Pakistan Journal of Intensive Care Medicine
eISSN: 2708-2261; pISSN: 2958-4728
www.pjicm.com
DOI: https://doi.org/10.54112/pjicm.v5i01.87
Pak. J. Inten. Care Med., volume 2025: 87
Original Research Article

MATERNAL AND FETAL OUTCOMES IN PREGNANCIES COMPLICATED BY PLACENTA PREVIA

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(Received, 25th April 2025, Revised 30th May 2025, Accepted 05th June 2025, Published 10th June 2025)

ABSTRACT

Background: *Placenta previa is a significant obstetric complication associated with increased maternal and neonatal morbidity. It often leads to adverse outcomes such as postpartum hemorrhage, cesarean delivery, and preterm birth, necessitating timely diagnosis and multidisciplinary management.* ***Objective:*** *To evaluate maternal and fetal outcomes in pregnancies complicated by placenta previa.* ***Study Design:*** Cross-sectional *study.* ***Setting:*** *The department of Obs and Gynae of Lady Reading Hospital, Peshawar, Pakistan.* ***Duration of Study:*** *02-10-2024 to 02-04-2025.* ***Methods:*** *A total of 139 pregnant women aged 18–35 years with singleton pregnancies beyond 28 weeks of gestation were included. Placenta previa was diagnosed via ultrasound. Maternal outcomes assessed included mode of delivery, postpartum hemorrhage (PPH), anemia, and ICU admission. Neonatal outcomes evaluated were preterm birth, low birth weight (LBW), Apgar scores at 5 minutes, and NICU admissions. Data were analyzed using descriptive statistics; results are presented as frequencies, percentages, and means with standard deviations.* ***Results:*** *The mean maternal age was 28.24 ± 4.89 years. Cesarean section was the mode of delivery in 74.1% of cases. Postpartum hemorrhage occurred in 22.3% of patients, and anemia was documented in the same proportion. ICU admission was required in 15.8% of cases. Among neonates, the preterm birth rate was 51.8%, with 30.9% having low birth weight. NICU admission was needed for 23.0% of newborns, and 14.4% had low Apgar scores (<7) at 5 minutes.* ***Conclusion:*** *Pregnancies complicated by placenta previa are associated with a high risk of adverse maternal and neonatal outcomes, including postpartum hemorrhage, cesarean delivery, preterm birth, and NICU admissions. Early identification and multidisciplinary care are essential to optimize outcomes for both mother and child.*

Keywords: Placenta Previa, Maternal Outcomes, Neonatal Outcomes, Postpartum Hemorrhage, Preterm Birth, Cesarean Section

INTRODUCTION

Placenta previa (PP) describes the condition in which the placenta either entirely or partially covers the internal os of cervix (1, 2). It represents a significant risk factor for postpartum hemorrhage, potentially resulting in mortality and morbidity for both the mother as well as neonate. This condition precludes a safe vaginal delivery, requiring a cesarean delivery for neonate. Most cases are identified early in pregnancy via sonography, while others might go to emergency room with painless vaginal bleeding during second or third trimester of pregnancy. PP has been linked with an elevated risk of placenta accreta in women (3). The etiology of PP stays unidentified. An association exists between endometrial damage as well as uterine scarring (4). Risk factors associated with PP include advanced maternal age, cocaine use, multiparity, previous suction as well as curettage procedures, assisted reproductive technology, a previous history of cesarean sections, as well as prior instances of PP (5, 6). Women diagnosed with placenta previa, as well as those having a history of C-sections, exhibit an elevated risk for placenta accreta spectrum. Risk for placenta accreta, trimester wise is in first (3%), second (11%), third (40%), fourth (61%), and fifth (67%) (7). The outcomes for mothers as well as perinatal health in cases of PP are critical, given the potential for significant mortality and morbidity for both the mother as well as fetus. Maternal complications can encompass severe hemorrhage and emergency C-section, potentially resulting in adverse outcomes such as hysterectomy as well as maternal death (8-10). Perinatal complications, including preterm birth, IUGR, as well as neonatal morbidity and mortality, frequently occur in pregnancies affected by PP, underscoring the necessity for effective management methods (11).

