Placenta Previa associated factors; Retrospective study

Abstract

Background: Past caesarean deliveries are more often associated with larger major hemorrhage and placental adhesion abnormalities in subsequent pregnancies with placenta previa than prior vaginal births. The purpose of this retrospective study from a single Saudi Arabian center was to assess the placenta previa risk factors.

Method: The presence or lack of preceding CS was used to categories placenta previa patients. Group 1 had received at least one CS and Group 2 had not received any CS. Using ultrasonography, placenta previa was diagnosed. The length of the procedure, the amount of blood lost during the procedure, and the necessary erythrocyte suspension (ES) quantities were compared between the groups.

Results:A total of 126 pregnant woman with placenta previa were included: 101 patients in Group 1 had at least one C section and 25 patients in Group 2 had no prior history of C sections. The meanpatient's age in Groups 1 and 2 was 34.5±6.1 and 33.1±6.5 years, respectively. The average duration of the surgery was 55.0±20.1 and 27.8±5.1 minutes, with a p-value of 0.001; the bleeding volumes were 489.2±350.5 ml and 230.2±120.8 ml, with a p-value of 0.001 for group 1 and 2 respectively.

Conclusion: We observed that there were substantial differences between the groups in terms of the duration of hospital stay, amount of bleeding, amount of erythrocyte suspension used, and duration of operation.

Keywords: placenta previa, C section, placenta accreta

Introduction

Placenta previa occur when the placenta completely encloses the internal cervical os. As the number of caesarean deliveries rises, the prevalence increase as well. When compared to previous vaginal births, previous caesarean births are more frequently linked to major haemorrhage and placental adhesion anomalies in subsequent pregnancies with placenta previa. Negative maternal (34%) and neonatal (60%) outcomes were linked to placenta previa. According to Kollmann et al, study there was no correlation between the placenta previa severity and variations in risk variables or maternal outcome (Ozdemirci et al., 2020; Kollmann et al., 2016). The two main risk factors are previous caesarean section (CS) and placenta previa (Jain et al., 2020; Jauniaux et al., 2019). However, other risk factors include maternal age, numerous pregnancies, smoking, chronic hypertension, multiple gestations, and prior uterine surgeries (curettage and myomectomy) (Jenabi et al., 2022). It's possible for labour to end in severe bleeding, especially in late pregnancy.

Women who have placenta previa or a low-lying placenta at high risk to experience unfavourable maternal, foetal, and postnatal outcomes. These consequences could include an inaccurate diagnosis, unneeded hospitalisation, activity restrictions, an early delivery, or a caesarean section. It may be possible to enhance maternal, foetal, and postnatal outcomes by the optimization of diagnosis and management methods (Jain et al., 2019). Obstetricians need to be aware of the higher risk of unfavourable pregnancy outcomes associated with antepartum hemorrhage in women with complete placenta previa, a short cervical sleeve, an anterior placenta, and a largely missing overlying myometrium.

Other complications of placenta previa include preterm birth, the requirement for a caesarean hysterectomy, and maternal death (Gurol et al., 2011; Long et al., 2021). Placental invasion is more common in patients who have had a previous caesarean surgery. Antepartum hemorrhage, postpartum hemorrhage, and hysterectomy are all more likely in these patients (Long et al., 2021). Diagnoses are aided by trans-vaginal or trans-abdominal ultrasound (Anderson et al., 2023). The placenta has completely closed the cervical os, according to diagnostic ultrasound.

Higher gravidity, higher parity, and a history of lower segment caesarean sections all raise the likelihood of placenta previa; older mothers and prior abortions had no discernible impact (Abu et al., 1999).In a study conducted by Cieminski et al., 2005,when compared to the primiparas, the

frequency of placenta previa was considerably greater in the group of women who had previously given birth, and it rose with the number of prior births. It was not established that prior abortions, caesarean sections, and placenta previa were related.The most severe forms of placenta previa and percreta initially seemed to be connected with higher odds of developing maternal obesity; however, this relationship disappeared when other risk factors, such as a history of caesarean birth, were taken into account. The rate of obesity that was observed and the rate that was calculated using the risk of caesarean birth due to obesity did not vary(Vieira et al., 2021).

