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Original article

Clinical and Obstetric Characteristics Associated with Placenta Previa Type at Al-Bayda Medical Center: A Prospective Descriptive Study

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Abstract
Placenta previa is an obstetric condition associated with potentially serious maternal and fetal complications. The clinical and obstetric characteristics of affected women may vary according to the type of placenta previa. The objective of this study is to describe the clinical and obstetric characteristics of women diagnosed with placenta previa at Al-Bayda Medical Center and to assess the associations between selected maternal and obstetric characteristics and placenta previa type. This prospective descriptive study was conducted at Al-Bayda Medical Center from January 14, 2025, to September 30, 2025. The study included 100 pregnant women diagnosed with placenta previa. Data were collected prospectively using a structured data collection form and analyzed using IBM SPSS Statistics. Descriptive statistics were used to summarize the participants' characteristics, and chi-square tests were applied to examine associations between selected categorical variables and placenta previa type. A p-value of less than 0.05 was considered statistically significant. Results: Among the 100 participants, 57 (57%) had total placenta previa, while 43 (43%) were classified as having partial placenta previa or low-lying placenta. Initial analyses indicated statistically significant associations between placenta previa type and maternal age group, previous cesarean section, parity category, and previous placenta previa. No statistically significant association was observed between infertility treatment and placenta previa type. The statistical significance of the association with multiple gestation requires confirmation because of the small number of multiple pregnancies
Key words. Placenta Previa; Clinical Characteristics; Obstetric Characteristics; Cesarean Section**;** Maternal Age.

Introduction

Known as a significant obstetric complication, placenta previa occurs when the placenta implants abnormally in the lower section of the uterus, encroaching upon the internal cervical opening. The most critical risk associated with this condition is severe bleeding. This hemorrhaging usually starts when the lower uterus stretches and lengthens before delivery. As the cervix subsequently thins and dilates, the placenta detaches from the uterine wall, triggering the bleed.[1]. From a physiological standpoint, the anatomical positioning of placenta previa within the lower uterine segment can impair normal placental vascularization, leading to the defective development of its blood vessels [2]. Accordingly, Placenta previa is clinically categorized into four main types according to the extent of involvement of the cervical os: low-lying, marginal, partial, and complete placenta previa. [3]. While the pathogenesis of the disease is not clearly understood, placenta previa is connected with adverse maternal and fetal outcomes, including adherence of the placenta, antepartum hemorrhage, postpartum hemorrhage, malpresentation, intrauterine growth restriction (IUGR), thrombophlebitis, preterm labor, and septicemia [4]. In particular, Placenta previa represents approximately one-third of all cases of antepartum hemorrhage (APH). Moreover, abnormal placental implantation has become one of the leading indications for peripartum hysterectomy. [5].

Historically, placenta previa was categorized using a four-grade system: Grade I (minor), where the placental edge occupies the lower uterine segment; Grade II, where it reaches the internal cervical os; Grade III, where it partially covers the internal os; and Grade IV, where the placental tissue completely obstructs it. While Grades I and II were traditionally classified as minor, Grades III and IV were designated as major placenta previa. Current updated classifications now offer a more precise description of associated complications, such as postpartum hemorrhage (PPH), with the objective of optimizing clinical obstetrical management [6,7]. Additionally, obstetric hemorrhage remains one of the leading causes of maternal morbidity and mortality globally. Placenta previa is also linked to considerable maternal morbidity and an increased risk of adverse outcomes, contributing significantly to maternal health complications.

[8]. Additionally, defective placental attachment is now the main cause of peripartum hysterectomy, and placenta previa itself contributes to one-third of all antepartum hemorrhage (APH) instances. Beyond these hazards, affected women are highly vulnerable to anemia and profound blood loss. Remarkably, cesarean sections due to placenta previa carry an approximate 12-fold increase in blood transfusion requirements compared to other cesarean births. Other related risks include prolonged hospital admission, venous thromboembolism, postpartum hemorrhage (PPH), and emergency cesarean hysterectomy [4]. Placenta previa affects an estimated 3 to 5 out of every 1,000 pregnancies worldwide. This frequency is steadily increasing, a rise that is linked to the growing number of cesarean sections being performed. This phenomenon is associated with lower uterine scarring, an anatomical factor that can cause the placenta to implant abnormally low. [9]. With the rising rate of cesarean sections and the trend toward advanced maternal age, cases of Placenta previa and its related complications, including placenta accreta, are expected to keep increasing.

