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Association of Placenta Previa with Previously Scarred and Non-Scarred Uterus: A Descriptive Cross-Sectional Study

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ABSTRACT

Introduction: Placenta previa, where the placenta is partially or completely placed in the lower uterine segment, is a major contributor to vaginal bleeding during pregnancy and affects 0.4-0.5% of all labors. Its exact cause is uncertain but is believed to be linked to aberrant endometrial vascularization caused by scarring or atrophy from prior trauma, surgery, or infection.

Objective: The objective of this study was to establish an association between the placenta previa and the scarring of uterus.

Methods: A cross-sectional study was conducted on pregnant women at Nobel Medical College Teaching Hospital, Biratnagar, from November 2021 to October, 2023. Ethical approval and written consent were obtained from all participants. Using convenient sampling technique, the study involved 57 participants out of 3576 patients who were admitted for Lower Segment Cesarian Section.

Results: A study of 3576 patients admitted for Lower Segment Cesarian Section at Nobel Medical College Teaching Hospital, we found 57 cases of placenta previa over 24 months. The incidence was 1.59%, with 1.82% in patients with a previous history of LSCS and 1.51% without any history of scarring. The results showed no association between placenta previa and uterine scarring.

Conclusion: The study found no association between the incidence of placenta previa and scarred/non-scarred uterus, but a slightly higher likelihood of having placenta previa in those with a history of uterine scarring.

Keywords: Cesarean Section; endometrium; placenta; placenta previa.

INTRODUCTION

Placenta previa, where the placenta is partially or completely placed in the lower uterine segment, is a major contributor to vaginal bleeding during pregnancy, affecting 0.4-0.5% of all labors? Its exact cause is uncertain but is believed to be associated with endometrial vascularization.[1-3] Traditional classification of placenta previa, categorized into low-lying, marginal, partial, and total, is used for diagnosis through history, clinical examination, and tests like MRI and ultrasound.[4, 5]

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Placenta previa is a condition with unknown aetiology, involving factors like advanced maternal age, multiple pregnancies, multiple gestations, prior abortions, cesarean sections, dilatation curettage, myometrial injury, complete previa, and abortion history.[6-8] Most obstetricians worry about significant haemorrhage when the placenta is located anterior to the uterus, below the cesarean incision area, or when there is full previa.[9, 10]

Placenta previa patients face higher risks of peripartum hysterectomy, spontaneous miscarriage, and perinatal mortality. Preventive measures are needed to reduce these risks and improve infant outcomes.[11] Thus, the main purpose of this study was to establish an association between the placenta previa and the scarring of uterus.

METHODS

A descriptive cross-sectional study was carried out among the pregnant women visiting the Department of Obstetrics and Gynaecology, Nobel Medical College Teaching Hospital, Biratnagar. The study was conducted from November 2021 to October 2023.

Ethical approval was taken before beginning the study from the Institutional Review Committee Nobel Medical College (Ref. no. 440/2021). Written informed consent was obtained from all the participants involved in the study.

Cases of pregnancy between 37 to 40 weeks were only included in the study. Cases with other clinical conditions like diabetes, hypertension or previous history of placenta previa was not included in this study.

Sample size calculation was done using the formula,

$$n = z^2pq/d^2$$

where, z = 1.96 at 95% of CI

Mustafa SB et al from their study reported that the prevalence of placenta previa was 2.7%.[12]

Using the formula,

$n= Z^2 \times p \times q / e^2$

$= (1.96)^2 \times 2.7 \times (1 - 2.7)/ (0.05)^2$

$= 41$

where, n= required sample size; Z= 1.96 at 95% Confidence Interval (CI); p= prevalence of placenta previa, 2.7%; q= 1-p; e= margin of error, 5%

Thus, the minimum sample size of the study was determined to be 41 whereas during the period of 24 months a total of 57 cases were reported in our hospital which met all the criteria to be included in the present study. Hence, 57 participants were involved in the study following the convenient sampling technique.

A census sampling method was employed in this study, wherein data was collected from the entire patients those were admitted to the

department of Obstetrics and gynecology, Nobel Medical College Teaching Hospital, Biratnagar Nepal, rather than a subset, ensuring comprehensive coverage and accuracy in the findings. Only cases of pregnancy between 37 to 40 weeks were included in the study. Cases with other clinical conditions like diabetes and hypertension were excluded from the study.

