



A PROSPECTIVE OBSERVATIONAL STUDY OF MATERNAL AND PERINATAL OUTCOME IN PLACENTA PREVIA

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ABSTRACT

Background: Placenta previa is an obstetric problem that contributes to significant fetomaternal morbidity and mortality. With the increasing incidence of caesarean section and advancing maternal age, cases of placenta previa will continue to rise. Hence, this study was conducted to determine the maternal and perinatal outcome in women with placenta previa. Methods: This prospective observational study consisted of 250 antenatal women with >28 weeks period of gestation, diagnosed as cases of placenta previa on routine ultrasound. Maternal outcome was noted in terms of mode of delivery like caesarean section-emergency or elective and complications like postpartum haemorrhage, need for blood transfusion, peripartum hysterectomy, ICU admission and maternal death. Perinatal outcome was assessed in terms of gestational age at birth, birth weight, live birth/still birth/intrauterine death, respiratory distress syndrome, APGAR at 1 minute and 5 minutes and NICU admission. Results: The incidence of placenta previa was found to be 5.1%. Majority of the patients were from the age group of 21-30 years, booked, multiparous and a significant percentage i.e. 39.2% had a history of at least one caesarean section. 42.4% patients had an emergency caesarean section. Blood transfusions were needed in 82.2% patients. Postpartum haemorrhage was seen in 6.4% cases. Peripartum hysterectomy was needed in 2% cases. 45.6% neonates had a preterm birth, 12% developed respiratory distress syndrome and neonatal mortality was seen in 3.2% cases. Conclusion: Maternal and perinatal morbidity and mortality as a complication of placenta previa is preventable. Measures like antenatal registration of all pregnant women, timely checkup, follow up with ultrasound and early referral to tertiary care centres equipped with facilities of blood transfusion, emergency caesarean section and neonatal care unit can contribute to a better outcome of the mother and neonate alike.

KEYWORDS : incidence, maternal complications, neonatal complications, placenta previa**INTRODUCTION**

Placenta previa describes a placenta that is implanted in the lower uterine segment, either over or very close to the internal cervical os. The National Institute of Health (NIH)-sponsored Fetal Imaging Workshop recommends the following classification¹:

- Placenta Previa: The internal os is covered partially or completely by placenta.
- Low Lying Placenta: Implantation in lower uterine segment is such that the placental edge does not cover the internal os but lies within 2 cm wide perimeter around the os.

Placenta previa is a major cause of vaginal bleeding in the late second and third trimester with an estimated prevalence of 5.2 per 1000 pregnancies.²

Several predisposing factors have been identified like prior history of placenta previa, previous caesarean births, multifetal gestation, previous uterine surgical procedure, increasing parity, increasing maternal age, assisted reproductive technology, smoking, previous abortion with history of dilatation and curettage etc.³ Placenta accreta spectrum (PAS) may be found in association with placenta previa.

Care in placenta previa patients is individualised and three prominent factors taken into consideration are fetal maturity, associated labour and bleeding severity. Emergency caesarean section rate in women with placenta previa is nearly 40%.⁴ For women who are near term and not bleeding, elective caesarean section is planned at 36-37⁶ weeks' gestation.⁵ Adverse maternal outcomes include peripartum hysterectomy, need for blood transfusion, postpartum hemorrhage etc. Most of the perinatal mortality is attributed to prematurity and its associated risks, particularly respiratory distress syndrome.

With the increasing incidence of caesarean section rates, increasing maternal age and wider accessibility to ultrasound, the number of cases of placenta previa and its complications including placenta accreta will continue to increase. We thus decided to investigate the maternal and perinatal outcome in placenta previa and the associated risk factors.

MATERIAL AND METHODS

It was a prospective observational study conducted in the Department of Obstetrics and Gynaecology at S.M.S. Medical College and Attached Hospitals, Jaipur from November, 2022 to November, 2023. Antenatal women with >28 weeks period of gestation, diagnosed as cases of placenta previa on routine ultrasound were included in the

study and the data was analysed using Descriptive statistics (frequency and percentage).

Inclusion Criteria

1. Cases of placenta previa >28 weeks period of gestation, diagnosed on routine ultrasound.
2. Women who understand the study and are willing to give written and informed consent.

Exclusion Criteria:

1. Other causes of antepartum haemorrhage.
2. Associated high risk conditions like hypertension, diabetes mellitus, cardiac disease etc.
3. Women with multifetal gestation.
4. Women included in other studies.

Sample Size

Sample size of 250 cases was determined at 95% confidence and 80% power to assess the maternal and perinatal outcome in placenta previa and calculate the incidence.

