that these risk factors increase the incidence of placenta accrete, literature is scarce on how a previous C-section may cause abnormal placentation. Particularly, the impact of primary elective c section (c section performed without established labour), in which thick myometrium is incised without the presence of labour, and emergency C-section (c section in which thin uterine wall is incised and labour is present) on incidence of placenta accrete is not known. Thus, this study is conducted to assess the risk of placenta accrete after primary (first) emergency or elective C-section.

Methodology

The retrospective study was conducted in the Gynecology Department of Nishtar Medical Hospital. The study was conducted on data from women with placenta accreta who underwent primary c-sections from 2017 to 2020. The ethical board of the hospital approved the conduct of the study. The data were analyzed to examine the impact of primary C-section on the incidence of placenta accreta in a present pregnancy with placenta praevia. Analysis was done through variably matched sets. The Subset of patients with a history of C-section, placenta accreta, and co-existing placenta praevia was included. Women who

have placenta accreta without prior C-section and nulliparous women were excluded. The obstetric specialist examined the medical record of all controls and cases to confirm the diagnosis and abstract neonatal, peripartum, and obstetric data. Data from the controls were also extracted from the hospital's medical records. Eligibility criteria for the controls were history of one or more C-sections, delivery during the study period, and placenta praevia. A number of prior C-sections, maternal age and placenta praevia matched controls and cases. Two controls were matched with each case where possible.

Data were analyzed using SPSS version 23.0. Continuous data were represented as mean, standard deviation, and categorical data as frequency and percentage. Outcomes in controls and cases were compared using Fisher's exact tests and Mann-Whitney U-tests for categorical and continuous data, respectively. Conditional logistic regression is used to examine the impact of primary C-section on the incidence of accreta. The impact was summarized using 95% CIs and odd ratio. P value < 0.05 was considered statistically significant.

Results

During the study, there were 82 live births, of which 80 women had placenta accreta. 10 women without a history of a prior C-section were excluded. Of 70 eligible cases, 25 were compared with one control and 45 with two controls. Thus, there were 70 women in the study group and 115 in the control group. 39% of controls and 60% of study cases gave birth before the

37th gestational week. Of 70 cases, 40 (57.1%) had placenta accreta, 16(22.8%) had placenta increta, and 14 (20%) had placenta percreta. 75% of cases required a hysterectomy at delivery, compared to 2% of controls (P<.001). In all cases of hysterectomy, placenta accreta was histologically confirmed. The placenta location was anterior, posterior, and anterior-posterior in 87.9%, 9.6%, and 2.5% of cases, respectively. There was no difference between controls and cases regarding maternal age, parity, or gravidity (Table I). A significantly higher number of cases than controls had primary elective c-sections (P<0.001). Neither group differed regarding previous uterine surgery, vaginal delivery, and pregnancy loss. Among women who had primary emergency C-section difference between both groups regarding the length of labour or cervical dilation was not statistically significant. Moreover, the Gestational age of cases and controls with primary C-sections without labour did not differ significantly.

According to univariate analysis, placenta accreta was significantly associated with the indication for primary C-section. There was no association between the development of placenta accreta and women's parity, gravidity, previous uterine surgery, and vaginal delivery. The elective C-section had a significantly higher risk of subsequent placenta accreta than the emergency C-section (P=0.025). Incidence of placenta accreta was not significantly associated with gravidity (P=0.063), parity (P=0.589), prior uterine surgery (P=0.866), and prior vaginal delivery (P=.365) in pregnancies complicated by placenta praevia (Table II).

