



## Original Article



## Maternal And Neonatal Outcome in Major Degree Placenta Praevia

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## ABSTRACT

Placenta praevia relates to pregnancy complications where the placenta is positioned on, or covers the relevant cervix region thus leading to uncontrolled bleeding as being its major risk. The evaluation of mother and fetus outcomes of primary degree placenta praevia is quite important for constructive management and prevention policies to be put in place. **Objective:** To measure the incidence of negative fetomaternal outcomes in patients with major degree placenta praevia. **Methods:** This descriptive cross-sectional study was carried out at the Mardan Medical Complex Mardan in the Department of Obstetrics and Gynaecology from the 21<sup>st</sup> of October to the 31<sup>st</sup> of December 2024. The sample population includes 177 pregnant women with major degree placenta praevia who were monitored until delivery and 30 days after the birth of the child. **Results:** The mean maternal age was  $29.25 \pm 2.10$  years, gestational age was  $29.32 \pm 1.44$  weeks, and weight was  $67.08 \pm 6.17$  kg. Associated maternal morbidity encompassed obstetric hysterectomy (14.1%) and bladder injury (11.3), postpartum hemorrhage (24.3%), sip and gout infections (18.6%), and preterm labor (16.9%) with little relations being observed with maternal factors ( $p > 0.05$ ). Some neonatal outcomes included NICU admission (18.6%), while stillbirth had some numbers reported around (15.8%) along with low Apgar scores (15.3%) where once again no significant associations with maternal factors were found ( $p > 0.05$ ). **Conclusion:** Clinical patterns indicate elevated risks with severe placenta praevia, which calls for close observation even if no statistically significant relationships have been observed.

## INTRODUCTION

Placenta praevia is a pregnancy complication characterized by the placement of the placenta near or over the cervix. Placenta praevia has been categorized into two types: complete and marginal previa. Complete previa refers to the placenta fully covering the cervical os, while marginal previa occurs when the leading edge of the placenta is within 2 cm of the internal os but does not completely cover it [1]. The global incidence of placenta praevia is estimated to be 3-5 per 1000 pregnancies, and this rate is increasing due to the rising number of caesarean sections [2]. Research indicates the prevalence of placenta praevia to be around 0.7% [3, 4]. The incidence

is higher in mid-pregnancy compared to 36 weeks and later, likely due to the formation of the lower uterine segment and a process called trophotropism, which may lead to the resolution of placenta praevia [5]. Radwan *et al.*, (2018) assessed maternal outcomes in placenta previa cases with and without morbidly adherent placenta at a tertiary hospital in Saudi Arabia [6]. Another study by Levin G *et al.*, revealed that in women with major degree placenta praevia, the frequency of postpartum hemorrhage was 28%, stillbirth 16%, low Apgar score 16%, NICU admission 36%, and neonatal jaundice 24% [7]. Several studies have attempted to identify risk factors for placenta praevia and



have shown associations with advanced maternal age (with prevalence around 1% in women aged 30–39 and increasing to 2% in women above 40), parity, maternal smoking, infertility treatments, previous caesarean deliveries, previous placenta praevia, and recurrent abortions [8, 9]. Among these risk factors, the rates of caesarean sections, advanced maternal age, and infertility treatments have all increased over the past decades [10]. Neonates born to mothers with placenta praevia are more likely to experience preterm birth, perinatal death, congenital malformations, and low Apgar scores (below 7 at both 1 and 5 minutes) [11]. Studies also indicate that most of these neonates require resuscitation and NICU admission, and a significant outcome of this condition is the increased risk of small-for-gestational-age infants and low birth weight [12]. Complications of placenta praevia extend beyond the antepartum period, affecting the intrapartum and postpartum course, with higher rates of cesarean delivery, peripartum hysterectomy, morbid placental adherence, and postpartum hemorrhage [13]. Previous research has estimated the rate of hysterectomy among women with placenta praevia to be around 5% [14]. Pregnancies complicated by placenta praevia also show significantly higher rates of postpartum anemia and prolonged hospital stays. The optimal treatment for hemorrhage related to placenta praevia is particularly poor in the low-income populations. Additionally, there is a lack of clinical research to support evidence within this area. Assessing maternal and fetal outcomes in women with major degree placenta praevia may help formulate effective management and preventative strategies which would mitigate the problems associated with this condition.

