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FETOMATERNAL OUTCOMES IN PATIENTS WITH PLACENTA PREVIA AND PREVIOUS CESAREAN SECTION

Original Research

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ABSTRACT

Background: Placenta previa is a critical obstetric condition often associated with previous cesarean deliveries and presents a heightened risk of severe maternal and fetal complications. Its rising prevalence is closely linked to the global increase in cesarean section rates. The condition is known to cause significant hemorrhagic events and adverse perinatal outcomes. Early diagnosis, appropriate antenatal surveillance, and specialized obstetric care are crucial to minimize the associated risks and improve clinical outcomes.

Objective: To determine the prevalence and spectrum of feto-maternal outcomes in pregnancies complicated by placenta previa with a history of previous cesarean section.

Methods: This descriptive cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Khyber Teaching Hospital, Peshawar, from November 1, 2024, to April 30, 2025. A total of 270 pregnant women aged 16 to 40 years, with gestational age over 28 weeks and a history of cesarean section, were enrolled. Placenta previa was confirmed through ultrasound, and feto-maternal outcomes were evaluated. Outcomes assessed included antepartum hemorrhage, postpartum hemorrhage, renal impairment, maternal mortality, stillbirth, preterm delivery, and NICU admission. Data were analyzed using SPSS version 25.

Results: The mean age of participants was 30.44 ± 5.39 years, mean gestational age was 34.42 ± 4.88 weeks, and mean BMI was 23.90 ± 2.55 kg/m². Maternal mortality was observed in 61 patients (22.6%), antepartum hemorrhage in 49 (18.1%), postpartum hemorrhage in 45 (16.7%), and renal impairment in 45 (16.7%). Fetal outcomes included 50 stillbirths (18.5%), 35 preterm births (13.0%), and 17 NICU admissions (6.3%).

Conclusion: Placenta previa in women with a history of cesarean section poses substantial risks to both maternal and fetal health. Increased maternal mortality, hemorrhagic complications, and fetal losses emphasize the need for vigilant antenatal care and delivery planning in well-equipped centers.

Keywords: Cesarean Section, Maternal Mortality, Neonatal Intensive Care Units, Placenta Previa, Pregnancy Complications, Premature Birth, Stillbirth.

INTRODUCTION

Placenta previa, a condition characterized by the abnormal implantation of the placenta over or near the cervical os, poses significant risks for both the mother and fetus during pregnancy and delivery (1). It is a leading cause of antepartum hemorrhage, accounting for over one-fifth of bleeding episodes in the third trimester, and is associated with several serious complications such as preterm delivery, postpartum hemorrhage, and increased maternal morbidity and mortality (1,2). Although its precise etiology remains uncertain, the condition has been linked to various risk factors including uterine scarring, prior cesarean sections, advanced maternal age, multiple gestations, smoking, cocaine use, dilation and curettage procedures, and assisted reproductive technologies (2,3). The clinical impact of placenta previa varies depending on its classification, with complete placenta previa presenting the highest risk. Current literature emphasizes that the type and extent of placental coverage significantly influence obstetric outcomes (4). The growing global prevalence of placenta previa—estimated at 3–5 cases per 1,000 pregnancies—is largely attributed to the increasing rate of cesarean deliveries, which may contribute to defective placental implantation in the lower uterine segment due to scar formation (4,5). In Asian populations, postpartum hemorrhage related to placenta previa contributes to approximately 30% of maternal deaths, underlining the severity of the condition and the urgent need for optimized clinical management (5).

Previous studies have reported alarming statistics: in a cohort of 196 women with placenta previa and previous cesarean delivery beyond 28 weeks of gestation, 95.9% experienced antepartum hemorrhage, 86.7% required multiple blood transfusions, and 41.3% suffered from postpartum hemorrhage (6). Furthermore, maternal mortality reached 1.5%, while 7.1% underwent cesarean hysterectomy and 25.5% developed renal complications. Neonatal outcomes were similarly concerning, with a 53.1% preterm birth rate, 35.2% NICU admissions, 17.9% intrauterine deaths (IUD), and a 27% stillbirth rate (7). Another study found that among 100 women with prior cesarean deliveries, 19% developed placenta previa, and postpartum hemorrhage occurred in 58% of cases. Maternal mortality and cesarean hysterectomy were reported in 5.3% and 10.5% of patients, respectively, while 16% of neonates were stillborn (8). Despite these concerning findings, there remains a paucity of contemporary research specifically examining the feto-maternal outcomes of pregnancies complicated by placenta previa in the context of prior cesarean deliveries. Many existing studies are dated and may not reflect recent advances in obstetric care or the current epidemiological trends (9,10). This gap in literature highlights the need for updated evidence to inform clinical practice and policy. Therefore, the objective of the present study is to determine the prevalence and pattern of adverse feto-maternal outcomes among women presenting with placenta previa following cesarean delivery. The findings aim to enhance clinical awareness, promote timely referrals, and ultimately reduce the burden of maternal and neonatal complications associated with this high-risk obstetric condition.

METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Khyber Teaching Hospital, Peshawar, over a six-month period from November 2024 to April 2025. A total of 270 pregnant women aged 16 to 40 years with a documented history of previous cesarean section and a confirmed diagnosis of placenta previa in the current pregnancy were enrolled. Placenta previa was diagnosed via ultrasound, defined as placental implantation less than 2 cm from the internal cervical os or completely covering the cervix at or after 21 weeks of gestation. The gestational age at the time of evaluation was more than 28 weeks for all participants. Patients with coexisting conditions such as bleeding diathesis, multiple pregnancies, or uterine rupture were excluded to maintain homogeneity and minimize confounding variables. Sampling was conducted using a non-probability consecutive sampling technique, and the calculated sample size of 270 was based on an anticipated maternal mortality rate of 1.5%, with a 1.45% margin of error and a 95% confidence level (11). Ethical approval was obtained from the Institutional Review Board (IRB) of the hospital as well as the College of Physicians and Surgeons Pakistan (CPSP), and informed consent was secured from all participants prior to inclusion in the study. Each woman underwent a complete obstetric clinical assessment including a detailed history, general physical and systemic examinations with emphasis on abdominal and vaginal findings. Demographic variables such as name, age, gestational age, occupation (housewife, manual worker, office executive), socioeconomic status, education level, and residential background (urban or rural) were recorded. Participants were advised on regular antenatal follow-ups and were instructed to report immediately in case of abdominal pain, vaginal bleeding, or leakage of fluid. Each case was followed until 24 hours postpartum or until the termination of pregnancy.

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The feto-maternal outcomes assessed included antepartum hemorrhage (defined as vaginal bleeding prior to delivery), postpartum hemorrhage (defined as blood loss exceeding 1000 ml within 24 hours after delivery), renal impairment (serum creatinine >1.5 mg/dL), maternal mortality (death during delivery or within 42 days postpartum), mode of delivery (vaginal or cesarean), hysterectomy, live birth, stillbirth (birth of an infant with no signs of life), preterm delivery (birth before 37 completed weeks of gestation), and neonatal intensive care unit (NICU) admission. All operational definitions followed standard clinical guidelines to ensure uniform data interpretation. Data were collected using a structured, pre-designed proforma and entered into SPSS version 25 for statistical analysis. Continuous variables such as age and gestational age were expressed as mean ± standard deviation, while categorical variables were summarized as frequencies and percentages. Stratification was applied to control for potential effect modifiers. Post-stratification, the chi-square test was used to assess associations, with a p-value of less than 0.05 considered statistically significant.

RESULTS

The mean age of the study participants was 30.44 ± 5.39 years, while the mean gestational age was 34.42 ± 4.88 weeks. The average body mass index (BMI) was 23.90 ± 2.55 kg/m². Parity ranged from 1 to 7, with a mean of 3.37 ± 1.75. More than half of the women (51.9%) were above 30 years of age, and 57.4% were evaluated beyond 36 weeks of gestation. BMI of 24.0 kg/m² or less was recorded in 58.9% of participants. A majority of women (56.3%) had a history of multiple cesarean sections. Regarding education, 59.3% had education above matriculation, and 70.0% were unemployed. In terms of maternal outcomes, maternal mortality was the most frequent, observed in 22.6% of participants. Antepartum hemorrhage was present in 18.1%, and postpartum hemorrhage occurred in 16.7%. Renal impairment, defined by elevated serum creatinine levels, was also seen in 16.7% of patients. Fetal outcomes revealed that 18.5% of pregnancies resulted in stillbirths, while 13.0% were born prematurely. Admission to the neonatal intensive care unit (NICU) was required for 6.3% of the neonates. The overall live birth rate was 81.5%.