Our aim was to investigate risk factors and variables related to placenta previa, we retrospectively analyzed individuals with the condition who had surgery performed by the same doctor.

Method

We conducted a retrospective analysis of placenta previa patients who underwent surgery under the same physician between January 2021 and January 2023. The King Saud Medical City ethical review board gave the project its IRB approval (H1R1-03-Dec23-03). Two groups were established. Patients having at least one prior caesarean section made up Group 1's patient population. Patients in Group 2 were those who had a typical birth and had never undergone a caesarean section. Data about patients was taken out of computerized health records. We noted the following: erythrocyte suspension volumes, invasion status, hematocrit and hemoglobin levels, length of surgery, body mass index, and placental location, gestational week at birth, gravidity and parity.

Placental invasion was the term used to describe situations in which the placenta was physically extracted from uterine myometrial tissue but could not be fully removed. This was associated with placental bed haemorrhage. The volume of blood in the aspirator represented the estimated blood loss.

The research included pregnant women whose placenta was entirely covered by the cervical os; however, those whose placenta was hidden or had surgery prior to week 20 were excluded. In addition, those with numerous pregnancies and those with comorbid illnesses including diabetes mellitus, hypertension, and bleeding issues were not included in the research.

For statistical analysis, SPSS ver. 24 was used. Data are shown as medians or as means and standard deviations. The groups were compared using either the Fisher exact or the Mann-Whitney U-test. Statistical significance was indicated by a P value less than 0.05. The normality of the data was assessed using the Kolmogorov-Smirnov test.

Results

A total of 126 individuals with placenta previa had surgeries: 101 patients in Group 1 had at least one C section in the past, and 25 patients in Group 2 had no history of C sections. Patients in Groups 1 and 2 had mean ages of 34.5±6.1 and 33.1±6.5 (Mean±SD) years, respectively, and there was no significant difference between them.

The mean of group 1gravidity was 5.2±2.2, whereas Group 2's gravity was 3.1±2.6, indicating a significant difference (P value 0.001) regarding parity the mean ±SD was 4.1±2.1 and 2.5±1.7respectively. In 69.2% of Group 1 and 45.1% of Group 2, the placenta had anterior previa; this difference was statistically significant (P=0.02). Group 1's mean BMI was 30.2; there was no discernible variation from group 1. Table 1 provides more demographic data.The average length of hospital stay for group 1 was 2.6±2.5 days, while for group 2 the average was 2.4±2.2.

The mean APGAR1 score was 5.4±1.7 and 5.4±1.8 respectively for group 1 and 2, while the mean of APGAR5 score was 8.2±1.7 for group 1 and 8.0±1.5 for group 2, no significant difference was detected between the two groups in APGAR1 and APGAR5 scores.

The average length of the surgery was 55.0±20.1 and 27.8±5.1 minutes, with a p-value of 0.001; the mean of preoperative hemoglobin in group 1 11.8±1.7(gram/dl)and 12.0±1.3(gram/dl) in group 2.There was no significant difference in the mean postoperative hemoglobin levels of 10.1 for group 1 and 10.6 for group 2. Preoperative hematocrit mean was 34.9±4.2 in group 1 and 35.5±3.8 in group 2, while postoperative hematocrit mean was 30.1±2.6 and 31.7±3.9 in group 1 and 2 respectively. 13.1% of patient s needed the blood intra-operatively in group 1, while no patient in group 2 needed intraoperative blood transfusion.

The bleeding volumes were 489.2±350.5 ml and 230.2±120.8 ml, with a p-value of 0.001; the volumes of the intraoperative administered erythrocyte suspension were 0.1±0.6 and 0 litre, respectively, with significant p-values of 0.04. Table 2 and Fig 1 displays the surgery data.

