

A Study of Various Factors Associated with Placenta Previa in Previous Non-Scar Uterus

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ABSTRACT

Background: Placental tissue is abnormally near the internal cervical os during the second and third trimesters of pregnancy significant risks of morbidity and mortality associated with illness for both the mother and the fetus. Effective counseling, close monitoring, early detection, and timely intervention are required. **Objective:** To determine the frequency of placenta previa in patients with previous non-scar uteruses. **Study Design:** Descriptive cross-sectional study. **Settings:** Department of Obstetrics & Gynecology, Khyber Teaching Hospital, Peshawar Pakistan. **Duration:** One-year of period (March 2022-March 2023). **Methods:** A total of 331 women between the ages of 20 and 40 were recruited for this study; these included singleton pregnancies, women with placenta previa in both scarred and non-scarred uteri, and women whose gestational ages were 28 weeks or older. SPSS version 20 was used, with a p-value of less than 0.05 regarded as statistically significant. **Results:** Of the 331 patients, with a mean age of 32.67 years, 17 (5%) were diagnosed with placenta previa. About 67% were multipara, and 65% were multigravida. No significant association was found between placenta previa and maternal age ($p=0.9745$), parity ($p=0.8314$), gravida status ($p=0.9823$), or history of cesarean sections ($p=0.8216$). **Conclusion:** It is concluded that there is a 5% prevalence of placenta previa in patients with a previous non-scarred uterus. Effective management of this condition, which can lead to severe complications, requires a multidisciplinary approach.

Keywords: Uterine curettage, Placenta previa, Fetomaternal Outcomes, Parity.

INTRODUCTION

Placenta previa is a pregnancy issue that mostly affects women in their second and third trimesters. It is characterized by the placenta inserting itself into the lower uterine tract, either totally or partly.¹ This syndrome is defined by the unusual closeness of the placental tissue to the internal cervical os. Depending on whether the placenta fully covers the cervical os or extends within 2 cm of the internal os, placenta previa can be categorized as total or marginal.² One well-established risk factor for placenta previa and placental abruption is surgical uterine cavity displacement.³ Placenta accreta is linked to placenta previa in about 10% of cases.⁴ Many known risk factors include smoking during pregnancy, multiparity, advanced maternal age, prior cesarean

sections, and numerous pregnancies. Past abortions, a history of placenta previa in prior pregnancies, cocaine use, and retained placenta are additional risk factors.⁵ According to statistics, the incidence of placenta previa increases dramatically with maternal age. It rises from 2% to 5% after age 40, a ninefold increase over women under 20.⁶

In the US, placenta previa affects 0.3-0.5% of all pregnancies, with other studies reporting an incidence of 0.4-0.8%.^{7,8} Women who have previously had a c-section birth are 1.5-5 times more likely to have one again, and if they have had many deliveries, the risk might reach 10%.⁹ The frequency of Placenta previa (PPs) is 32.45% in women with a non-scarred uterus, compared to 67.54% in those with a previously scarred uterus.¹⁰ The incidence is

rising alongside the increasing rate of cesarean sections, with a general occurrence of 1 in 200 births; 1 in 1000 cases are major, involving complete cervical coverage by the placenta.¹¹ Negative outcomes for mothers (34.15%) and fetuses (60.06%) are linked to placenta previa. Placenta previa-related major obstetrical hemorrhage accounts for around 30% of maternal mortality in the Asian population; this number is expected to rise as the number of c-sections increases.¹² Although placenta previa is relatively uncommon (3 to 9 per 1000 pregnancies), it remains a leading cause of uterine bleeding in late gestation and a significant risk factor for maternal morbidity and adverse fetal outcomes.¹³

