

# Foeto-Maternal Outcome in Women with Placenta Praevia and Morbidly Adherent Placenta Praevia

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## Author's Contribution

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## ABSTRACT

**Objective:** To determine the maternal and foetal outcome in pregnant women with placenta praevia and morbidly adherent placenta praevia

**Methodology:** A prospective case series was carried out in a tertiary care institution between 2019 and 2021. All pregnant women with placenta praevia and placenta accreta spectrum who were over 28 weeks gestation were included, regardless of whether they received their diagnoses during pregnancy or during surgery. Data was collected on structured proforma regarding demographic characteristics, obstetric factors, management options, and intraoperative complications to determine foeto-maternal outcome in women with placenta praevia and morbidly adherent placenta praevia.

**Results:** Total number of patients with placenta praevia was 140; out of which 31 (22.1%) had placenta accreta spectrum. All cases of morbid adherence were found in major degree placenta praevia ( $p=0.00$ ). Antepartum haemorrhage in current pregnancy was more associated with placenta praevia as compared to morbidly adherent placenta praevia ( $p=0.00$ ). Both placenta praevia with and without morbid adherence led to preterm birth ( $p=0.00$ ). LSCS as mode of delivery in previous pregnancy, step-wise-devascularization, caesarean hysterectomies, bladder injury, blood loss more than 1000ml, number of blood transfusions, and mothers required ICU care were significantly associated ( $p\leq 0.05$ ) with morbidly adherent placenta praevia as compare to placenta praevia without morbid adherence. In cases of placenta accreta spectrum; 11(33.3%) babies were admitted in NICU as compare to 29(25.9%) in placenta praevia without placenta accreta spectrum.

**Conclusion:** Placenta praevia is adversely affected by placenta accreta spectrum is associated with higher foeto-maternal morbidity as compared to placenta praevia without adherence.

**Keywords:** Antepartum, placenta accreta spectrum, placenta praevia, morbidly adherent placenta, postpartum haemorrhage.

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## Introduction

Placenta praevia occurs due to abnormal implantation of the placenta in the lower uterine segment. It may cover the internal os partially or completely and is divided into four types. In type one and two, the placenta partially covers the internal os, also known as minor degree placenta praevia. In type III and IV which is known as major degree praevia, placenta completely covers the internal os.<sup>1</sup> The prevalence of placenta praevia ranges from 0.2% to 0.5% overall. However, up to 3.5% of placenta praevia cases in Pakistan have been reported.<sup>3</sup>

Normal placentation occurs from the adherence of blastocyst to the decidualized endometrium, while abnormal invasion into the myometrium results in placenta accreta spectrum. Based on histopathology, the severity of aberrant placentation is divided into three levels. The most common and least severe is placenta accreta, in which placental villi reach up to the surface of the myometrium. Invasion of placental villi into the myometrium results in placenta increta. In placenta percreta, placental villi penetrate beyond the myometrium into the uterine serosa and other pelvic organs like the

urinary bladder, etc.<sup>4</sup> The incidence of placenta accreta ranges from 1/300 to 1/2000 pregnancies.<sup>1</sup>

Placenta praevia, also known as placenta accreta spectrum, is an obstetric risk factor linked to antepartum, intrapartum, and postpartum hemorrhage. It is one of the leading causes of obstetric hysterectomy. The incidence of placenta praevia and placenta accreta spectrum is believed to have increased globally, and the rising caesarean section rate is one of the major contributing factors.<sup>5,6</sup> It has important clinical implications that can result in high maternal and foetal morbidity and mortality. Intra-partum and post-partum haemorrhage is a leading cause of maternal morbidity and mortality in developing countries. It may lead to antepartum haemorrhage, postpartum haemorrhage, disseminated intravascular coagulation (DIC), multi-organ failure, ICU admission, and prolong hospital stay. Management of haemorrhage may require massive blood transfusion, stepwise devascularisation, obstetric hysterectomy, ICU care and prolonged hospital stay.<sup>7</sup> Small for gestational age foetus, preterm births, and their consequences such as Respiratory Distress Syndrome (RDS), Intra-Ventricular Haemorrhage (IVH), Necrotizing Entero-Colitis (NEC), sepsis, jaundice, and neonatal ICU admission all contribute to foetal morbidity and mortality.<sup>8,9</sup>