Despite advancements in obstetric care, PP remains a major contributor to maternal morbidity as well as perinatal complications worldwide. Comprehending the distinct maternal and fetal outcomes linked to this condition is crucial for enhancing antenatal management and delivery strategies, along with neonatal care. This study evaluates both maternal as well as fetal outcomes in pregnancies complicated by PP, contributing to evidence-based strategies to reduce adverse events and enhance obstetric care quality in high-risk pregnancies.

METHODOLOGY

This study employed a cross-sectional design, conducted at the department of Obs and Gynae of Lady Reading Hospital, Peshawar, from 02-10-2024 to 02-04-2025 after securing ethical certificate from the hospital. We selected one hundred and thirty-nine patients based on a previously reported frequency of low Apgar scores (15.3%) (12) among placenta previa cases, 95% confidence interval, and 6% margin of error. Patients aged 18-35 years who were having singleton pregnancies beyond 28 weeks gestation were enrolled by non-probability consecutive sampling. Patients were identified through routine antenatal ultrasound examinations, which confirmed placenta previa defined as placental tissue covering or lying within 2cm of the internal cervical OS. Patients having multiple gestations, known fetal anomalies, and pre-existing maternal conditions were not enrolled. After taking consent from the enrolled patients, data collection was started, which involved a detailed review of medical records for demographic characteristics and delivery outcomes. Maternal parameters included mode of delivery, postpartum hemorrhage, anemia, and admission to ICU. Neonatal outcomes were assessed through by their birth weight, Apgar scores at 1 and 5 minutes, preterm birth, and NICU admission requirements. Data analysis was done using SPSS 24. Maternal age, parity, and gestational age were calculated using mean and SD, while fetomaternal outcomes were assessed using frequency and percentages. Stratifications were

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performed between fetomaternal outcomes and demographics using the Chi Square test, keeping the P value notable at < 0.05.

RESULTS

Our study involved 139 patients with a mean maternal age of 28.24 ± 4.89 years. The average gestational age was 36.27 ± 1.95 weeks, and the mean parity was 3.15 ± 1.04. Regarding the maternal outcomes cesarean section was performed in 103 (74.1%) cases while vaginal delivery occurred in 36 (25.9%) cases. Postpartum hemorrhage was observed in 31 (22.3%) women, and an equal proportion, 31 (22.3%) were diagnosed with anemia. Intensive care unit admission was required for 22 (15.8%) patients.

For fetal outcomes, preterm birth was recorded in 72 (51.8%) neonates, and low birth weight (<2500 grams) was noted in 43 (30.9%) infants. Admission to the neonatal intensive care unit (NICU) was necessary for 32 (23.0%) newborns while low Apgar scores (<7 at 5 minutes) were observed in 20 (14.4%) cases. Stratification of fetomaternal outcomes with age, parity, and gestational age can be seen from Table 3 to Table 5.

Table 1: Maternal outcomes

Maternal outcomes		N	%
Caesarean section	Yes	103	74.1%
	No	36	25.9%
PPH	Yes	31	22.3%
	No	108	77.7%
Anemia	Yes	31	22.3%
	No	108	77.7%
ICU admission	Yes	22	15.8%
	No	117	84.2%

Table 2: Fetal outcomes

Fetal outcomes		N	%
Preterm birth	Yes	72	51.8%
	No	67	48.2%
Low birth weight (> 2500g)	Yes	43	30.9%
	No	96	69.1%
NICU admission	Yes	32	23.0%
	No	107	77.0%
Low APGAR (< 7 at 5 mins)	Yes	20	14.4%
	No	119	85.6%