Maternal complications of placenta previa include hemorrhage, increased need for blood transfusions, placental abruption, preterm delivery, a higher incidence of postpartum endometritis, and elevated mortality rates (2-3%).¹² Congenital malformations, greater newborn mortality rates (1.2%), fetal anemia, intergroup gene transfer (IUGR), sudden infant death syndrome (SIDS), respiratory distress, an increased risk of neurodevelopmental delays, low birth weight, Rh isoimmunization, and are examples of neonatal problems.^{14, 15} A comprehensive care strategy is needed for this life-threatening illness in order to lower the morbidity and death rates among mothers and newborns.¹⁶ Placenta previa is more common in women with myometrial injury and prior cesarean deliveries, particularly if the placenta covers the uterine scar anteriorly or posteriorly. Usually presenting as painless bleeding, placenta previa is diagnosed with ultrasonography, often with the addition of magnetic resonance imaging.¹⁷

In Khyber Pakhtunkhwa, Pakistan, this study aimed to ascertain the prevalence of placenta previa in a prior non-scarred uterus. There is a diversity of data and conflicting information in the existing literature, with varying strength of association for various potential risk factors and the possibility that confounding factors were not adequately controlled in previous studies. Considering these factors, this study was conducted to share its findings with local obstetricians, enabling them to offer effective counseling, closely monitor high-risk mothers, promptly detect complications, and implement timely interventions to reduce adverse fetomaternal outcomes.

METHODS

This year-long descriptive cross-sectional study was conducted by the Department of Obstetrics and Gynecology at Khyber Teaching Hospital in Peshawar between March 2022 and March 2023.

The sample size was calculated using the WHO calculator using the following parameters: 331 patients in total;

frequency percentage of placenta previa in non-scarred uteri at 5.70%; 95% confidence level; and 2.5% margin of error.¹⁸ The method used was a non-probability sequential sampling strategy.

Women between the ages of 20 and 40, placenta previa in uteri with or without scarring, singleton pregnancies, and gestations longer than 28 weeks were included in the study. Restrictions on entry included primigravida, bleeding during the second trimester, and uterine scars other than cesarean section scars, including myomectomy, as determined by radiological findings, clinical examination, and patient history.

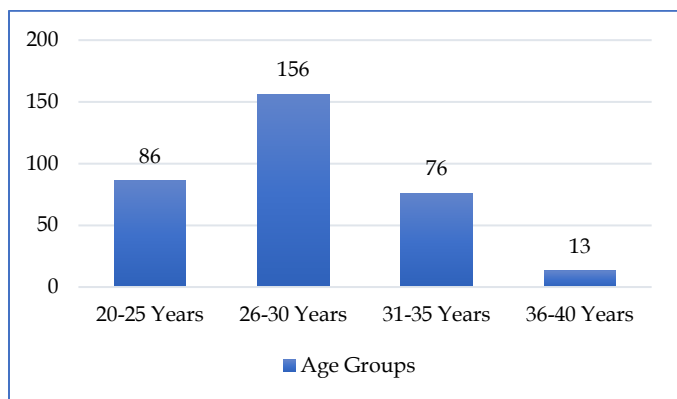
The College of Physicians and Surgeons Pakistan (CPSP) research committee and the hospital's ethics committee were permitted before the study could be conducted. Patients from the outpatient department (OPD) were chosen based on their compliance with the inclusion criteria. Every participant received information regarding the study's objectives, how the data would be used, and how the results would be published. Every patient provided written informed consent. Name, age, and residence were among the recorded demographic data. A comprehensive history was taken, followed by a detailed physical examination conducted by a physician. Baseline and specific investigations were performed. Abdominal grey-scale ultrasound was conducted on all patients by an experienced gynecologist with at least five years of experience in identifying placenta previa. All findings were recorded in a pre-designed proforma.

The SPSS program version 20 was used for the statistical analysis. Placenta previa, parity, history of prior cesarean sections, gravidity, and other categorical characteristics were all analyzed using frequencies and percentages. Age, gestational age, and the number of prior cesarean sections were examples of continuous variables for which mean and standard deviation were computed. The effect of adjustment was evaluated by stratifying PP according to age, gestational age, history of prior cesarean sections, gravidity, and parity. A p-value of less than 0.05 was deemed significant in the post-stratification chi-square test analysis.