Table 1: Descriptive statistics of study participants (n = 270)

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age (years)	270	21	40	30.44	5.392
PoG (weeks)	270	24	40	34.42	4.884
BMI (kg/m^2)	270	19.4	29.1	23.903	2.5525
Parity	270	1	7	3.37	1.751

Table 2: Baseline demographics and clinical parameters of study participants (n = 270)

Parameters	Subgroups	Frequency	Percent
Age (years)	30 or below	130	48.1
	Above 30	140	51.9
G Age (weeks)	36 or below	115	42.6
	more than 36	155	57.4
BMI (kg/m^2)	24.0 or below	159	58.9
	More than 24.0	111	41.1
Parity	3 or below	138	51.1
	More than 3	132	48.9
Number of CS	Single	118	43.7
	Multiple	152	56.3
Education	Matric or below	110	40.7
	Above matric	160	59.3
Profession	Employed	81	30.0
	Unemployed	189	70.0

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Table 3: Maternal outcomes among study participants (n = 270)

Maternal outcomes	Subgroups	Frequency	Percent
APH	Yes	49	18.1
	No	221	81.9
PPH	Yes	45	16.7
	No	225	83.3
Renal Impairment	Yes	45	16.7
	No	225	83.3
Maternal mortality	Yes	61	22.6
	No	209	77.4

Table 4: Fetal outcomes among study participants (n = 270)

Fetal outcomes	Subgroups	Frequency	Percent
Birth status	Alive	220	81.5
	Still birth	50	18.5
Prematurity	Yes	35	13.0
	No	235	87.0
NICU admission	Yes	17	6.3
	No	253	93.7