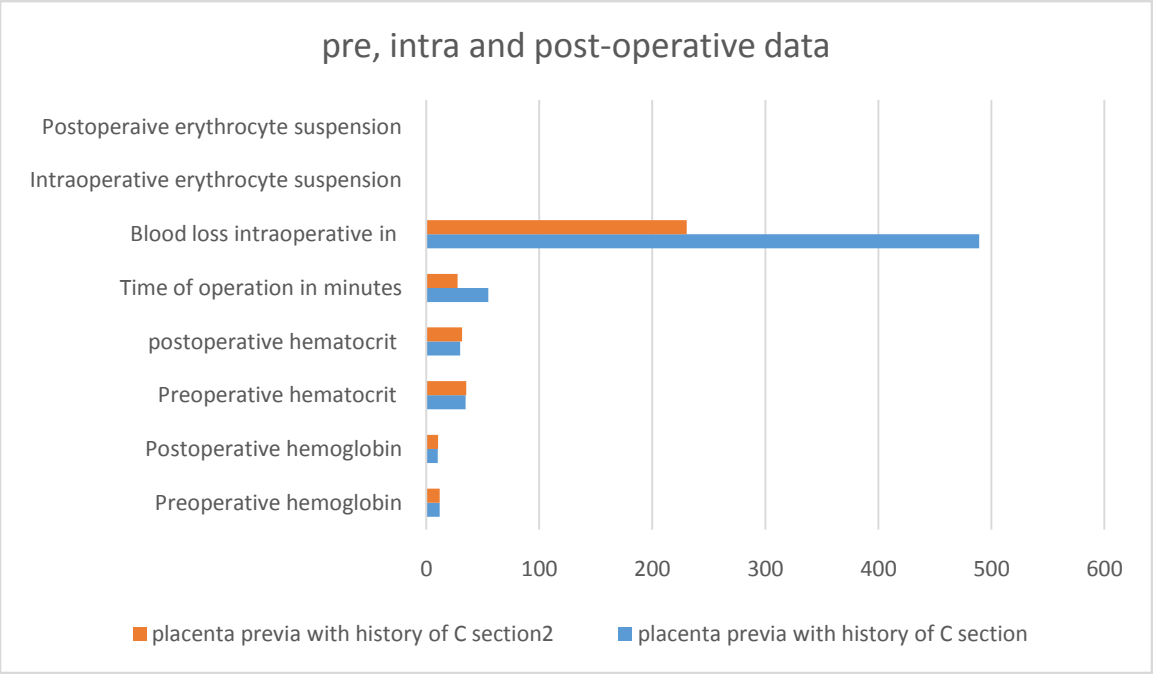
Table 1: Demographic characteristics of included participants

	placenta previa with history of C section Mean±SD (group 1)	**placenta previa with history of C section Mean±SD (group 2)**	p value
Age	34.5±6.1	33.1±6.5	0.415
Gravida	5.2±2.2	3.1±2.6	**0.001**
Parity	4.1±2.1	2.5±1.7	**0.001**
length of hospital stay	2.6±2.5	2.4±2.2	**0.028**
Totalis part			**0.02**
Anterior	69.2	45.1	
Posterior	30.8	54.9	
BMI	30.2±3.5	30±3.1	0.654
Apgar 1	5.4±1.7	5.4±1.8	0.245
Apgar 5	8.2±1.7	8.0±1.5	0.578