RESULTS

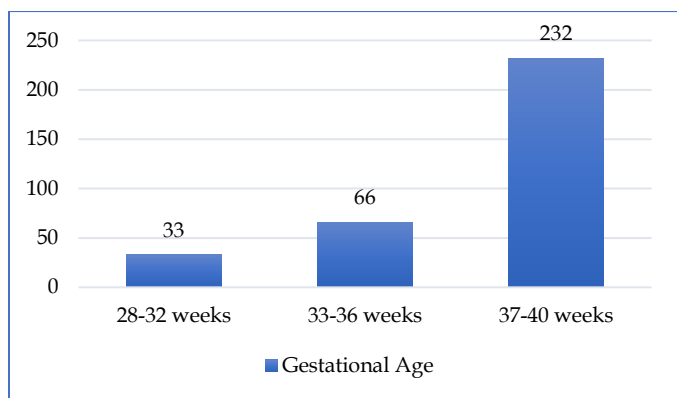
There were 331 patients in all in the research. The patients were 32.67 years old on average, with a standard deviation (SD) of ± 4.99 . The age distribution was as follows: 86 patients (26%) were in the 20-25 years age range, 156 patients (47%) were in the 26-30 years age range, 76 patients (23%) were in the 31-35 years age range, and 13 patients (4%) were in the 36-40 years age range, as shown in Figure 1.

Figure 1: Age distribution of the participants



Parity status among the 331 patients revealed that 109 patients (33%) were primiparous, while 222 patients (67%) were multiparous. The gravida status among the 331 patients indicated that 116 patients (35%) were primigravida, while 215 patients (65%) were multigravida. The period of gestation among the 331 patients was analyzed as follows: 33 patients (10%) were in the gestational age range of 28-32 weeks, 66 patients (20%) were in the range of 33-36 weeks, and 232 patients (70%) were in the range of 37-40 weeks. The mean gestation period was 36 weeks with a standard deviation (SD) of ± 4.21 , presented in Figure 2.

Figure 2: The gestational age of the participants



Among the 331 patients, 225 (68%) had C-sections, while 106 (32%) did not. For those with a history of C-sections, the analysis showed that 128 patients (57%) had undergone 2 or fewer C-sections, while 97 patients (43%) had undergone more than 2 cesarean sections. The mean number of previous C-sections was 2, with a standard deviation (SD) of ± 2.02 .

Association of Placenta Previa with Age, Parity, Gestational age and C-section

Among the 331 patients in the study, 17 (5%) were diagnosed with placenta previa, while 314 (95%) did not have the condition. Out of the 331 patients, the results showed that 4 patients, ages 20 to 25, 8 patients, ages 26

to 30, 4 patients, ages 31 to 35, and 1 patient, ages 36 to 40, had placenta previa. Six primiparous and eleven multiparous women were identified as having placenta previa among the patients. According to the results, six primigravida and eleven multigravida women had placenta previa. The association's p-value of 0.9823 suggests that placenta previa and gravida status are unrelated. Among the 331 patients, placenta previa affected 2 in the 28-32 week range, 3 in the 33-36 week range, and 12 in the 37-40 week range. There may not be a connection between placenta previa and gestational age, as shown by the p-value of 0.9485 for this link. Furthermore, the relationship between placenta previa and a history of prior cesarean sections was investigated using the chi-square test. Out of 331 patients, 12 who had a c-section and 5 who did not, are diagnosed with placenta previa. The p-value for this association was 0.8216, which indicates no relationship between previous c-sections and the occurrence of placenta previa, as shown in Table 1.

