

## Original Article

# Different Types of Placenta Previa and Association with Pregnancy Outcomes at a Tertiary Care Hospital of Developing Country

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## Abstract

**Objective:** To determine the frequency of different types of placenta previa (PP) and its association with pregnancy outcomes in a tertiary care hospital of developing country.

**Methodology:** This descriptive cross-sectional study was done at department of Obstetrics & Gynecology of Federal Government Polyclinic Islamabad After taking approval from the hospital's Ethical Committee. Study duration was one year from 1st Jan., 2023 to 31st December 2023. Pregnant women visiting antenatal OPD with low lying placenta on ultrasound in third trimester, women coming to labour room or emergency with Antepartum hemorrhage and having low lying placenta on ultrasound and those who were referred to obstetric department by any clinic or hospital of either age of women and parity were included. Types of placenta were determined by ultrasound or MRI. All the information was collected via study proforma and analyzed using SPSS version 26.

**Results:** A total of 55 women having placenta previa were studied, with 89.1% aged over 25 years. Majority of women (65.5%) were admitted through the outpatient department, and 94.5% were booked patients. 52.7% women had major degree of PP and remaining 47.3% had minor degree of PP. Most deliveries (70.9%) were elective C-sections, with 25.5% being emergency C-sections and only 3.6% spontaneous vaginal deliveries. Major PP cases were associated with a higher incidence of surgical complications, including hemorrhage (7.3%), cesarean hysterectomy (9.1%), and bladder injury (5.5%). Intraoperative transfusions were needed in 20% of major cases but none in minor cases, and ICU admissions were more frequent in the major group (10.9% vs. 1.8%). Hospital stays were longer for major placenta previa. Neonatal ICU admissions were significantly higher in major cases (18.2% vs. 1.8%, p=0.001).

**Conclusion:** As per the study conclusion, 52.7% of the women had major placenta previa, while the remaining 47.3% had minor placenta previa. Major placenta previa was associated with a higher risk of both maternal and neonatal complications compared to minor placenta previa.

**Keywords:** Placenta previa, Minor, Major, Outcomes

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## Introduction

Placenta previa (PP) is a leading cause of vaginal bleeding during pregnancy, typically occurring after the gestational age of 28 weeks.<sup>1</sup> In this condition, the placenta's lower edge attaches to the lower segment of the uterus, either covering or reaching the internal cervical os, with the placenta positioned below the presenting part of the fetus.<sup>1,2</sup> It is linked to a heightened risk of complications, including increased bleeding, the need for blood transfusions,

postpartum anemia, septicemia, hysterectomy, thrombophlebitis, and even maternal mortality.<sup>3</sup> PP makes a safe vaginal delivery impossible, necessitating cesarean delivery for the neonate.<sup>4</sup> While many cases are diagnosed early in pregnancy through ultrasound, others may present in the second or third trimester with painless vaginal bleeding.

Additionally, PP increases the risk of developing placenta accreta spectrum.<sup>4</sup> The exact cause of PP

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remains unclear, but there seems to be a connection between endometrial damage and uterine scarring, which are significant and common factors contributing to the development of PP. The two most significant risk factors are a history of PP and prior cesarean section (CS) and the prevalence increases with the rising number of cesarean deliveries, reaching approximately 0.5%.<sup>5,6</sup> Other contributing risk factors include increased age of women, chronic hypertension, multi-parity, previous uterine procedures such as curettage and myomectomy, smoking habits and multiple gestations.<sup>5,7</sup>

The complications of placenta previa extend beyond the antepartum period, affecting the intra-partum and postpartum phases as well. These complications can include a high rate of cesarean deliveries, morbidly adherent placenta, peri-partum hysterectomy and postpartum hemorrhage.<sup>8,9</sup> The presence of placenta previa (PP) elevates the risk of maternal hemorrhage in late pregnancy, during labor, and after delivery. In severe cases, this condition can result in hemodynamic instability, decreased oxygen supply, and organ damage, leading to emergency surgery and the need for extensive blood transfusions.<sup>10</sup> It can also trigger serious complications like disseminated intravascular coagulation and multiple organ dysfunction syndrome, both of which are major contributors to maternal mortality.<sup>10-12</sup> Newborns of mothers with placenta previa are at a higher risk of experiencing preterm birth, perinatal death, congenital abnormalities, and low Apgar scores at both 1 and 5 minutes, typically below 7.<sup>13,14</sup> Studies on perinatal morbidity show that many of these infants require resuscitation and admission to the neonatal intensive care unit (NICU). Additionally, the most significant outcomes of this condition include being small for gestational age and having a low birth weight.<sup>13,15</sup> Historically, placenta previa has been categorized into different types: complete, partial, and marginal. Identifying the clinical risk factors associated with PP is crucial in predicting cases of severe hemorrhage, which can significantly help in improving both maternal and fetal outcomes. This study holds important implications for clinical practice and patient outcomes. Examining the various types of PP and their relationship with maternal and fetal consequences is important for advancing understanding of the condition, enhancing obstetric care strategies, and improving health outcomes for both mothers and their newborns.