Statistical Analysis

The data was analysed using SPSS software version 21. Quantitative data was shown in percentage. Continuous variables were summarised as mean. Correlation was shown using Pearson's correlation coefficient. P value was calculated and said to be statistically significant when $p < 0.05$.

RESULTS

The total number of antenatal patients in our hospital during the study period was 61,736. The incidence of placenta previa was found to be 5.1%.

Table 1- Demographic Profile

Age Group (in years)	Frequency (n)	Percentage (%)
<20	12	4.8
21-30	189	75.6
31-40	49	19.6
Socioeconomic Status		
Upper	0	0
Upper Middle	12	4.8
Lower Middle	59	23.6
Upper Lower	37	14.8
Lower	142	56.8

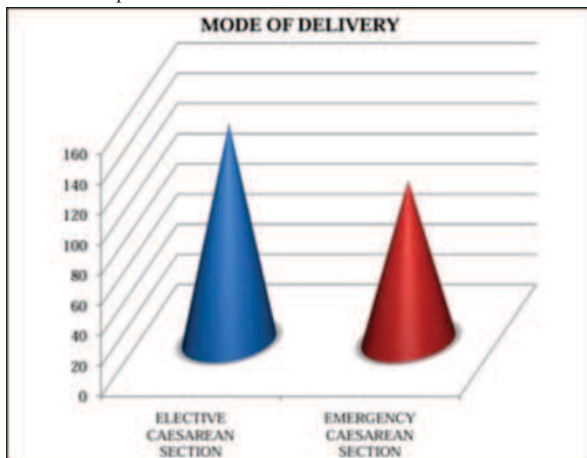
Area of residence		
Rural	161	64.4
Urban	89	35.6
Booking Status		
Booked	156	62.4
Unbooked	94	37.6

The above table shows the distribution of study population according to their demographic profile. In our study, majority (75.6%) of the females belonged to the age group of 21-30 years. The mean age was 27.14 ± 4.54 years. The risk of developing placenta previa was found to increase with increasing maternal age and this association was statistically significant (Pearson's correlation coefficient = 0.03; p value = 0.031). Maximum females i.e. 56.8% belonged to lower socioeconomic class. Majority of the women i.e. 64.4% belonged to rural area, whereas remaining 35.6% belonged to urban area. A pregnant woman is said to be booked if she has atleast three antenatal visits in addition to the first visit when she is registered. In our study, 62.4% females were booked.

Table 2- Obstetric Profile

Gravidity	Frequency (n)	Percentage (%)
Primigravida	74	29.6
Multigravida	176	70.4
Parity		
Nulliparity	96	38.4
Multiparity	154	61.6
No. of abortions		
0	190	76
1	42	16.8
≥ 2	18	7.2
No. of previous caesarean sections		
0	152	60.8
1	51	20.4
2	42	16.8
3	5	2
Past History		
History of uterine surgery	1	0.4
History of dilatation and curettage	40	16
History of Assisted Reproductive Technology (ART)	9	3.6
Malpresentations	65	26

Most of the women i.e. 70.4% were multigravidas. The gravidity of the study participants ranged from 1 to 7. Maximum females i.e. 61.6% were multiparous. Incidence of placenta previa was found to increase with increasing parity. This association was found to be statistically significant (Pearson's correlation coefficient= 0.16, p value= 0.048). 24% females had a history of abortion in past. 39.2% women had a history of atleast one caesarean section. 51 (20.4%) females had 1 caesarean section in past. 16.8% females had prior 2 caesarean sections and 2% patients had 3 caesarean sections in past. In our study, 16% patients had prior history of dilatation and curettage, 9 (3.6%) patients had history of use of assisted reproductive technology and only 1 (0.4%) patient had prior history of uterine surgery viz. myomectomy. Fetal malpresentation was seen in 26% cases. Breech was the most common malpresentation and was found in 23.2% cases.



Graph 1- Mode Of Delivery

As depicted in the above graph, 57.6% (n=144) patients had an elective caesarean section whereas 42.4% (n=106) underwent an emergency caesarean section for placenta previa. Placenta accreta spectrum (PAS) was found in 1.2% cases of placenta previa. All these cases of PAS had a prior caesarean birth.