Major degree placenta praevia remains a high-risk obstetric condition associated with substantial maternal and neonatal complications, including postpartum hemorrhage, hysterectomy, bladder injury, stillbirth, and NICU admissions. Although previous studies have documented these adverse outcomes, limited local evidence from low-resource settings like Pakistan exists regarding the frequency of these complications and the influence of maternal demographic factors on fetomaternal outcomes. This study's objective was to estimate the level of occurrence and associated maternal morbidity as well as identify sociodemographic factors that could complicate pregnancies with placenta praevia.

## METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at Mardan Medical Complex, Mardan, from 21<sup>st</sup> October to 31<sup>st</sup> December 2024. A total of 177 participants were included in the study [14]. The sample size was calculated using WHO sample size software, with a frequency of bladder injury of 13.2%, a margin of error of 5%, and a 95% confidence

interval. The estimation of sample size was based on statistical principles applicable to comparable research, although no particular previous studies were considered. The participants were selected using non-probability convenient sampling. Inclusion criteria consisted of women aged 18–35 years with a singleton pregnancy, gestational age between 27–32 weeks according to their Last Menstrual Period (LMP), parity between 1 and 4, and major degree placenta praevia as per the operational definition. A certified radiologist used transabdominal and/or transvaginal ultrasonography to confirm the diagnosis of major degree placenta praevia. When the placenta covered the internal cervical os entirely or in part, it was categorized as significant placenta praevia. Exclusion criteria included a history of placental abruption, coagulation disorders, diabetes, or hypertension. Participants with diseases that could have an impact on the study's results were excluded in order to reduce confounding variables. Among these were a history of diabetes, hypertension, coagulation problems, placental abruption, or any other systemic disease that may affect the health of the mother or the newborn. After obtaining ethical approval from Bacha Khan Medical College with Ref. No. 622/BKMC on dated 21-10-2024 and informed consent, patients meeting the inclusion criteria were selected from the indoor department of obstetrics and gynecology. Basic demographic information, including age, gestational age, parity, and weight, was recorded. The women were under careful observation during their hospital stay, from the time of admission to delivery and for 30 days after giving birth. Regular evaluation of the mother's vital signs, blood pressure, and blood loss measurement were all part of the monitoring procedure. Maternal and newborn outcomes were systematically evaluated using standardized procedures and checklists in compliance with the National Institute for Health and Care Excellence (NICE) recommendations (NG229) [14]. Postpartum hemorrhage, obstetric hysterectomy, bladder damage, wound infection, premature labor, and other peripartum problems were among the maternal outcomes. NICU hospitalization, poor Apgar scores, infant jaundice, and stillbirth were among the neonatal outcomes. All pertinent information was documented in a structured proforma based on standardized fetomaternal evaluation criteria, and these outcomes were tracked during the hospital stay and for 30 days after giving birth. Fetomaternal outcomes were documented on a specially designed proforma (<https://www.nice.org.uk/guidance/ng229>). Clinical diagnosis and hospital records were used to identify maternal problems, including preterm labor, postpartum hemorrhage, bladder damage, obstetric hysterectomy, and wound infections. During the hospital stay, the amount of blood units transfused for patients who needed assistance for surgical complications or postpartum hemorrhage was noted. These diseases were treated according to standard

hospital care procedures, which included antibiotic medication for wound infections, surgical intervention for severe instances such as bladder damage, and blood transfusions for postpartum hemorrhage. Data were analyzed using SPSS version 23.0. The statistical study regarded gestational age, parity, and maternal age as independent variables. The Chi-square test was used to evaluate these factors' effects on fetomaternal outcomes after they were divided into suitable groups. As shown in Tables 3 and 4, the findings showed no statistically significant relationships ( $p > 0.05$ ) between these factors and the observed outcomes for mothers and newborns. The Discussion section has covered the potential causes of these results.