## Methodology

A descriptive cross-sectional study was done at department of Obstetrics & Gynecology of Federal Government Polyclinic Islamabad After taking approval from the hospital's Ethical Committee. Study duration was one year from 1st Jan., 2023 to 31st December 2023. Non probability consecutive sampling technique was used. All the pregnant women visiting antenatal OPD with low lying placenta on ultrasound in third trimester, women coming to labour room or emergency with Antepartum hemorrhage and having low lying placenta on ultrasound and those who were referred to obstetric department by any clinic or hospital of either age of women and parity were included.

Women with low lying placenta on ultrasound in first and second trimester, pregnant women presenting with vaginal bleeding in first and second trimester, presenting with vaginal bleeding in third trimester but with normal location of placenta and those who were not willing to participate in the study were excluded. Before the study was conducted, written informed consent was obtained from all participating women. They were fully informed about the research's nature and assured of the confidentiality of their data. Information such as age, gestational age, educational background, occupation, place of residence, whether they were booked or referral cases, previous obstetric history, and the type of placenta determined by ultrasound or MRI was documented. The types of placenta previa were categorized bases on imaging findings from either ultrasound or MRI, specifically focusing on the location of the placenta in relation to the internal cervical os as; Minor or partial PP was defined as: the placenta partially covers the internal cervical os (Grade I and II) and major or complete PP was defined as the placenta covering the mouth of the cervix or completely covers the internal cervical os (grade III and IV). All the information was collected via study proforma. All the demographic data including different types of placenta previa and its association with pregnancy outcomes were analyzed using SPSS version 26.

## Results

This study involved 55 patients, with 89.1% aged over 25 years. Most of the women were in gestational age below 25 weeks (58.2%), while 40% were between 25-35 weeks. According to educational status, 34.5%

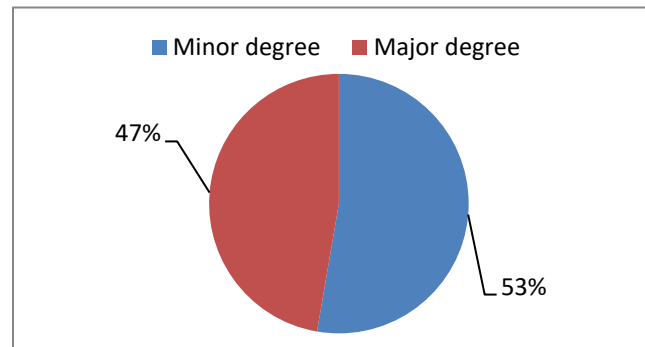
had completed matriculation, 30.9% were uneducated, and 20% had education above matric. The majority of women (65.5%) were admitted through the outpatient department, and 94.5% were booked patients. In terms of history of previous delivery, 43.6% had previous C-sections, while 41.8% had spontaneous vaginal deliveries (SVD). Most of the women (74.5%) had 1 to 3 previous pregnancies, and 40% had a history of antenatal bleeding. Regarding surgical scars, 52.7% had no scars and 18.2% had one scar, followed by 14.5% had three, and 7.3% had either two or four previous scars as shown in table I.

**Table I: Demographic and clinical characteristics of the patients. (n=55)**

Variables	N	%
Age groups	< 25	06 10.9
	> 25	49 89.1
	Total	55 100.0
Gestational age	< 36 weeks	22 40.0
	≥ 36 weeks	33 60.0
	Total	55 100.0
Educational status	Uneducated	17 30.9
	Below matric	08 14.5
	Matric	19 34.5
	Above matric	11 20.0
	Total	55 100.0
Admitted through	OPD	36 65.5
	ER	19 34.5
	Total	55 100.0
Booking status	Booked	52 94.5
	Un-booked	3 5.5
	Total	55 100.0
Previous mode of delivery	No	06 10.9
	SVD	23 41.8
	C-section	24 43.6
	SVD + C-section	02 03.6
	Total	55 100.0
Parity	Nulliparous	6 10.9
	Parity 1-3	41 74.5
	Parity 4-6	08 14.5
	Total	06 10.9
History of Antenatal bleeding	Yes	22 40.0
	No	33 60.0
	Total	55 100.0
Previous scar	No scar	29 52.7
	Previous 1 scar	10 18.2
	Previous 2 scars	04 07.3
	Previous 3 scars	08 14.5
	Previous 4 scars	04 07.3
	Total	55 100.0