The Statistical Package for social sciences (SPSS) 20.0 version was used to enter the data. Descriptive analysis was used in the computations to obtain the means, percentages, and numbers.

RESULTS

Over a period of twenty-four months, a total of 57 cases of placenta previa were diagnosed out of the 3,576 patients who were admitted for the Lower Segment Cesarean Section (LSCS) in the Department of Obstetrics and Gynecology at Nobel Medical College Teaching Hospital, located in Biratnagar, Nepal (table 1). These 57 cases were carefully included in this study, which aimed to explore the incidence and potential risk factors associated with placenta previa. The overall incidence of placenta previa in this population was determined to be 1.59%, highlighting the frequency of this condition within the studied population.

Among the total number of patients admitted, a subset of 936 individuals had a previous history of undergoing an LSCS. This group was of particular interest in the study due to the potential relationship between prior cesarean sections and the occurrence of placenta previa. Within this subgroup, the incidence of placenta previa was found to be 17 cases, corresponding to 1.82%. This finding suggests a slightly elevated risk of placenta previa among patients with a prior history of LSCS, though the overall incidence remains relatively low.

Conversely, the remaining 2,640 patients who were admitted to the Department of Obstetrics and Gynecology did not have any history of uterine scarring, whether due to previous cesarean sections or other procedures such as curettage. Among this group of patients with a non-scarred uterus, the incidence of placenta previa was found to be 40 cases, translating to 1.51%. This data point provides a useful comparison to the incidence observed in patients with a scarred uterus, offering insights into the potential impact of uterine scarring on the likelihood of developing placenta previa.

In the context of this study, it was observed that out of the total cases included, only 17 patients had a previous history of uterine scarring due to prior LSCS, while the remaining 40 subjects did not have any history of uterine scarring. This distribution of cases is presented in Table 1, which outlines the detailed characteristics of the study population.

Further analysis of the data revealed that out of all the cases of placenta previa, 13 subjects were below the age of 25 years, representing

22.8% of the total. Among these younger patients, 4 had a history of uterine scarring due to previous LSCS. Additionally, 36 patients were between the ages of 26 and 35 years, comprising 63.2% of the total cases, and within this age group, 11 individuals reported having undergone LSCS previously. The remaining 8 subjects were over the age of 35 years, accounting for 14% of the total cases, with 2 of these older patients having a history of uterine scarring due to LSCS. These age-related findings are further illustrated in Figure 1, which visually represents the age distribution of patients with placenta previa.

Among the total subjects included in the study, a detailed breakdown of the incidence of placenta previa according to pregnancy order was conducted. It was found that 18 cases occurred in patients during their first pregnancy, 17 cases in their second pregnancy, 12 cases in their third pregnancy, 5 cases in their fourth pregnancy, 4 cases in their sixth pregnancy, and 1 case in the seventh pregnancy. This detailed analysis provides insights into the relationship between pregnancy order and the likelihood of developing placenta previa.

The results of this comprehensive study did not establish any statistically significant association between the presence of placenta previa and the history of uterine scarring. The odds ratio was calculated to be 1.20, suggesting that the probability of having placenta previa is 1.20 times higher in women with a scarred uterus compared to those with a non-scarred uterus. However, this finding indicates only a modest increase in risk, and further research may be necessary to fully understand the relationship between these variables.

Table 1: Depicts the total number of cases of placenta previa in previously scarred and non-scarred uterus.

	Total cases	Placenta previa
Previously Scarred Uterus	936	17 (1.82%)
Previously Non-Scarred Uterus	2640	40 (1.51%)
Total	3576	57 (1.59%)