## RESULTS

This study enrolled 177 participants with a mean age of  $29.25 \pm 2.10$  years, ranging from 18 to 35 years. The mean parity was  $2.03 \pm 0.94$ , indicating that most women had around two previous pregnancies. The mean gestational age at the time of the study was  $29.32 \pm 1.44$  weeks, while the mean weight of the participants was  $67.08 \pm 6.17$  kg. These demographic details are summarized in Table 1.

**Table 1:** Demographic Characteristics of the Participants

Demographics	Mean $\pm$ SD
Age (Years)	29.248 $\pm$ 2.10
Parity	2.033 $\pm$ 0.94
Gestational Age (Weeks)	29.316 $\pm$ 1.44
Weight (Kg)	67.084 $\pm$ 6.17

The maternal and neonatal outcomes in women with major degree placenta praevia revealed several significant complications (Table 2). Among the maternal outcomes, obstetric hysterectomy was performed in 14.1% ( $n=25$ ) of the cases, while bladder injury occurred in 11.3% ( $n=20$ ) of the women. Postpartum hemorrhage was observed in 24.3% ( $n=43$ ), and 18.6% ( $n=33$ ) experienced wound infections. Preterm labor occurred in 16.9% ( $n=30$ ) of the participants. In terms of neonatal outcomes, 18.6% ( $n=33$ ) of newborns required admission to the NICU, while stillbirth

was reported in 15.8% ( $n=28$ ) of cases. Additionally, 15.3% ( $n=27$ ) of newborns had a low Apgar score at birth. Patients who needed transfusions received an average of  $2.5 \pm 1.8$  blood units; in few instances, the maximum documented amount was 8 units.

**Table 2:** Maternal and Neonatal Outcomes in Women with Major Degree Placenta Praevia

Outcome	Frequency (%)
Obstetric Hysterectomy	25 (14.1%)
Bladder Injury	20 (11.3%)
Postpartum Hemorrhage	43 (24.3%)
Wound Infection	33 (18.6%)
Preterm Labor	30 (16.9%)
NICU Admission	33 (18.6%)
Stillbirth	28 (15.8%)
Low Apgar Score	27 (15.3%)

The results of cross-tabulation and Chi-square tests are presented for various maternal and neonatal outcomes, stratified by age, parity, gestational age, and weight. For obstetric hysterectomy, 14.1% of patients underwent the procedure, with no statistically significant difference based on age groups ( $p=0.861$ ), parity ( $p=0.310$ ), gestational age ( $p=0.415$ ), or weight ( $p=0.910$ ). Similarly, bladder injury occurred in 11.3% of cases, and no significant association was found with age ( $p=0.570$ ), parity ( $p=0.617$ ), gestational age ( $p=0.296$ ), or weight ( $p=0.173$ ). In terms of postpartum hemorrhage, 24.3% of the patients experienced this complication. However, the results indicated no significant difference in the occurrence of postpartum hemorrhage with respect to age ( $p=0.420$ ), parity ( $p=0.696$ ), gestational age ( $p=0.707$ ), or weight ( $p=0.245$ ). Wound infections occurred in 18.6% of the patients, but there were no significant associations with age ( $p=0.198$ ), parity ( $p=0.150$ ), gestational age ( $p=0.475$ ), or weight ( $p=0.102$ ). For preterm labor, 16.9% of patients experienced preterm labor, and again, no significant associations were found with age ( $p=0.712$ ), parity ( $p=0.295$ ), gestational age ( $p=0.864$ ), or weight ( $p=0.592$ ) (Table 3).

**Table 3:** Stratification of Maternal Outcomes and Correlation analysis

Variable		Hysterectomy			Bladder Injury			Postpartum Hemorrhage			Wound Infection		
		Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value
Age (Years)	18-30	13.8	86.2	0.860	12.2	87.8	0.570	26	74	0.420	21.1	78.9	0.190
	>30	14.8	85.2		9.3	90.7		20.4	79.6		13	87	
Parity	1-2	12.2	87.8	0.310	12.2	87.8	0.610	25.2	74.8	0.690	21.7	78.3	0.150
	3-4	17.7	82.3		9.7	90.3		22.6	77.4		12.9	87.1	
Gestational Age (Weeks)	27-30	12.9	87.1	0.410	9.8	90.2	0.290	25	75	0.700	17.4	82.6	0.470
	>30	17.8	82.2		15.6	84.4		22.2	77.8		22.2	77.8	
Weight (kg)	$\leq 65$	14.5	85.5	0.910	7.2	92.8	0.170	29	71	0.240	24.6	75.4	0.100
	>>65	13.9	86.1		13.9	86.1		21.3	78.7		14.8	85.2	

