

# Maternal And Fetal Outcome in Placenta Previa: A Multicenter Prospective Observational Study

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## Abstract

**Objective:** To find out the frequency of placenta previa and maternal and fetal outcomes in cases of placenta previa in our population.

**Methods:** All women with an age range from 18-40 years diagnosed with placenta previa based on ultrasound were recruited with the study. Data including patient age, parity, previous normal deliveries, previous caesarian sections, grade of the placenta previa and history of previous pregnancies was recorded. Maternal complications including post-partum haemorrhage, hysterectomy and death were also recorded. Fetal complications including low APGAR score at five minutes, low birth weight and death were also recorded.

**Results:** The age group between 26-35 years seems to have the highest incidence of placenta previa (62.58%). Post-partum haemorrhage was seen in 57 (38.77%) patients. Post-partum haemorrhage was strongly associated with the grade of placenta previa. Emergency obstetric hysterectomy was done in 7 (4.76%) patients. Two (1.36%) patients died of complications. Out of 147, 38 (25.85%) had low APGAR scores, 52 (35.37%) had low birth weight and 12 (8.16%) died of various complications.

**Conclusion:** Placenta previa has become a very common condition which may be attributable to higher rates of caesarians. It may lead to increased morbidity and mortality of the mother and the baby if not diagnosed and managed properly. These cases should be managed by experienced multidisciplinary teams in a tertiary care centre to minimize the rate of complications.

**Keywords:** APGAR score, Intrauterine growth retardation, Neonatal, Placenta previa, Postpartum haemorrhage.

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## 1. Introduction

Placenta previa is a pathological condition in which the placenta is implanted near the internal os of the cervix resulting in either partial or complete obstruction of internal os.<sup>1</sup> It usually presents as painless vaginal bleeding.<sup>2</sup> This bleeding occurs in the third trimester of pregnancy. Bleeding occurs due to thinning out of the lower uterine segment in preparation for labour.<sup>3</sup> Bleeding may occur once labour is induced. This happens due to dilatation of the cervix and the lower uterine segment does not sufficiently contract hence cannot constrict the uterine vessels leading to excessive bleeding.

Its prevalence worldwide is approximately four per 1000 pregnancies.<sup>4</sup> Risk increases to 1.5 to 5% after caesarian section.<sup>5</sup> Other risk factors include maternal age greater than 35 years, multiparity, women on infertility treatment, multiple gestations, short intervals between the pregnancies, previous uterine surgeries or injuries, recurrent abortions, low socioeconomic status, drug addiction and smoking.<sup>6</sup>

Complications of placenta previa can be divided into maternal and fetal/neonatal complications. Maternal complications include peripartum bleeding, blood transfusion, septicemia thrombophlebitis, endometritis and death.<sup>7-8</sup> Fetal and neonatal complications include respiratory distress syndrome, preterm birth, congenital anomalies, low birth weight, low APGAR score and perinatal death.<sup>8</sup> Studies have also demonstrated that pregnancies with placenta previa are associated with an increased risk of surgical complications including hysterectomy, injury to nearby organs, massive transfusions, and disseminated intravascular coagulation.<sup>9</sup>

Management of placenta previa includes decreased physical activity to avoid bleeding and re-bleeding, avoidance of intercourse and maintaining folic acid and iron intake during the pregnancy. During the caesarian section, massive bleeding should be anticipated and all necessary arrangements including the availability of an experienced obstetric and anaesthesia team, and blood products.

Placenta previa is quite a common condition and carries grave complications not only for the mother but also for the fetus. Timely diagnosis and

management are of utmost importance to avoid these complications. Unfortunately, this is a very challenging task in a developing country like Pakistan where most of the population is deprived of experienced and qualified medical service providers and facilities. We aimed to carry out this multicenter study to find out the frequency of placenta previa and maternal and fetal outcomes in our population. Very few studies have been done on this subject.

## 2. Materials & Methods

This was a multicenter prospective observational study carried out at Combined Military Hospital Quetta and Combined Military Hospital Quetta from 1<sup>st</sup> Aug 2021 till 30<sup>th</sup> January 2023. Prior approval from the Institutional Ethical Review Board (Certificate No: CMH QTA-IERB/04/2023) was taken from both institutes before the commencement of the research project. Written informed consent was signed by each eligible patient before recruitment for the study. All women with an age range from 18 to 40 years diagnosed with placenta previa based on ultrasound were recruited with the study. The grade of the placenta previa was determined with the help of transvaginal ultrasonography performed at 28 weeks. Grades of placenta previa are described in table 1 below.

**Table 1: Grades of Placenta Previa**

Grade	Features
<b>Grade I: Low Lying</b>	The placenta is attached to the lower uterine segment but not abutting the internal os.
<b>Grade II: Marginal</b>	The placenta reaches the margin of the internal os but does not cover it.
<b>Grade III: Partial</b>	The placenta partially covers the internal os.
<b>Grade IV: Complete</b>	The placenta completely covers the internal os.

Diagnosis of the placenta previa was confirmed at the time of the caesarian section. All patients unwilling to participate in the study and those with poorly controlled chronic illnesses were excluded from this study. Data including patient age, parity, previous normal deliveries, previous caesarian sections, grade of the placenta previa and history of previous pregnancies was recorded.

Maternal complications including post-partum haemorrhage, emergency obstetric hysterectomy and death were also recorded. Fetal complications including low APGAR score at five minutes, low birth weight and death were also recorded. Data was compiled in

Statistical Package for Social Sciences version 23 for Windows. Categorical variables were presented as frequency and percentage whereas the continuous variables were presented as mean and standard deviation.