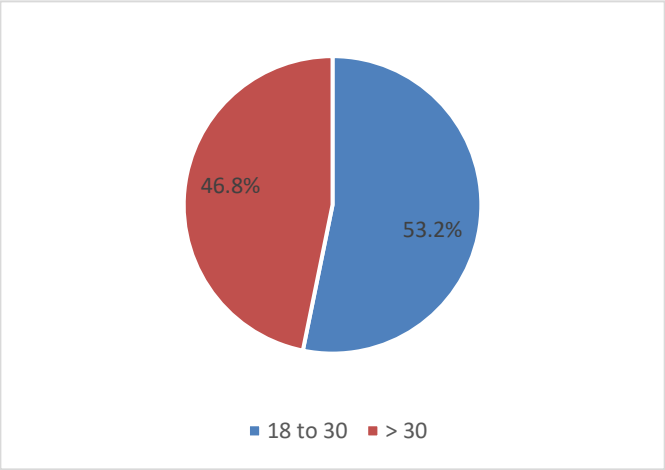

Figure 1: Maternal age distribution

Table 3: Stratification of fetomaternal outcomes with maternal age

Fetomaternal outcomes		Age distribution (Years)				P value
		18 to 30		> 30		
		N	%	N	%	
ICU admission	Yes	14	63.6%	8	36.4%	0.28
	No	60	51.3%	57	48.7%	
PPH	Yes	15	48.4%	16	51.6%	0.53
	No	59	54.6%	49	45.4%	
Caesarean section	Yes	57	55.3%	46	44.7%	0.40
	No	17	47.2%	19	52.8%	
Anemia	Yes	17	54.8%	14	45.2%	0.83
	No	57	52.8%	51	47.2%	
Preterm birth	Yes	37	51.4%	35	48.6%	0.65
	No	37	55.2%	30	44.8%	
Low birth weight (> 2500g)	Yes	17	39.5%	26	60.5%	0.03
	No	57	59.4%	39	40.6%	
NICU admission	Yes	14	43.8%	18	56.2%	0.22
	No	60	56.1%	47	43.9%	
LowAPGAR (< 7 at 5 mins)	Yes	10	50.0%	10	50.0%	0.75
	No	64	53.8%	55	46.2%	

Table 4: Stratification of fetomaternal outcomes with parity

Fetomaternal outcomes		Parity				P value
		1 to 2		> 2		
		N	%	N	%	
ICU admission	Yes	12	54.5%	10	45.5%	0.07
	No	40	34.2%	77	65.8%	
PPH	Yes	11	35.5%	20	64.5%	0.80
	No	41	38.0%	67	62.0%	
Caesarean section	Yes	40	38.8%	63	61.2%	0.55
	No	12	33.3%	24	66.7%	

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Anemia	Yes	10	32.3%	21	67.7%	0.50
	No	42	38.9%	66	61.1%	
Preterm birth	Yes	26	36.1%	46	63.9%	0.74
	No	26	38.8%	41	61.2%	
Low birth weight (> 2500g)	Yes	10	23.3%	33	76.7%	0.02
	No	42	43.8%	54	56.2%	
NICU admission	Yes	9	28.1%	23	71.9%	0.21
	No	43	40.2%	64	59.8%	
LowAPGAR (< 7 at 5 mins)	Yes	5	25.0%	15	75.0%	0.21
	No	47	39.5%	72	60.5%	

Table 5: Stratification of fetomaternal outcomes with gestational age

Fetomaternal outcomes		**Gestational age (Weeks)**				**P value**
		29 to 35		**> 35**		
		N	%	N	%	
ICU admission	Yes	11	50.0%	11	50.0%	0.02
	No	31	26.5%	86	73.5%	
PPH	Yes	10	32.3%	21	67.7%	0.77
	No	32	29.6%	76	70.4%	
Caesarean section	Yes	26	25.2%	77	74.8%	0.03
	No	16	44.4%	20	55.6%	
Anemia	Yes	9	29.0%	22	71.0%	0.87
	No	33	30.6%	75	69.4%	
Preterm birth	Yes	42	58.3%	30	41.7%	0.0001
	No	0	0.0%	67	100.0%	
Low birth weight (> 2500g)	Yes	17	39.5%	26	60.5%	0.10
	No	25	26.0%	71	74.0%	
NICU admission	Yes	14	43.8%	18	56.2%	0.05
	No	28	26.2%	79	73.8%	
LowAPGAR (< 7 at 5 mins)	Yes	10	50.0%	10	50.0%	0.03
	No	32	26.9%	87	73.1%	