Table 1: Association of Placenta Previa with Age, Parity, Gravida, Gestational Age and C-section

Variables		Placenta Previa		
		Yes	No	p-value
Age groups	20 - 25 years	4	82	0.974
	26 - 30 years	8	148	
	31 - 35 years	4	72	
	36 - 40 years	1	12	
	Total	17	314	
Parity	Primi-para	6	103	0.831
	Multi-para	11	211	
	Total	17	314	
Gravida	Primi-gravida	6	110	0.982
	Multi-gravida	11	204	
	Total	17	314	
Gestational Age	28 - 32 weeks	2	31	0.948
	33 - 36 weeks	3	63	
	37 - 40 weeks	12	220	
	Total	17	314	
History of C-section	Yes	12	213	0.821
	No	5	101	
	Total	17	314	

DISCUSSION

Placenta previa is a serious obstetric problem that affects the health of both the mother and the fetus. This study aimed to determine the prevalence of placenta previa in women whose uteruses had not previously sustained scarring and shed light on the demographic traits and other risk factors related to placenta previa in the area. Aman *et al.*, reported a prevalence of placenta previa at approximately 6.3%, which is slightly higher than the 5% prevalence identified in our study.¹⁹ In contrast, Pema *et al.*, found a much lower prevalence of 0.7% (6 out of 843 cases), which is significantly lower than the 5% reported

in our study.²⁰ Similarly, Nazneen *et al.*, reported a prevalence of 1.84%,²¹ and Fan *et al.*, found a prevalence of 1.44% among Chinese pregnant women,²² Both of these prevalence rates are lower than the prevalence observed in our study. This difference in prevalence rates may be due to variations in study populations, methodologies, or regional factors affecting the incidence of placenta previa.

This study findings shows that a mean age of 32.67 years, and the 26–30-year age group had the highest frequency of placenta previa. Our analysis demonstrated no statistically significant correlation between maternal age and the presence of placenta previa ($p = 0.9745$), despite Faiz *et al.*, identifying advanced maternal age as a risk factor for placenta previa.²³ Pema *et al.*, reported no significant association between previous c-sections, multiparity, and the prevalence of PP, which aligns with our findings.²⁰

In our study, we did not find any statistically significant association between multiparity, gravida status, or previous cesarean sections with the existence of placenta previa. Conversely, the findings of Luke *et al.*, and Fan *et al.*, demonstrate that placenta previa is linked to multiparity and previous cesarean sections.^{22, 24}

Gestational age at diagnosis showed that most cases of placenta previa were identified in the later stages of pregnancy, particularly between 37 and 40 weeks. Despite this pattern, there was no statistically significant correlation ($p = 0.9485$) between gestational age and placenta previa. This finding is consistent with research by Pema *et al.*, which also revealed no significant correlation between placenta previa and gestational age.²⁰ One noteworthy conclusion from this investigation was the history of prior cesarean procedures. Placenta previa was more common in patients with a history of cesarean sections than in those without one, but this correlation was not statistically significant ($p = 0.8216$). This result is in line with research by Yazdani *et al.*, that found 19 instances (15.5%) out of 122 individuals with a history of cesarean sections had placenta previa.²⁵ Similarly, among 60 patients with placenta previa, Akram *et al.*, discovered that 14 (23.3%) had previously had a cesarean procedure.²⁶

CONCLUSION

In individuals with a prior non-scarred uterus, the prevalence of placenta previa was found to be 5% in our study, which is consistent with the range reported in the literature. Adequate management measures are crucial due to the accompanying consequences that affect mothers and newborns, such as bleeding, premature delivery, and higher mortality rates. Maternal age, parity, and cesarean sections are among the demographic characteristics and obstetric histories that are frequently

associated with an increased risk of placenta previa; however, their importance varies. Improving maternal and fetal outcomes requires ongoing observation, prompt diagnosis, and appropriate management.

LIMITATIONS

The study has several limitations that should be considered, including a single-center study, non-probability sampling, and cross-sectional design, which may not indicate the complications caused by the condition.

SUGGESTIONS / RECOMMENDATIONS

Further longitudinal studies comprising a larger population are required to provide insights into the progression of placenta previa over time and offer a better understanding of how risk factors influence the condition throughout pregnancy. A multidisciplinary approach involving obstetricians, radiologists, and researchers is recommended to improve the management and early detection of placenta previa, ultimately leading to better maternal and fetal outcomes.

CONFLICT OF INTEREST / DISCLOSURE

The authors have no conflict of interest.

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