## 3. Results

A total of 6731 patients had either vaginal delivery or caesarian section in both hospitals combined. Out of these, 147 (2.18%) patients were diagnosed with placenta previa. The age range of these 147 diagnosed cases was from 19 to 40 years with a mean and standard deviation of 27.52±4.24 years. The age group between 26 to 35 years seems to have the highest incidence of placenta previa (62.58%). These 147 diagnosed cases were further divided based on the grade of placenta previa. Detailed characteristics of patients are shown in Table 2 below.

**Table 2: Patient Characteristics**

Patient Characteristics	Frequency (%)	
<b>Age in Years</b>	18-25	49 (33.33)
	26-35	92 (62.58)
	36-40	6 (4.08)
<b>Parity</b>	Nulliparous	21 (14.28)
	Primary-para	39 (26.53)
	Multi-para	79 (53.74)
<b>Grade of Placenta Previa</b>	Grade I: Low Lying	41 (27.9)
	Grade II: Marginal	45 (30.6)
	Grade III: Partial	38 (25.9)
	Grade IV: Complete	23 (15.6)
<b>Previous history of delivery</b>	Nulliparous	21 (14.28)
	Vaginal deliveries only	29 (19.72)
	Caesarian Sections only	44 (29.93)
	Vaginal Delivery and Caesarians	53 (36.05)

Post-partum haemorrhage was seen in 57 (38.77%) patients. Post-partum hemorrhage was strongly associated with the grade of placenta previa as can be seen in table 3. Emergency obstetric hysterectomy was done in 7 (4.76%) patients. Two (1.36%) patients died of complications.

**Table 3: Association of Grade of Placenta Previa and Post-Partum Hemorrhage**

Grade of Placenta Previa	Frequency of Post-partum Hemorrhage (%)
<b>Grade I: Low Lying (n= 41)</b>	6 (14.63)
<b>Grade II: Marginal (n= 45)</b>	14 (31.11)
<b>Grade III: Partial (n= 38)</b>	16 (42.11)
<b>Grade IV: Complete (n= 23)</b>	21 (91.3)
<b>Total (n=147)</b>	57 (38.77)

Fetal/neonatal outcome in placenta previa is shown in Table 4 below.

**Table 4: Fetal/neonatal outcome in placenta previa**

Outcome	Frequency (%)
Low APGAR	38 (25.85)
Low birth weight	52 (35.37)
Death	12 (8.16)

## 5. Discussion

Placenta previa is a very grave condition, which if not diagnosed and managed timely may lead to serious complications including bleeding, hypovolemia shock, coagulopathies, massive transfusions, infection, low APGAR score, intra-uterine growth restriction and even death of a mother and the child.<sup>10-11</sup> In our study we found out that the most susceptible maternal age for placenta previa is between 26-35 years with a mean of  $27.52 \pm 4.24$  years. These findings are quite consistent with various national and international studies. King L *et al.* in their study found that the mean age of patients with placenta previa is around 28.8 years.<sup>12</sup> In another study Long S *et al.* found out that patients with placenta previa have an average age of around 31 years.<sup>13</sup> In our study we found out that the majority of the patients (53.74%) diagnosed with placenta previa were multipara. Many researchers have concluded that multiparity as well as the previous history of caesarian sections is a strong risk factor for placenta previa.<sup>14-15</sup> Halimi S carried out a similar study at Saidu Teaching Hospital Swat Pakistan and found out that the overall incidence of placenta previa in primary parous was 0.41% with multiparity (parity  $\geq 4$ ) rising to 2.37%.<sup>16</sup> In our study, 38.77% of patients suffered PPH and PPH was strongly associated with the higher grades of placenta previa. In a systemic review and meta-analysis by Fan D *et al.*, it was observed that the overall incidence of PPH in cases of placenta previas was 27.4% but in cases of low-lying placenta previa (grade 1), it was 14.5%.<sup>17</sup> Hysterectomy was done in 4.76% of patients in our study. Grönvall M *et al.* in their study found out that the frequency of hysterectomy in cases of placenta previa was 1.14%.<sup>18</sup> In our study, a low APGAR score was observed in 25.85% of neonates. Low APGAR frequency was 15.2% in a similar study conducted by Rao J *et al.*<sup>19</sup> Low birth weight was found to be 35.75% in our study. It was observed in our study that most of the babies (59.61%) with low birth weight had a low 5-minute APGAR score. Kollmann M *et al.* reported the

frequency of low birth weight associated with placenta previa to be 36.5%.<sup>20</sup> In our study, neonatal death was found to be 8.16%, the majority of the cases (75%) were associated with grade four placenta previa. Satti I *et al.* conducted a similar study and found out the frequency of neonatal death to be 5.6%.<sup>21</sup> In a local study conducted by Baloch I *et al.*, found that perinatal mortality in cases of placenta previa is 12%.<sup>22</sup>

## 5. Conclusion

Placenta previa has become a very common condition which may be attributable to higher rates of caesarian sections. It may lead to increased morbidity and mortality of the mother and the baby if not diagnosed and managed properly and timely. Such cases should be managed by experienced multidisciplinary teams in a tertiary care centre to minimize the rate of complications.

**CONFLICTS OF INTEREST-** None

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**Potential competing interests:** None to report

**Contributions:**

B.K, S.S.J, F.S.K, Q.N - Conception of study

B.K, S.S.J, F.M, - Experimentation/Study Conduction

B.K, F.S.K, F.M, R.G, -

Analysis/Interpretation/Discussion

B.K, S.S.J, F.M, R.G, Q.N - Manuscript Writing

B.K, F.S.K, F.M, - Critical Review

B.K, S.S.J, F.S.K, R.G, Q.N - Facilitation and Material analysis

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

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