With better recognition of risk factors and radiologic aid, many cases of abnormal placentation are diagnosed during the antenatal period.<sup>10</sup> However, in developing countries like Pakistan, all patients don't have access to health care facilities and many patients present in emergency with complication of placenta praevia and or placenta accrete spectrum, leading to high foeto-maternal morbidity and mortality. This study was conducted to determine the foeto-maternal outcome in women with placenta praevia without adherence and morbidly adherent placenta praevia. It is reported in literature that morbidly adherent placenta is associated with maternal morbidity in up to 60% of patients and maternal mortality in up to 7% of cases of placenta accreta.<sup>10,11</sup> This study would help to identify the gravity of the morbidity related to abnormally located and morbidly adherent placenta in our pregnant women.

## Methodology

This prospective case series was conducted in a tertiary care hospital after ethical approval. The number of ethical approval letter is SMDC/SMRC/92-19. The duration of study was three years, from 2019 to 2021. All pregnant women at more than 28 weeks of gestation with placenta

praevia and morbidly adherent placenta praevia, whether diagnosed during the antenatal period or intraoperatively, were included. All women with fundal placenta, gestational age of less than 28 weeks, foetus with intrauterine foetal growth restriction, and anomalies were excluded. Moreover, pregnancies with co-morbidities like uncontrolled diabetes, hypertension, and cardiac diseases were also excluded.

A sample size of 140 was calculated using the statistical program "WinPepi" with confidence level 95%, and acceptable difference of 0.08 at assumed proportion of 0.35. The sampling technique is non-probability consecutive sampling. An informed consent was obtained from all the patients who fulfilled the inclusion criteria. Data was collected on a structured proforma that includes demographic characteristics like age, parity and gestational age of study participants. Obstetric risk factors like previous mode of delivery, number of previous caesarean sections, past history of uterine curettage, myomectomy, placenta praevia or adherent placenta, and multiple pregnancies were inquired. Maternal morbidity like antepartum haemorrhage, no. of blood transfusions, caesarean hysterectomy, DIC, multi-organ failure, damage to bladder, ureter or bowel, need of ICU care, and maternal death were recorded. Fetal outcome like foetal gestational age, foetal weight, APGAR score, Respiratory Distress Syndrome (RDS), jaundice neonatorum (JNN), and NICU admission were documented.

SPSS version 23 was used to enter and analyse all of the data. The mean and standard deviation were used to calculate quantitative variables such as age, gravidity, and gestational age. For qualitative variables like age groups, parity groups, previous mode of delivery, past history of uterine curettage, myomectomy, antepartum haemorrhage, blood loss, blood transfusions, maternal ICU care and maternal mortality, percentages were calculated. Similarly, foetal gestational age and foetal weight were calculated using mean and standard deviation while foetal prematurity, RDS, JNN were calculated in percentage. Test of significance applied for qualitative data was Chi square and P value of  $\leq 0.5$  was taken as statistically significant.

## Results

The total number of patients with placenta praevia was 140, out of which 31 (22.1%) had morbidly adherent placenta praevia. All cases of morbid adherence had a

major degree of placenta praevia, with placenta accrete in 19 (61.129%), increta in 6 (19.35%), and percreta in 6 (19.35%). Placenta praevia without morbid adherence were minor degree in 50 (45.87%) cases and major degree in 59(54.12%) cases. The mean age in women with placenta praevia was 30.30±4.32 ranging from 22-38 years versus 30.61±4.07 ranging from 24-38 years in women with morbidly adherent placenta praevia. Mean

gravidity 4.17±2.8 ranging from 1 to 15 versus 4.06±1.54 ranging from 1-7 in placenta praevia versus placenta praevia with morbid adherence.