Regarding neonatal outcomes, admission to NICU was necessary for 18.6% of newborns, with no significant relationship with maternal age ( $p=0.099$ ), parity ( $p=0.323$ ), gestational age ( $p=0.787$ ), or weight ( $p=0.257$ ). The incidence of stillbirth was 15.8%,

with no significant association found between stillbirth and age ( $p=0.838$ ), parity ( $p=0.934$ ), gestational age ( $p=0.316$ ), or weight ( $p=0.218$ ). Lastly, low Apgar scores were observed in 15.3% of cases, with no significant correlations with age ( $p=0.424$ ), parity ( $p=0.812$ ), gestational age ( $p=0.678$ ), or weight ( $p=0.527$ ) (Table 4). Standard clinical criteria were used to characterize neonatal outcomes, such as stillbirth, poor Apgar scores, and NICU admission. Neonatals who needed acute care because to respiratory distress, low birth weight, or preterm were admitted to the NICU. An Apgar score of less than 7 at the first and fifth minutes of delivery was considered low. The lack of evidence of life at birth, as verified by clinical evaluation, led to the documentation of stillbirth.

**Table 4:** Stratification of Neonatal Outcomes and Correlation Analysis

Variable	Categories	Preterm Labor			Admission to NICU			Still Birth			Low Apgar Score		
		Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value	Yes (%)	No (%)	p-Value
Age (Years)	18-30	16.3	83.7	0.712	15.4	84.6	0.099	15.4	84.6	0.838	13.8	86.2	0.424
	>30	18.5	81.5		25.9	74.1		16.7	83.3		18.5	81.5	
Parity	1-2	14.8	85.2	0.295	16.5	83.5	0.323	15.7	84.3	0.934	14.8	85.2	0.812
	3-4	21	79		22.6	77.4		16.1	83.9		16.1	83.9	
Gestational Age (Weeks)	27-30	16.7	83.3	0.864	18.2	81.8	0.787	17.4	82.6	0.316	15.9	84.1	0.678
	>30	17.8	82.2		20	80		11.1	88.9		13.3	86.7	
Weight (kg)	≤65	18.8	81.2	0.592	14.5	85.5	0.257	11.6	88.4	0.218	17.4	82.6	0.527
	>>65	15.7	84.3		21.3	78.7		18.5	81.5		13.9	86.1	

## DISCUSSION

In this study, there were no statistically significant correlations ( $p > 0.05$ ) between fetomaternal outcomes and mother age, parity, gestational age, or weight. This result is in contrast to some earlier research that found these characteristics significantly influenced pregnancy problems in cases with placenta praevia. The very small sample size could have made it more difficult to identify minute variations, which could be one explanation for this lack of statistical significance. The results in this sample may also have been impacted by differences in maternal health status, hospital procedures, and clinical care approaches. Certain clinical patterns, such as increased rates of postpartum hemorrhage and newborn problems, imply that these variables may still play a function in deciding maternal and neonatal outcomes, even though the statistical data did not show significant relationships. To investigate these associations more thoroughly, additional research with bigger sample numbers and stronger analytical techniques could be required. The rate of obstetrics hysterectomies was 14.1%. In total, 15.8% of neonates were delivered stillborn, and of the surviving infants, 18.6% were admitted to NICU. Intraoperative bladder injuries were reported in 11.3% of cases. 18.6% of cases have been caused by wound infection. In a study by Sultana has shown that frequency of obstetrics hysterectomies was 15.1%, bladder injury 13.2%, wound infection 17.3%, preterm birth 22.1%, admission to NICU 25.9%, still birth was 13.2% in women with major degree placenta praevia [6]. Khan et al., (2024) conducted a prospective study to determine the frequency of maternal morbidities in patients with placenta praevia in Hazara Division [12]. An analysis of 535 women with placenta praevia by Long et al., in (2021) from China revealed that