Table I Comparison of maternal characteristics between cases and controls

Maternal Characters	Study cases n=70	Controls n=115	P value
Maternal age (years)	31(19-41)	32(20-42)	0.451
Gestational age < 37 weeks	42(60%)	45 (39%)	0.001
Gravidity			
2	7 (10%)	17 (14.7%)	0.058
3	16 (23%)	20 (17.3%)	
4⁺	46 (65.7%)	77 (67%)	
Parity			
1	19 (27.1%)	33 (28.6%)	0.344
2	20 (28.5%)	22 (19.1%)	
3⁺	30 (42.8%)	58(50.4%)	
No. of prior C-section			
1	32 (45.7%)	61(53%)	0.591
2	20(28.5%)	32 (27.8%)	
3⁺	17(24.2%)	24 (20.8%)	
Type of first C-section			
Elective	32 (45.7%)	21 (18.2%)	<0.001
Emergency	37 (52.8%)	93(80.8%)	
Previous miscarriage			0.416

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Vaginal delivery before C-section	18 (25.7%)	39 (33.9%)	0.725
Vaginal delivery after C-section	23 (32.8%)	43 (37.3%)	0.741

Table II Results of logistic regression analysis

Variable	Odd ratio (95% CI)	P value
Vaginal delivery before primary C-section	.85(.60-1.22)	0.365
Gravity	.79(.61-1.03)	0.063
Parity	1.13 (.75-1.17)	0.589
Prior uterine surgery	1.07 (.53-2.16)	0.866
Elective vs. emergency C-section	3.0(1.46-6.13)	0.025

Discussion

The increasing rate of C-sections has led to a rise in the incidence of placenta accreta, particularly in pregnancies complicated by placenta praevia. The current studies reported that the primary elective C-section increases the risk of placenta accreta. Women with elective c-sections are at three time's higher risk of subsequent placenta accreta than those with primary emergency C-sections. Moreover, this modified risk is not associated with parity, gravity, and vaginal delivery before or after the first C-section. Studies have shown an increasing rate of C-sections, which increases the risk of maternal morbidity and mortality in the next pregnancy (Booker and Moroz, 2019; Nahum-Yerushalmy et al., 2022). The placental abnormality was associated with a high hysterectomy rate and massive hemorrhage. Our study reported a high frequency of placenta accreta, in contrast to the previous study (Hou et al., 2021). In this study, women had a history of previous C-sections and co-existing placenta praevia.

Results showed that these factors were associated with an increased risk of placenta accreta, as reported by previous studies (Flores-Mendoza et al., 2022; Vyas et al., 2019). The major finding of this study is that the primary elective C-section substantially increases the risk of placenta accreta. In primary elective c section thick uterus is incised, which increases the risk of the subsequent placenta. The prelabour uterus is quiescent in contract to active uterine during labor, which causes high amplitude, high-frequency contractions. Myometrium facilitates parturition by becoming highly excitable and responsive to uterotonic agents (Parris et al., 2021). Moreover, hydroxyproline in the cervix is decreased, and collagen fibers become less cohesive and compact after vaginal delivery (Shynlova et al., 2021; Shynlova et al., 2020). Lack of uterine activation may lead to subsequent aberrant placentation. Two uteri responded differently to C-section scar and had variable placental implantation due to differences in hypoxic stress and inflammatory mediators. Surgical

insult caused by C-section significantly alters the growth of decidua basalis and its ability to contain infiltrative trophoblast. A study on transabdominal uterine thickness in near-term women showed that elective C-section leads to thinning of the lower uterine segment in a subsequent pregnancy (Heena and Kumari, 2020). Though in this study, we did not measure the thickness of the endometrial layer, it reasonably assumed that decidua over C-section scar is less developed. It is in line with the previous study's finding that decidua was absent at placenta accreta. These findings correlate with our results that previous elective C-section increase the incidence of placenta accreta in subsequent pregnancy, potentially due to less development of decidua. The limitation of our study is that it's a single center research, a larger study is recommended for detailed analysis.

Conclusion

The primary elective C-section modifies the risk of subsequent placenta accreta. Clinicians must consider this risk and counsel women in whom C-sections is performed. Furthermore, it should be avoided when there is the possibility of vaginal delivery.

Conflict of interest

The authors declared absence of conflict of interest.

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