In women with placenta praevia, the mode of delivery was SVD in 10 (9.17%) elective caesarean section in 70(64.22%), and emergency caesarean in 29 (26.60%). Elective caesarean section was carried out in 25(80.6%)

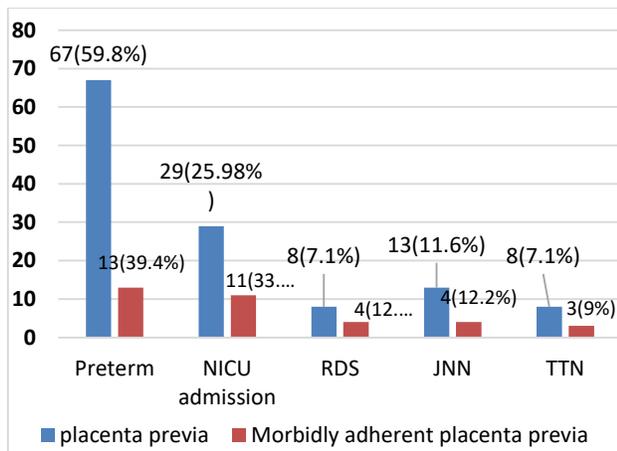
**Table I: Demographic and obstetric factors in women with placenta praevia and morbidly adherent placenta praevia**

Variables		Placenta Praevia N (%)	Morbidly adherent placenta praevia N (%)	Chi <sup>2</sup> P value	
Age (years)	20-25	21(19.26%)	05(16.13%)	0.04	
	26-30	37(33.94%)	12(38.71%)		
	31-35	42(38.53%)	11(35.48)		
	35-40	09(8.25%)	03(9.68)		
Gravidity	Primigravida	03(2.75%)	01(03.23)	0.74	
	Gravida 2	33(30.27%)	08(25.80)		
	Multigravida	53(48.62%)	17(54.84)		
	Grand multigravida	27(24.77%)	04(12.90)		
	Great grand multigravida	06(5.50%)	01(03.23)		
Gestational age (Weeks)	<37	64(58.71%)	10(32.26)	0.00	
	≥37	45(41.28%)	21(67.74)		
Previous mode of delivery	LSCS	65(59.63%)	26(83.87)	0.00	
	SVD	32(29.35%)	01(03.23)		
	Both	09(8.25%)	03(9.68)		
Interpregnancy interval (Years)	1	41(37.61%)	20(64.51)	0.01	
	Yes 2	48(44.03%)	09(29.03)		
	3	17(15.59%)	01(03.23)		
	No (Primigravida)	03(2.75%)	01(03.23)		
Multiple Pregnancy	Yes	03(2.75%)	02(6.45)	0.32	
	No	106(97.25%)	29(93.55)		
Previous history of uterine curettage	Yes	16(14.68%)	04(12.90)	0.80	
	No	93(85.32%)	27(87.10)		
Previous myomectomy	Yes	04(3.67%)	02(6.45)	0.49	
	No	105(96.34%)	29(93.55)		
Past History of placenta praevia	Yes	05(4.59%)	03(9.68)	0.28	
	No	104(95.41%)	28(90.32)		
APH in current pregnancy	Yes	85(77.98%)	05(16.13)	0.00	
	No	24(22.02%)	26(83.87)		
Type of praevia	Major	59(54.13%)	30(96.77)	0.00	
	Minor	50(45.87%)	01(3.23)		
Haemostatic sutures and Stepwise devascularization	Yes	Haemostatic sutures	43(39.45%)	09(29.03)	0.00
		Uterine artery Ligation	17(15.60%)	11(35.48)	
		Internal Iliac ligation	01(0.91%)	03(09.68)	
	No	48(44.03%)	08(25.81)		
Caesarean hysterectomy	Yes	10(9.17%)	16(51.61)	0.00	
	No	99(90.83%)	15(48.39)		
Visceral injury	Yes	01(0.97%)	01(3.23)	0.00	
	No	108(99.10%)	30(96.77)		
Blood loss	≤1000	70(64.22%)	02(6.45)	0.00	
	>1000	39(35.78%)	29(93.55)		
Number of blood transfusions	Yes	1-3	64(58.72%)	18(58.06)	0.00
		≥4	12(11.00%)	13(41.94)	
	No	33(30.28%)	--		
Number of FFPs	Yes	16(14.68%)	13(41.94)	0.00	
	No	93(85.32%)	18(58.06)		
Maternal ICU care	Yes	07(6.42%)	06(19.35)	0.02	
	No	102(93.58%)	25(80.65)		