[10]. A critical analysis of the risk factors associated with placenta previa reveals that a history of uterine surgery is among the most significant contributors. Specifically, a prior cesarean section is a major risk factor, as the presence of a uterine

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scar can interfere with normal placental implantation, leading to lower segment attachment. Additionally, a history of dilatation and curettage (D&C) or previous episodes of placenta previa in earlier pregnancies significantly elevates the risk for subsequent gestations. This study investigates these surgical and clinical factors to determine their prevalence and impact in our local clinical setting [11]. Besides surgical history, demographic factors including advanced maternal age (over 30 years) and multiparity are consistently associated with abnormal placentation. Moreover, the growing utilization of assisted reproductive techniques (ARTs) further adds complexity to the risk profile.[4]. Other important risk factors include cigarette smoking, which may lead to compensatory placental enlargement, and multiple gestations, which increase the demand for a larger placental attachment surface. In addition, a previous history of uterine surgeries such as myomectomy is associated with a higher risk of low placental implantation. Examining these variables is crucial for achieving a comprehensive epidemiological understanding of the condition within the study population.[12]. This study was conducted to describe the clinical and obstetric characteristics of women diagnosed with placenta previa at Al-Bayda Medical Center and to assess the associations between selected maternal and obstetric characteristics and placenta previa type.

Methods

This prospective descriptive study was carried out at Al-Bayda Medical Center from January 14, 2025, to September 30, 2025. The study involved 100 pregnant women diagnosed with placenta previa who were identified and monitored after their admission to the hospital during the study period. Data were collected prospectively through a structured data collection sheet that included maternal age, parity, history of previous cesarean section, prior uterine surgeries, smoking status, and other relevant obstetric variables.

Ethical approval was obtained prior to the study, and informed consent was received from all participants. Participant confidentiality and anonymity were fully preserved. For statistical analysis, the collected data were analyzed using IBM SPSS Statistics.

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. In addition, the Chi-square test was applied to assess the association between categorical variables, and a p-value of less than 0.05 was considered statistically significant. The findings were presented in tables and charts to facilitate clear interpretation and comparison of the results.

Results

Table 1 presents the baseline sociodemographic and clinical characteristics of the study participants (N = 100). The largest proportion of women were aged 30–39 years (45%), followed by those aged 40 years and above (35%), while 5% were below 20 years of age. Regarding educational level, 48% of the participants had a diploma, 39% had a university education or higher, and 13% had completed secondary school.

Most participants lived in urban areas (76%), while 24% lived in rural areas. Regarding occupational status, 54% were unemployed, and 46% were employed. In terms of parity, 53% of the participants had fewer than four previous births, while 47% had four or more previous births. Regarding previous obstetric history, 50% of the participants had no previous cesarean section, 27% had one previous cesarean section, and 23% had two or more. A previous history of placenta previa was reported by 12% of participants, whereas 88% had no such history. Singleton pregnancies accounted for 95% of the cases, while multiple gestation accounted for 5%. In addition, 87% of participants had no history of infertility treatment, while 13% had received infertility treatment. Regarding placenta previa type, 57% of the participants were classified as having total placenta previa, while 43% were classified as having partial placenta previa or low-lying placenta, according to the categories recorded in the study data. These findings describe the sociodemographic and obstetric characteristics of women diagnosed with placenta previa at Al-Bayda Medical Center.

Table 1. Baseline Characteristics and Clinical Data of the Enrolled Patients **(N=100)**

Variable	Frequency	Percentage %
Age Group		
Below 20	5	5%
20–29	15	15%
30 – 39	45	45%
40 and above	35	35%
Educational Level		
secondary school	13	13%
Diploma	48	48%
University & Above	39	% 39
Residence		
Urban	76	76%
Rural	24	%24
Occupational Status		

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Employed	46	46%
Unemployed	54	54%
Multiparty		
less than 4	53	53%
4 and more	47	47%
Previous C-Section		
none	50	50%
One CS	27	27%
Two or more CS	23	23%
Previous Placenta Previa		
No	88	88%
Yes	12	12%
Multiple Gestation		
single	95	95%
multiple	5	5%
Infertility Treatment		
No	87	87%
Yes	13	13%
Placenta Type		
Total Placenta Previa	57	57%
Partial/Low Placenta Previa	43	43%

Table 2 presents the associations between selected maternal and obstetric characteristics and placenta previa type among the study participants. The initial Pearson chi-square analyses indicated statistically significant associations between placenta previa type and maternal age group ($\chi^2 = 30.187$, $p < 0.001$), previous cesarean section ($\chi^2 = 46.169$, $p < 0.001$), parity category ($\chi^2 = 13.893$, $p < 0.001$), and previous placenta previa ($\chi^2 = 10.287$, $p = 0.001$).
Regarding maternal age, total placenta previa was observed in 28 women aged 30–39 years and 28 women aged 40 years and above. For previous cesarean section, all 23 women with two or more previous cesarean sections were classified as having total placenta previa, whereas 38 of the 50 women without a previous cesarean section were classified as having partial placenta previa or low-lying placenta.