According to the frequency of degree of the placenta previa, 52.7% women had major degree of placenta previa and remaining 47.3% had minor degree of PP as shown in figure 1. According to the pregnancy outcomes based on degree of placenta previa (minor vs. major) in 55 patients, the most

deliveries (70.9%) were done by elective C-section, with emergency C-sections 25.5%, and only 3.6% were spontaneous vaginal deliveries. Surgical complications were more common in major placenta previa cases, with a significant increase in hemorrhage (7.3%), cesarean hysterectomy (9.1%), and bladder injury (5.5%) compared to minor cases ( $p=0.001$ ).



**Figure 1. Degree of placenta previa. (n=55)**

Intraoperative transfusion was required in 20% of major cases, but none in minor cases ( $p=0.001$ ). Post-operative transfusion occurred in 5.5% of major cases ( $p=0.060$ ). Surgical ICU admissions were more frequent in major placenta previa (10.9% vs. 1.8%,  $p=0.029$ ), and patients with major placenta previa had longer hospital stays, with 20% staying more than 3 weeks ( $p=0.086$ ). Maternal mortality was low, with only one death (1.8%) occurring in the major placenta previa group ( $p=0.286$ ). Neonatal ICU admissions were significantly higher in major placenta previa cases (18.2% vs. 1.8%,  $p=0.001$ ). Table II

## Discussion

Placenta previa is a serious pregnancy complication and a leading cause of postpartum hemorrhage, posing significant risks to the lives of pregnant women. In recent years, growing research suggests that the location of the placenta previa plays a crucial role in determining pregnancy outcomes.<sup>16</sup> This study has been done to determine the frequency of different types of placenta previa and its association with pregnancy outcomes, on 55 women presenting with placenta previa with majority of women 89.1% aged over 25 years, with most of the women (60.0%) had gestational age at the time of was 36 weeks, while 40.0% had gestational age less than 36 weeks. The majority of women (65.5%) were admitted through the outpatient department, and 94.5% were booked women. In aligns to this study Maqsd M et al<sup>17</sup>

**Table II: Pregnancy outcomes according to degree of placenta previa. (n=55)**

Variables	Types of placenta previa		Total	P-value
	Minor degree	Major degree		
<b>Mode of delivery</b>				
SVD	02(3.6%)	0(0.0%)	02(3.6%)	0.393
Elective C-section	20(36.4%)	19(34.5%)	39(70.9%)	
Emergency C-section	07(12.7%)	07(12.7%)	14(25.5%)	
<b>Surgical complication</b>				
No	29(52.7%)	14(25.5%)	43(78.2%)	0.001
Hemorrhage	0(0.0%)	4(7.3%)	4(7.3%)	
Cesarean hysterectomy	0(0.0%)	5(9.1%)	5(9.1%)	
Bladder injury + cesarean hysterectomy	0(0.0%)	3(5.5%)	3(5.5%)	
Yes	0(0.0%)	11(20.0%)	11(20.0%)	
<b>Intra operative transfusion</b>				
No	29(52.7%)	15(27.3%)	44(80.0%)	0.001
Yes	0(0.0%)	11(20.0%)	11(20.0%)	
<b>Post-operative transfusion</b>				
No	29(52.7%)	23(41.8%)	52(94.5%)	0.060
Yes	0(0.0%)	3(5.5%)	3(5.5%)	
<b>Surgical ICU admission</b>				
No	28(50.9%)	20(36.4%)	48(87.3%)	0.029
Yes	1(1.8%)	6(10.9%)	7(12.7%)	
<b>Duration of hospital stay</b>				
Less than 1 weeks	15(27.3%)	3(5.5%)	18(32.7%)	0.086
1 to 2 weeks	7(12.7%)	8(14.5%)	15(27.3%)	
2 to 3 weeks	7(12.7%)	4(7.3%)	11(20.0%)	
More than 3 weeks	0(0.0%)	11(20.0%)	11(20.0%)	
Yes	0(0.0%)	1(1.8%)	1(1.8%)	
<b>Maternal mortality</b>				
No	29(52.7%)	25(45.5%)	54(98.2%)	0.286
Yes	0(0.0%)	1(1.8%)	1(1.8%)	
<b>Neonatal ICU admission</b>				
No	28(50.9%)	16(29.1%)	44(80.0%)	0.001
Yes	1(1.8%)	10(18.2%)	11(20.0%)	

reported that the mean of women with placenta previa was 28.59+4.45 years and mean gestational age was 35.53+5.80 weeks. In another study by Wasim T et al<sup>18</sup> reported that the 6.07% of patients were aged between 31 and 40 years, while 52.08% of those with placenta previa were under 30 years old and in their study in both groups, the gestational age exceeded 34 weeks, with 73.2% and 65.2% respectively and in their study (86.1%) patients were booked.<sup>18</sup> Inconsistently Kumari U et al<sup>19</sup> reported that the majority of cases were unregistered, came from rural areas, and were from lower socioeconomic backgrounds.