DISCUSSION

The findings from our study underscore the complex clinical challenges associated with placenta previa. Maternal age of our cohort averaged 28.24 ± 4.89 years, which is consistent with the demographic trends observed in other studies like Kollmann et al., where the mean age was 31.6 years, and Asid et al. reported 28.6 ± 4.5 years (13, 14). This suggests that placenta previa frequently affects women in their late twenties to early thirties a pattern reinforced by Dwivedi et al., where 51.1% of patients were aged 20–30 years (15). The mean gestational age of our study was 36.27 ± 1.95 weeks, reflecting a trend toward preterm delivery, a hallmark of placenta previa management. This aligns closely with Kollmann et al. where 54.9% of deliveries occurred before 37 weeks.13 The high preterm delivery rate highlights the clinical imperative to balance fetal maturity against the risks of antepartum hemorrhage. Cesarean section rates of our study were (74.1%) lower than the 91.2% reported by Kollmann et al. and 85.5% by Dwivedi et al. Wasim et al. in their study reported that all of their selected patients underwent C-section (13, 15, 16). This variation may reflect differences in clinical protocols or the severity of placental implantation, as Wasim et al. focused on morbidly adherent placenta (MAP) cases, which often necessitate hysterectomy, whereas the current study did not stratify by placental adherence severity.

Postpartum hemorrhage (PPH) occurred in 22.3% of cases, comparable to the 24.3% reported by Shah et al., but higher than the 7.1% in Kollmann et al (12, 13). This discrepancy may stem from differing definitions of PPH or variations in surgical expertise. Anemia affected 22.3% of patients lower than the 30.1% reported by Kollmann et al (13). Neonatal outcomes revealed a preterm birth rate of 51.8%, consistent with the 54.9% in Kollmann et al. and 55.8% by Asid et al. These findings reinforce the strong association between placenta previa and preterm delivery (13, 14). Low birth weight (<2500 g) affected 30.9% of neonates slightly lower than the 35.6% reported by Kollmann et al., but higher than the 26.7% by Wasim et al. (13, 16). This may reflect regional disparities in neonatal care or differences in gestational age at delivery. Admission to the neonatal intensive care unit (NICU) was needed for 23.0% of infants, a rate which is intermediate between 18.6% by Shah et al. and 27.3% by Asid et al (12, 14).

Low Apgar scores (<7 at 5 minutes) occurred in 14.4% of cases which resonated with Shah et al. they observed that 15.3% neonates had lower than 7 APGAR score at 5 mins, but our frequency of low APGAR is higher than the 5.8% in Kollmann et al. suggesting variability in intrapartum resuscitation practices or fetal monitoring protocols (12, 13). The findings advocate for enhanced prenatal surveillance to identify placenta previa early, coupled with multidisciplinary care that involve obstetricians, hematologists, and neonatologists. The high preterm birth rate necessitates targeted steroid administration and neonatal readiness. Additionally, the variability in PPH rates across studies calls for standardized protocols for hemorrhage management. Future research should explore regional disparities in outcomes and the impact of conservative surgical techniques on fertility preservation.

CONCLUSION

In conclusion, placenta previa patients are at greater risk of developing PPH, undergoing cesarean delivery, preterm birth, and neonatal intensive care admission, which highlights the need for vigilant antenatal monitoring and multidisciplinary management to optimize outcomes for both mother and baby.

DECLARATIONS

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Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB-599/LRH/MTI)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declared an absence of conflict of interest.

AUTHOR CONTRIBUTION

***SIDRA HASSAN KHEL* (Trainee Medical Officer)**
Conception of Study, Data Collection, Data Entry, Data Analysis, Study Design, Review of manuscript, Manuscript drafting.
***SAIMA KHATTAK* (Assistant Professor)**
Manuscript revisions, critical input.
***FARYAL KHAN* (Trainee Medical Officer)**
Critical Input
***AYESHA FAYYAZ* (Trainee Medical Officer)**
Review of Literature.

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