Table 2. Chi-Square Analysis of the Association between Risk Factors and Type of Placenta Previa (N = 100)

Variables	Total Placenta Previa n (%)	Partial/Low Placenta Previa n (%)	Total n (%)	Pearson Chi-Square	p.value
Age Group					
Below 20	0	5	5	30.187[a]	0.001>
20–29	1	14	15		
30–39	28	17	45		
40 and above	28	7	35		
Previous C-Section					
None	12	38	50	46.169[a]	0.001>
One CS	22	5	27		
Two or more CS	23	0	23		
Multiparty					
Less than 4	21	32	53	13.893[a]	0.001>
4 and more	36	11	47		
Previous Placenta Previa					
No	45	43	88	10.287[a]	0.001
Yes	12	0	12		
Multiple Gestation					
Single	52	43	95	3.970[a]	0.046
Multiple	5	0	5		
Infertility Treatment					
Yes	8	5	13	0.126[a]	0.723
No	49	38	87		

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Parity category was also associated with placenta previa type in the initial analysis. Among women with fewer than four previous births, 21 had total placenta previa and 32 had partial placenta previa or low-lying placenta. Among women with four or more previous births, 36 had total placenta previa and 11 had partial placenta previa or low-lying placenta.
A statistically significant association was also observed between previous placenta previa and the type of placenta previa in the current pregnancy. All 12 women who reported a previous history of placenta previa were classified as having total placenta previa.
The initial Pearson chi-square result for multiple gestation was $\chi^2 = 3.970$ ($p = 0.046$). However, this finding requires confirmation using an appropriate exact test because only five participants had multiple pregnancies. No statistically significant association was observed between infertility treatment and placenta previa type ($\chi^2 = 0.126$, $p = 0.723$).
These findings describe associations between selected maternal and obstetric characteristics and placenta previa type among women already diagnosed with placenta previa. Because the study did not include a comparison group of women without placenta previa, these results cannot establish risk factors for the occurrence of the condition.

Discussion

The present study demonstrates a statistically significant association between maternal age and type of placenta previa ($\chi^2 = 30.187$, $p < 0.001$), providing important insight into its clinical distribution within the study population. The results show that total placenta previa was most frequently observed among women aged 30–39 years (28 cases) and those aged 40 years and above (28 cases), whereas partial/low-lying placenta previa was more common in younger women, particularly those aged 20–29 years (14 cases). Notably, no cases of total placenta previa were recorded among women below 20 years of age. This pattern suggests that maternal age may be associated with the distribution of placenta previa types among the women included in this study. However, because all participants were diagnosed with placenta previa, these findings cannot establish advanced maternal age as a risk factor for the occurrence of the condition. This finding is in agreement with the study by Oyelese et al., which reported that the risk of Placenta previa increases markedly with advancing maternal age, attributed to age-related changes in the endometrial environment and uterine blood vessel structure[13]. Another comparable study likewise reported a significant association between advanced maternal age and abnormal placental implantation, including placenta previa.[14]. These findings are consistent with previous studies [13, 14], which reported an association between maternal age and placenta previa. The increased occurrence of placenta previa among older women has been discussed in previous research in relation to reduced endometrial receptivity, cumulative uterine vascular changes, and a higher likelihood of prior uterine interventions with age. In the present study, maternal age was significantly associated with the distribution of placenta previa types among the included women. However, because all participants had placenta previa, the present findings cannot establish advanced maternal age as an independent risk factor for the occurrence of the condition.