Furthermore in this study, 43.6% had previous C-sections, while 41.8% had spontaneous vaginal deliveries (SVD), particularly, 52.7% had no scars and 18.2% had one scar, followed by 14.5% had three, and 7.3% had either two or four previous scars. In the comparison of this study Maqsd M et al<sup>17</sup> reported that thirty percent of the women had a prior history of spontaneous vaginal delivery, 15.8%

primiparous and the rest had undergone 1 to 4 previous cesarean sections. In the study by Wasim T et al<sup>18</sup> reported that 24 women had no prior cesarean sections, while the rest had a history of undergoing the procedures with a higher number of cesarean sections and the presence of anterior placenta previa were significantly linked to an increased risk of Morbidly Adherent Placenta.

In this study according to the frequency of degree of the placenta previa, 52.7% women had major degree of placenta previa and remaining 47.3% had minor degree of placenta previa. In the comparison of our findings Bahar A et al<sup>20</sup> reported that major placenta previa (complete or partial) was observed in 173(56.5%) of cases, while minor placenta previa (marginal or low-lying placenta) occurred in 133 (43.5%) women. Our findings were also correlated with study by Maqsd M et al<sup>17</sup> as the majority of patients (41.7%) were diagnosed with grade IV placenta previa, followed by 25.8% with grade II, 20.8% with grade III, and 11.7% with grade I placenta previa, while Grönvall M et al<sup>21</sup> reported that the a total of 176 women were diagnosed with placenta previa at the time of delivery, with 129 cases classified as major placenta previa and 47 as minor placenta previa. In the study by Zheng X et al<sup>22</sup> demonstrated that the out of 80 women, there were 23 cases of complete placenta previa (28.8%), 30 cases of partial placenta previa (37.5%), and 27 cases of marginal placenta previa (33.8%). There is some variation in the frequency of different types of placenta previa when compared to other studies. This discrepancy may be attributed to several factors, including differences in sample sizes, the criteria used for sample selection, and the classification methods for placenta previa.

In this study, the majority of deliveries (70.9%) were conducted via elective cesarean section, while 25.5% were emergency cesareans, and only 3.6% were SVD. Surgical complications were more common in cases of major placenta previa, with increased rates of hemorrhage (7.3%), cesarean hysterectomy (9.1%), and bladder injury (5.5%) compared to minor cases (p=0.001). Intraoperative transfusions were required in 20% of major cases, whereas none were necessary in minor cases (p=0.001). Additionally, post-operative transfusions were needed in 5.5% of major cases (p=0.060). Patients with major placenta previa also had higher rates of surgical ICU admissions (10.9% vs. 1.8%, p=0.029) and longer hospital stays, with 20% staying more than three weeks (p=0.086). Maternal

mortality was low, with only one death (1.8%) recorded in the major placenta previa group ( $p=0.286$ ), and neonatal ICU admissions were significantly higher in major cases (18.2% vs. 1.8%,  $p=0.001$ ). These findings are consistent with studies by Bahar A et al,<sup>20</sup> Grönvall M et al<sup>21</sup>, and Kumari U et al<sup>19</sup>. Findings of the study indicated that the frequency major degree of placenta previa is rising and associated with increased risks of adverse pregnancy outcomes. Women with major placenta previa face more complications, highlighting the importance of monitoring and managing these cases. However, the study has several limitations, including a limited sample size and being conducted at a single center, which restricts the generalizability of the results.

Therefore, these findings should not be considered definitive. Further extensive research is recommended to validate these results and provide a more comprehensive understanding of the implications of major placenta previa on pregnancy outcomes.

## Conclusion

Study revealed the 52.7% of the women had major placenta previa, while the remaining 47.3% had minor placenta previa. The majority of cases involved elective cesarean sections. Significant complications, including hemorrhage, cesarean hysterectomy, and bladder injuries, were more prevalent in women with major placenta previa. These patients also had a higher likelihood of requiring intraoperative blood transfusions, longer hospital stays, and ICU admissions. Neonatal outcomes were similarly affected, with increased rates of NICU admissions in cases of major placenta previa. It is importance of early detection, careful monitoring, and tailored management strategies to prevent the adverse pregnancy outcomes associated with placenta previa. Further relevant large scale studies are needed to validate the findings.

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