Antepartum Hemorrhage (APH) was substantially linked to poor outcomes for both mothers and newborns [15]. In a large population-based study, the prevalence of PP was reported as low as 0.28 [16]. A systematic review showed that the prevalence of PP is influenced by numbers of previous cesarean scars, with a rate of 1%, 2.8%, and 3.7% after 1, 3 and 5 cesarean deliveries, respectively [17]. According to their findings, short cervical length, anterior placental position, and full placenta praevia were important risk factors for APH. According to the study, the largest risk of complications due to APH was associated with prior uterine artery embolization (OR: 11.706) [18]. According to the study, 31.52% of women had had evacuation and curettage operations, while 88.04% of women had a history of cesarean sections. Placenta praevia was substantially correlated with these characteristics. High rates of complications were seen in the maternal outcomes: 34.78% needed ICU hospitalization, 21.73% had a hysterectomy, and 75% got blood transfusions. On the neonatal side, 23.19% needed NICU hospitalization, 38.04% were preterm, and 25% had low birth weight [19]. This difference in prevalence rates of PP among researchers may be explained by the lack of the general consensus on clinical definition of placenta accreta, increta and percreta. The current definition is based on histological findings after hysterectomy has been performed. Furthermore, most of these studies are retrospective and hospital-based in nature, this results in the overestimation of the true prevalence of placenta accreta, as many of these cases were referred from non-tertiary hospitals. The average consumption of  $2.5 \pm 1.8$  units of blood and the 14.1% need for a hysterectomy indicate the severity of complications associated with placenta accreta, even

though no maternal fatalities were reported in our investigation. Loverro *et al.*, in (2022) supported this by comparing placental pathology and newborn outcomes in a prospective research that evaluated 439 pregnancies [17]. This study by Moeini *et al.*, evaluates the maternal and neonatal outcomes in patients with abnormal placentation, including placenta previa and accreta, through a case-control design. The authors highlight significantly higher rates of hemorrhage, preterm birth, and NICU admission in affected pregnancies. The paper emphasizes the need for early diagnosis and multidisciplinary management to mitigate risks [20]. Xie *et al.*, conducted a cohort study comparing maternal and neonatal complications in placenta previa cases with and without previous cesarean sections. Their findings show that a history of cesarean delivery increases the risk of adverse outcomes such as postpartum hemorrhage and neonatal intensive care admission. The study underscores the long-term obstetric implications of cesarean delivery [21]. In summary, while the study didn't find clear associations, the high rates of complications emphasize the need for careful monitoring and proactive management in this high-risk group. Clinicians should consider these trends and observations, even if they don't meet the threshold for statistical significance, to ensure the best possible outcomes for both mothers and their babies.

The study was limited by its single-center design, relatively small sample size, non-probability convenient sampling, and short follow-up period, which may reduce generalizability and statistical power to detect significant associations. Additionally, exclusion of certain high-risk comorbidities may have limited broader clinical applicability. Future multicenter studies with larger, more diverse populations, longer follow-up durations, and advanced analytical models are recommended to better identify predictive risk factors and strengthen evidence-based management protocols for placenta praevia.

## CONCLUSIONS

This study showed clinical data indicate that women with significant degree placenta praevia may be more susceptible to maternal problems including postpartum bleeding, obstetric hysterectomy, and bladder damage, even though statistical significance was not proven in this study. Low Apgar scores, stillbirth, and NICU hospitalization were among the neonatal issues noted. Despite not being statistically significant, these trends show that careful monitoring and management of these situations are necessary to enhance outcomes and safety for both mother and child.

## Authors' Contribution

Conceptualization: NK

Methodology: SS

Formal analysis: FB, MM

Writing and Drafting: AS, SS, FB, MM, RIK, NK

Review and Editing: AS, SS, FB, MM, RIK, NK

All authors approved the final manuscript and take responsibility for the integrity of the work

## Conflicts of Interest

All the authors declare no conflict of interest.

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