This study revealed a highly significant association between prior cesarean section and placenta previa type ($\chi^2 = 46.169$, $p < 0.001$), showing a marked increase in risk among women with a history of two or more cesarean deliveries. This suggests a clear dose–response pattern, where the likelihood of abnormal placental implantation increases progressively with the number of uterine scars. This finding is strongly supported by a large population-based study conducted by Marshall N. E. et al., which found that the risk of placenta previa increases significantly with previous cesarean delivery, particularly after repeated cesarean sections, due to uterine scarring and impaired endometrial regeneration[15]. Similarly, a well-established cohort study by Silver R. M. reported that previous cesarean delivery is among the most significant risk factors for placenta previa and placenta accreta spectrum disorders, with the risk progressively increasing in relation to the number of cesarean sections. [4]. In contrast, several studies have indicated that although the association is strong, the overall risk following a single cesarean delivery remains relatively low. This suggests that additional factors, such as advanced maternal age and parity, may also play a contributory role in the development of Placenta previa.[16].
This study demonstrated a statistically significant association between multiparity and placenta previa type ($\chi^2 = 13.893$, $p < 0.001$), with total placenta previa observed among women with parity of four or more. This suggests that parity is associated with the distribution of placenta previa types among the women included in this study. This finding is supported by a population-based study conducted by Oyelese et al., which reported an association between multiparity and placenta previa, likely due to cumulative uterine trauma and altered endometrial vascularization.[13].
This study demonstrated a statistically significant association between previous history of placenta previa and the current type of placenta previa ($\chi^2 = 10.287$, $p = 0.001$). The findings show that all women with a previous history of placenta previa (12 cases) developed total placenta previa in the current pregnancy, while no cases of total placenta previa were observed among those with no prior history (45 cases of total placenta previa vs. 43 partial/low-lying cases). This pattern indicates an association between a previous history of placenta previa and the current type of placenta previa among the women included in this study. Evidence from a retrospective cohort study by Lizi Zhang et al. demonstrated that a history of placenta previa is associated with an increased risk of recurrence in subsequent pregnancies, independent of other obstetric factors such as previous cesarean section and maternal age. The study suggested that persistent endometrial or vascular abnormalities may contribute to repeated abnormal placental implantation[17]. Likewise, Marshall N. E. et al.

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reported that a previous history of placenta previa is associated with an increased risk of recurrence, supporting the possibility of an underlying long-term uterine susceptibility to abnormal placental implantation [15].

This study demonstrated a statistically significant association between multiple gestation and placenta previa type (χ^2 = 3.970, p = 0.046). However, the distribution between singleton and multiple pregnancies was relatively uneven, with most cases occurring in singleton pregnancies (95 cases) compared to multiple gestations (5 cases). Although statistical significance was observed, the small number of multiple gestation cases should be considered when interpreting these findings, as it may limit the strength of the observed association and its clinical generalizability.

This finding is partially consistent with the population-based study by Oyelese et al., which reported that although multiple pregnancy may be associated with an overall increase in obstetric complications, it is not considered a strong independent risk factor for placenta previa after adjusting for confounding variables such as maternal age and previous uterine surgery. The slight statistical significance observed in the present study may therefore be influenced by the distribution of other related risk factors.[13].

Across the analyzed variables, most maternal and obstetric factors showed statistically significant associations with the type of placenta previa. However, infertility treatment was the only factor that did not demonstrate a statistically significant relationship in the present study (χ^2 = 0.126, p = 0.723). Although a slightly higher proportion of partial/low-lying placenta previa was observed among women who received infertility treatment (8 vs. 5 cases), this difference was not statistically meaningful. Overall, the distribution of total and partial placenta previa was relatively similar between women who had infertility treatment and those who did not, indicating that no statistically significant association was observed between infertility treatment and placenta previa type in this study population.

This finding is in agreement with a cohort study conducted by Jauniaux E. et al., which indicated that assisted reproductive techniques may be linked to abnormal placentation in general. However, the association with placenta previa specifically remains inconsistent and is frequently influenced by confounding factors such as advanced maternal age and underlying causes of infertility [18].

Conclusion

In conclusion, the present study identified statistically significant associations between several maternal and obstetric characteristics and placenta previa type within the studied population. Maternal age, previous cesarean section, parity, and a history of placenta previa were associated with the type of placenta previa, highlighting differences in the distribution of placenta previa types among the women included in this study. The findings also demonstrated an association between the number of previous cesarean sections and placenta previa type, as well as an association between a previous history of placenta previa and its type in the current pregnancy. In contrast, multiple gestation showed a weaker association, while infertility treatment did not exhibit a statistically significant relationship with placenta previa type. Overall, the study describes the clinical and obstetric characteristics of women diagnosed with placenta previa and highlights associations between selected maternal and obstetric characteristics and placenta previa type. These findings may contribute to understanding the variation in placenta previa types among affected women and may inform further research involving appropriate comparison groups.

Conflict of interest. Nil

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