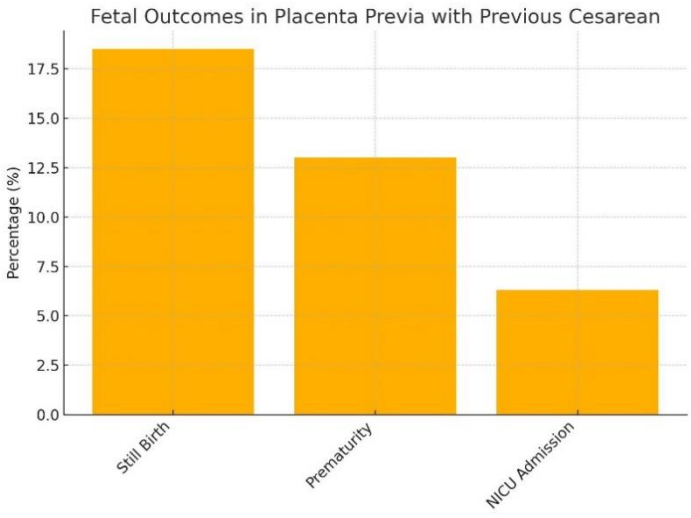

Figure 2 Fetal Outcomes in Placenta Previa with Previous Cesarean

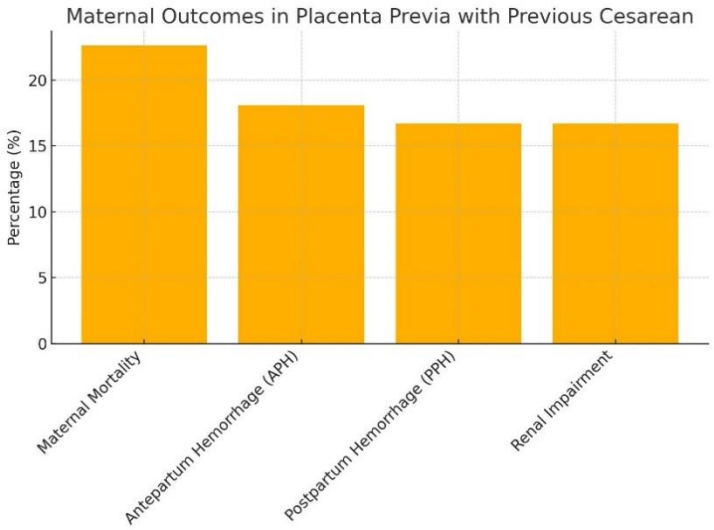

Figure 1 Maternal Outcomes in Placenta Previa with Previous Cesarean

DISCUSSION

The findings of this study reaffirmed the strong association between placenta previa and a history of previous cesarean sections, a trend that has been increasingly recognized in global obstetric literature. While international prevalence of placenta previa ranges from 0.2% to 4.84% (8,9), higher rates have consistently been reported in Asian populations compared to those in European or Sub-Saharan African regions, indicating regional variation not solely attributable to ethnic background (11). The marked increase in morbidly adherent placenta (MAP) over recent decades has been attributed to the rising rate of cesarean deliveries worldwide (12), a relationship echoed by this study, where a substantial proportion of patients with MAP had undergone three or more prior cesarean sections. A considerable number of these women experienced severe complications, including massive hemorrhage, disseminated intravascular coagulation, renal and bladder injury, and required peripartum hysterectomy—leading to irreversible loss of fertility at a relatively young age. Nearly half

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of all perinatal hysterectomies in contemporary obstetrics are now associated with MAP (13,14). The maternal morbidity pattern observed in this study—especially antepartum and postpartum hemorrhage, renal impairment, and maternal mortality—aligns with existing evidence on placenta previa and MAP, where significantly elevated risk of hemorrhagic and surgical complications is consistently documented (15,16). Women with MAP, in particular, are at even greater risk for requiring massive blood transfusions and experiencing life-threatening surgical outcomes compared to those with non-adherent placenta previa.

The maternal case fatality rate observed in this study, although concerning, was attributable in part to delayed referrals and prior substandard care at peripheral facilities often staffed by non-specialized personnel. This reflects a critical challenge in low-resource and rural settings where timely access to specialized care remains inconsistent. The lack of structured antenatal care in many such cases likely exacerbated outcomes (17). However, among patients who received appropriate antenatal follow-up, clinical preparedness—such as pre-arranged blood availability and coordinated multidisciplinary management—was associated with improved maternal survival. These findings are consistent with regional studies reporting higher maternal mortality in settings where antenatal services are underutilized or inaccessible (18,19). In contrast, facilities with robust prenatal care models have reported reduced mortality despite significant morbidity. Fetal outcomes in the current analysis were relatively favorable, with a majority of neonates born alive and at term, and many presenting with normal birth weights and satisfactory APGAR scores. This suggests a relatively low prematurity rate compared to other studies. Nevertheless, stillbirths remained a significant concern. Differences in booking status, referral timing, and quality of antenatal monitoring may account for the variability seen in perinatal outcomes across different studies (20). While some previous literature documents poor neonatal outcomes, including preterm birth and low birth weight—others report better outcomes when antenatal care is optimized. Interventions such as timely steroid administration, bed rest, and preparation for emergent hemorrhagic events have been shown to significantly reduce perinatal morbidity.

One of the strengths of this study is its focus on a well-defined high-risk obstetric population with standardized outcome definitions and a relatively robust sample size. However, limitations must also be acknowledged. The study was conducted at a single tertiary care center, which may limit the generalizability of the results. Additionally, data on certain key maternal outcomes, including mode of delivery and incidence of cesarean hysterectomy, were not included in the presented results despite being relevant to the research objective. Future studies should ensure comprehensive outcome reporting and could benefit from a multi-center design to enhance external validity. Despite these limitations, the study contributes valuable evidence to the growing body of literature emphasizing the importance of antenatal surveillance, timely intervention, and cesarean section rate control to reduce the burden of placenta previa and its complications. Continued efforts should focus on strengthening referral systems, improving rural obstetric care, and promoting education on birth spacing and surgical delivery indications to minimize unnecessary cesarean procedures.

CONCLUSION

Placenta previa remains a significant obstetric challenge, particularly in women with a history of cesarean deliveries. This study highlights the critical impact of prior surgical births on feto-maternal outcomes, reinforcing the importance of proactive prenatal care and timely intervention. While maternal morbidity is high, mortality and severe complications can be minimized through early diagnosis, antenatal surveillance, and management in well-equipped facilities by multidisciplinary teams. The findings underscore the urgent need to promote rational use of cesarean sections and enhance awareness among healthcare providers and communities about the risks of placenta previa, ensuring safe delivery practices and improved outcomes for both mothers and neonates.

AUTHOR CONTRIBUTION

Author	Contribution
Hira Bibi	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Shazima Khan*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Ayesha Jehangir	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published

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Author	Contribution
Roshni Mumtaz	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Nur Taimur	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Marjeena Khan	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Hamdosh Bangash	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Khu Faryal Shah Pervez	Writing - Review & Editing, Assistance with Data Curation

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