Table 2: pre, intra and post-operative data

	placenta previa with history of C section Mean±SD (group 1)	**placenta previa with history of C section Mean±SD (group 2)**	p value
invasion			0.001
yes	93.1	34.2	
no	6.9	65.8	
preoperative hemoglobin (gram/dl)	11.8±1.7	12.0±1.3	0.754
postoperative hemoglobin (gram/dl)	10.1±1.2	10.6±1.5	0.12
preoperative hematocrit (gram/dl)	34.9±4.2	35.5±3.8	0.645
postoperative hematocrit (gram/dl)	30.1±2.6	31.7±3.9	0.247
time of operation in minutes	55.0±20.1	27.8±5.1	0.001
blood loss intraoperative in (ml)	489.2±350.5	230.4±120.8	0.001
intraoperative erythrocyte suspension	0.1±0.6	0	0.04
postoperaive erythrocyte suspension	0.3±0.6	0.2±0.8	0.524
need of intraoperative blood			0.142
yes	13.1	0	0.01
no	86.9	100	
total blood need			
yes	25.2	12.1	0.21
no	74.8	87.9	

Fig 1 pre, intra and post-operative data



Discussion

In our study, there was a significant difference between the groups regarding the duration of the operation, the volumes of ES supplied intraoperatively, and the quantity of bleeding. Furthermore, Group 1's hospital stay was noticeably lengthier.

In Saudi Arabia, the prevalence rate of placenta previa was 4.1 per 1000 newborns, according to a 2014 research by Abduljabbar et al. additionally, they discovered that 56.5% of women had caesarean sections performed as emergencies, while 43.5% of women had them done as elective procedures.

A placenta previa is not just a medical condition. Maternal mortality as well as bleeding during pregnancy and birth can result from a placenta previa. In individuals with invasive anomalies in particular, an early delivery of the newborn can be necessary. In these individuals, the chance of a hysterectomy is also rather significant (Cresswell et al., 2013; Birendra etal., 2023). While ultrasonography can diagnose placenta previa, individuals receiving normal obstetric care may not necessarily show evidence of placental invasion (Bailit et al., 2015). Placental invasion has been linked in the literature to previous caesarean sections (Hobson et al., 2019), but no differentiation was established based on the patient's mode of delivery.

According to another study, women who have already undergone a caesarean section are particularly at higher risk of invasion (Jain et al., 2020). A highly significant difference in placental invasion was seen between the two groups in our study (93.1 and 34.2%, P value 0.001). Estimating placental invasion is aided by knowing about a previous CS.

An additional investigation on antepartum haemorrhage found that the group with high invasion experienced more bleeding (Long et al., 2021). There was no differentiation established in this research based on the method of prior delivery. Patients in the postpartum bleeding group had a greater number of caesarean sections performed. This group also had higher hospital days and placental invasion. Because placenta previa causes severe postpartum haemorrhage, it is known to increase the need for blood transfusions and maternal mortality (Ma et al., 2021).

It was discovered in this study that grouping patients based on whether or not they had had a caesarean section greatly enhanced the quantity of blood. When a patient has an abnormal (invasive) placenta, planned surgical delivery minimises risks and the need for blood

transfusions. The diagnosis of aberrant invasion was classified in the research based on whether it occurred during pregnancy or after childbirth, but there was no differentiation established between the groups based on the occurrence of caesarean sections (Tikkanen et al., 2011). In a UK research, bleeding was reduced when placental invasion was diagnosed during pregnancy. When quantifying haemorrhage, certain individuals who had never had CSs were disregarded (Fitzpatrick et al., 2012).

In a previous research, there was a maximum correlation found between massive transfusion and defective placentation (Mhyre et al., 2013). We discovered that Group 1 had much more placental invasion. During surgery, no Group 2 patients needed ES; however, 18 Group 1 patients did. Patients who had previously had CS had higher bleeding, and the amount of blood rose linearly with the number of prior CSs, according to a research comparing placenta previa patients who underwent normal delivery versus CS (Ozdemirci et al., 2020).

Conclusion

We observed that there were substantial differences between the groups in terms of the duration of hospital stay, amount of bleeding, amount of ES used, and duration of operation.

Conflict of interest

No conflict of interest in this study

Funding

None

Ethical approval

Research approved with IRB number (H1R1-03-Dec23-03)

Author'scontribution

Noura .R.Aldaham: supervised the research

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