**Table II: Foetal outcome in women with placenta praevia and morbidly adherent placenta.**

Foetal variables	Mean± SD	Mean± SD	P value
Mean gestational age	35.08±2.34	36.45±1.02	<b>0.00</b>
Mean baby weight	2.52± 0.66	2.81± 0.37	<b>0.02</b>
Mean APGAR at birth	5.98±2.55	6.77±1.20	0.09
Mean APGAR at 1 minute	7.88 ±2.92	8.67±0.79	0.13

and emergency caesarean section in 6 (19.4%) women with morbidly adherent placenta praevia. All the mothers were discharged home. Table I shows the comparison of demographic characteristics, obstetric factors, management options, and intraoperative complications in both groups.



**Figure 1. Foetal outcome in placenta praevia versus morbidly adherent placenta praevia.**

## Discussion

Placenta praevia as well as morbidly adherent placenta is associated with foeto-maternal morbidity. Placenta praevia is associated with morbid adherence in the form of placenta accreta, increta, or percreta. According to this study, 31 (22.1%) of women had placenta accrete spectrum. A study conducted in Saudi Arabia; identified 11(11.45%) cases of morbidly adherent placenta.<sup>12</sup>

Placenta praevia and morbidly adherent placenta was seen more in age group of 26–35 years. Demographic and obstetric characteristics like gravidity, multiple pregnancies, past history of uterine curettage, myomectomy, and placenta praevia was not significantly associated with placenta praevia and morbidly adherent placenta praevia. In contrast, a study conducted in Australia and New Zealand to evaluate the factors associated with placenta accrete found a significant association with multiparity, multiple pregnancy, and assisted conception, i.e.,  $p = 0.001$ ,  $<0.05$ , and  $p < 0.01$  respectively.<sup>8</sup>

Regarding obstetric risk factors, gestational age 37 weeks was significantly related to both groups of placenta praevia with and without morbid adherence ( $p=0.00$ ). LSCS as mode of delivery in previous pregnancy is also an obstetric risk factor that is associated with placenta praevia with and without morbid adherence. The lower the inter-pregnancy interval, the higher is the chances of placenta praevia as well as adherent placenta praevia ( $p=0.00$ ). A study conducted in Japan revealed that cases of morbidly adherent placenta praevia are more in women with previous caesarean delivery.<sup>13</sup> According to Wasim et al, higher order caesarean sections are associated with morbidly adherent placenta.<sup>14</sup>

All cases of morbid adherence were found in major degree placenta praevia ( $p= 0.00$ ). Placenta praevia is associated with more antepartum haemorrhage in current pregnancy than morbidly adherent placenta praevia ( $p = 0.00$ ). Morbidly adherent placentas had a significantly higher risk of postpartum hemorrhage, blood transfusions, caesarean hysterectomy, and intensive care unit (ICU) admission compared to patients with placenta praevia ( $p = 0.0001$ ).<sup>14</sup> Antepartum haemorrhage was the clinical presentation in 85(77.98%) women with placenta praevia versus 6(16.13%) cases of morbidly adherent placenta praevia. Similarly, a study by Radwan et al revealed that 96(76.8%) cases of placenta praevia without morbid adherence had antepartum haemorrhage while 8.8% of women with morbidly adherent placenta had haemorrhage during antenatal period.<sup>12</sup>

Regarding the management aspects; step-wise-devascularization was required in a greater number of cases of morbidly adherent placenta praevia while in placenta praevia haemostatic static sutures followed by stepwise devascularization was the sequence ( $p=0.00$ ) to control intraoperative haemorrhage. More caesarean hysterectomies were done to manage morbidly adherent placenta including placenta accrete, increta and percreta as compare to placenta praevia without morbid adherence ( $p=0.00$ ). Higher percentage of bladder injury was associated with morbidly adherent placenta praevia in contrast to placenta praevia without adherence ( $p=0.00$ ). Blood loss more than 1000ml was found in greater number of cases of morbidly adherent placenta ( $p=0.00$ ). Similarly, number of blood transfusions and FFPs

transfusion were higher in cases of placenta praevia with morbid adherence. More mothers required ICU care in cases of morbidly adherent placenta praevia as compare to placenta praevia without adherence ( $p=0.02$ )