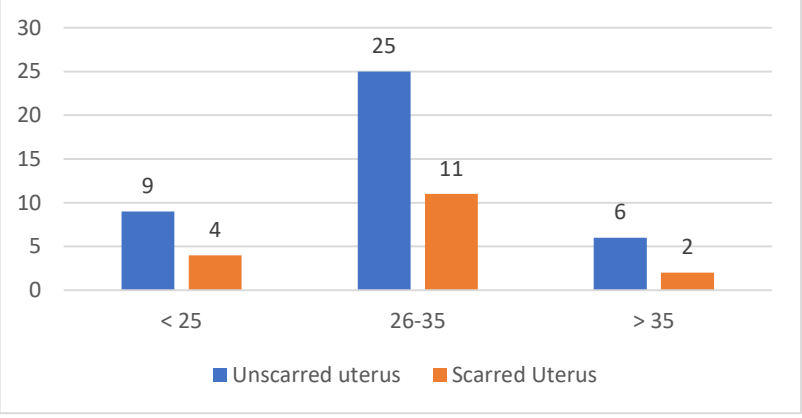

Figure 1: Depicting age groups of patients in scarred and unscarred category

DISCUSSION

An increased risk of maternal and neonatal mortality, fetal growth restriction and preterm delivery, antenatal and intrapartum hemorrhage, and the need for women to undergo blood transfusions or even an emergency hysterectomy are just a few of the severely detrimental effects that placenta previa can have on a mother and child. Other catastrophic outcomes include major blood transfusions, preterm birth, fetal development restriction, intrapartum hemorrhage, prenatal hemorrhage, and neonatal mortality, which can affect both the mother and the fetus.[13]

Placenta previa increases the risk of postpartum haemorrhage and cesarean hysterectomy in women because the lower uterine segment's reduced muscle content makes contractions less efficient in stopping bleeding.[11]

In this study the overall prevalence of placenta previa was found to be 1.59%. Similar studies

were carried out by various other researchers like To WW et al (0.83%), Parikh et al (0.82%), Katke RD (0.62%) and Mathuriya et al (0.6%) whose findings were quite comparable to the findings of the present study.[11, 14-16] In a study carried out by Mustafa et al, reported the overall incidence of placenta previa to be 2.70% which was slightly higher than the findings of the present study; also in a similar study carried out by Kollmann M, reported the incidence of placenta previa to be 0.15% which was quite lower than the finding of this study.[12, 17]

From the present study we found that 36 cases (63.2%) of placenta previa was in the patients between the age of 26-35 years of age group. Findings of other researchers like Upreti et al (61%), Mustafa et al (56.52%), Majeed et al (47.36%), and Javed et al (45.8%) among the same age group is supportive to the findings of the present study.[12, 13, 18, 19] The reason behind this might be that most of the patients were from this age group.

From the current study, we noted that the incidence of placenta previa in cases with previously non-scarred uterus was 1.51%. These findings were supported by the findings of the work carried out by various authors such as Katke et al (0.47%), Mathuriya et al (0.47%), Parikh et al (0.49%) and To WW et al (0.75%) though their findings were slightly lower than what we observed in the present study.[11, 14-16] A similar study was carried by Majeed et al reported a comparatively higher incidence of placenta previa in subjects with previously non-scarred uterus (5.7%) though it was less that what they reported for the cases with scarred uterus in the same study.[19]

We found that the incidence of placenta previa in cases with a previous history of scarring of the uterus was 1.82%. This was supported by the findings of several other researchers like Katke

et al (1.33%), Mathuriya et al (1.2%), Parikh et al (1.14%), and To WW et al (1.31%) who have carried out similar research.[11, 14-16] Majeed et al in their study reported that the incidence of placenta previa in cases with scarred uterus was as high as 10.6%; when we compared this finding with the findings of the present study we found that it was much higher than the findings of this study.[19] Researchers like Hossain GA et al from their study concluded that there is an association between the increased gravidity and maternal age with the placenta previa.[20]

Numerous other researches are available which demonstrates that there is a strong correlation between an increase in cesarean procedures and placenta praevia in the subsequent pregnancy. Most of the studies shows that the incidence of placenta previa is higher in the subjects with previously scarred uterus than those without any history of scarring of the uterus though only few could establish a significant difference among the two groups. This might be due to that fact that Placenta previa is more likely to occur with rise in the number of uterine scars.

In the present study, we tried to establish an association between the scarring of uterus with placenta previa. As we did not consider about the other risk factors in the study, it limits the scope of the study. Hence, it is suggested that the researchers conduct similar studies with a comparatively larger sample size and also include other risk factors such as anemia, hypertension, and diabetes and correlate its association with placenta previa. Also, the grading of placenta previa can be done to look for the severity of the cases and their outcomes which was not done in the present study.

Lastly, as cesarean sections increase the risk of placenta previa, morbidly adherent placenta, and related issues in subsequent gestations, efforts should be made to lower the rate of these procedures.

CONCLUSIONS

The current study demonstrates that there were no appreciable variations in the incidence of placenta previa between cases with and without previously scarred uteri; however, the odds ratio indicates that subjects with a history of prior scarring uteri had a marginally higher chance of developing placenta previa.

Conflict of Interest: None.

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