Peripartum hysterectomies, surgical complications, ICU admission in women with placenta praevia with adherence are significantly higher as compare to women without adherent placenta praevia i.e.  $P=0.009$ ,  $P=0.008$ , and  $P=0.00$  respectively.<sup>12</sup> Study conducted by Farquhar et al revealed that admissions to ICU and caesarean hysterectomy was significantly associated with placenta accrete as compare to control group ( $p<0.001$ ).<sup>8</sup> According to Fujisaki et al, risk of hysterectomy, bladder injury, blood loss more than 1000ml, and blood transfusion is significantly higher in women diagnosed with morbidly adherent placenta on ultrasonography.<sup>13</sup> In morbidly adherent placenta; peripartum hysterectomy was carried out in 60%(6), ICU transfer in 80% (8), prolong hospital stay (> than 7 days) in 90% (9), blood transfusion in 80%(8), FFP transfusion in 50%(5), bladder injury in 10%(1) , internal iliac artery ligation in 10% (1) , and maternal mortality in 10%(1) cases.<sup>15</sup>

Regarding foetal outcome mean gestational age  $35.08\pm 2.34$  versus  $36.45\pm 1.02$ , and mean baby weight  $2.52\pm 0.66$  versus  $2.81\pm 0.37$ . It was less in cases of placenta praevia versus morbidly adherent placenta praevia ( $p=0.00$ ). The frequency of NICU admission is higher in babies born to mothers with morbidly adherent placenta praevia, but there is no significant difference in APGAR score of two groups. A study by Fujisaki et al revealed a mean gestational age of  $34.1 \pm 4.1$ .<sup>13</sup> Wasim et al. discovered that the majority of babies were born with a birth weight of 2.5 kg (73.3% and 72.9%, respectively), and the majority of them, 78.5% and 76.16%, had a good APGAR score in both groups ( $p=0.657$ ).<sup>14</sup> Moreover, neonatal admission was 14.2% versus 11.45% in patients with morbidly adherent placenta praevia versus placenta praevia without adherence.<sup>14</sup> According to Kunte et al, 29.42% babies with placenta praevia were transferred to NICU.<sup>16</sup>

Different management options were evaluated in a retrospective record-based study. It showed that patients with a morbidly adherent placenta who were managed with bilateral uterine artery ligation and suturing the cervix with lower uterine segment has better outcome in terms of blood loss, no. of blood transfusions, and hospital stay as compared to balloon tamponed alone and

or combined with uterine artery ligation.<sup>17</sup> Use of radiologic aid for placental localization and to rule out placental adherence at 18-24 weeks of gestation, especially in patients with obstetric risk factors, is crucial. Early admission, prophylactic corticosteroids, and planned surgery around 36-37 weeks with a multidisciplinary approach in order to utilize maximum available resources, and expertise for better foeto-maternal outcome.<sup>10</sup>

It is a single centered prospective case series with ample sample size that determines the maternal and foetal outcome in women with placenta praevia versus morbidly adherent placenta praevia.

## Conclusion

The frequency of placenta accreta spectrum is quite high in patients with placenta praevia. All cases of placenta accreta spectrum were found in major degree placenta praevia. Antepartum haemorrhage in the current pregnancy is more associated with placenta praevia as compared to morbidly adherent placenta praevia. Both groups of placenta praevia with and without morbid adherence lead to preterm birth. LSCS as mode of delivery in previous pregnancy, step-wise-devascularization, caesarean hysterectomies, bladder injury, blood loss more than 1000ml, number of blood transfusions, and mothers required ICU care are significantly associated in adherent placenta praevia as compared to placenta praevia. It shows the gravity of the situation associated with placenta praevia especially with placenta accreta spectrum

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