Table 3- Maternal Complications In Placenta Previa

Maternal Complications	Frequency (n)	Percentage (%)
Postpartum haemorrhage	16	6.4
Need for blood transfusion	207	82.2
Peripartum hysterectomy	5	2
ICU Admission	1	0.4
Maternal death	1	0.4

Blood transfusions were needed in 207 patients. Out of these 207 patients, 5 needed massive blood transfusion (>4 units in 1 hour). 16 had postpartum haemorrhage (PPH), only 1 patient needed ICU admission and there was 1 maternal death. Peripartum hysterectomy was needed in 5 (2%) cases. Out of these 5 cases of peripartum hysterectomy, 3 were performed due to placenta accreta spectrum complicating placenta previa. Remaining 2 cases were performed due to failure to control atonic PPH with medical and conservative surgical interventions.

Table 4- Neonatal Parameters

Gestational age at birth	Frequency (n)	Percentage (%)
<30 weeks	11	4.4
30-33+6 weeks	36	14.4
34-36+6 weeks	67	26.8
37 weeks and above	136	54.4
Birth Weight Category		
Extremely low birth weight (ELBW)	4	1.6
Very low birth weight (VLBW)	18	7.2
Low birth weight (LBW)	125	50
Normal	103	41.2
APGAR score (at 1 minute)		
0-3	16	6.4
4-6	42	16.8
7-10	192	76.8
APGAR score (at 5 minutes)		
0-3	10	4
4-6	38	15.2
7-10	202	80.8

The above table shows that 54.4% neonates were term i.e. gestational age at birth was 37 weeks and above. Out of the remaining 45.6% preterm neonates, majority had a gestational age between 34- 36+6 weeks. 50% neonates were low birth weight, 7.2% neonates were very low birth weight and 4 were extremely low birth weight, thus contributing to significant neonatal morbidity. Majority of the neonates i.e. 76.8% had an APGAR score of 7-10 at 1 minute of birth. The APGAR score improved in most neonates at 5 minutes of birth.

Table 5- Neonatal Complications

Neonatal Complications	Frequency (n)	Percentage (%)
Preterm	114	45.6
Respiratory distress syndrome	30	12
Other complications (jaundice, refractory shock, sepsis, hypoxic ischemic encephalopathy, necrotizing enterocolitis, hypoglycemia)	39	15.6
Still birth	1	0.4
Intrauterine death	2	0.8
NICU admission	63	25.2
Mean duration of stay in NICU (in days)	11.14	
Neonatal mortality	8	3.2

The above table shows the prevalence of neonatal complications in cases of placenta previa. The percentage of still birth in placenta previa cases was 0.4%. 0.8% cases had intrauterine death. In our study, 45.6% neonates were preterm. 63 (25.2%) neonates required NICU admission. Respiratory distress syndrome was seen in 12% cases. 15.6% developed other complications like jaundice, refractory shock, hypoglycemia, sepsis, hypoxic ischemic encephalopathy and necrotizing enterocolitis. Neonatal mortality was seen in 3.2% cases.

DISCUSSION

The incidence of placenta previa in our study was found to be 5.1%. This is comparable to a retrospective study conducted by Zhang et al.⁵, who reported an incidence of 4.9%. A study conducted by Kavitha et al.⁷ in 2018 reported an incidence of 1.8%. Our centre is a tertiary care teaching hospital and many of our patients were referred from other areas, thus attributing to the higher incidence of placenta previa.

In our study, 75.6% females belonged to the age group of 21-30 years. Similar findings were reported in another prospective observational study conducted in Rajasthan in 2019.⁸

More than half of the females (56.8%) belonged to lower socioeconomic class and were residents of rural areas (64.4%). This highlights the lack of access to proper antenatal care at the periphery and a lack of control over predisposing factors such as an increased rate of caesarean sections and multiple abortions by untrained persons.

In our study, majority of the women i.e. 62.4% were booked cases. Studies by Oshodi Yusuf Abisowo et al.⁹ and Shaveta Jain et al.¹⁰ show that early booking in pregnancy affords early recognition and monitoring of placenta previa which could minimize the possibility of poorer outcome in sudden massive vaginal bleeding and lead to reduction in perinatal mortality and morbidity.

As many as 61.6% were multiparous women. In a retrospective case-control study by Lea Tuzović et al.¹¹, three or more previous pregnancies and parity of two and more were important obstetric factors for placenta previa development. The reason for advancing age and multiparity as a risk factor is not clear but it may be associated with the ageing of vasculature of the uterus. This causes placental hypertrophy and enlargement which increases the likelihood of the placenta encroaching on lower segment.

24% women in our study had a history of at least one abortion in the past. According to Ananth et al.¹², there is a strong association between having a spontaneous or induced abortion, and the subsequent development of placenta previa. Women with a history of spontaneous abortion had a relative risk of placenta previa of 1.6, while those with a history of induced abortion had a relative risk of 1.7. These findings suggest that pregnant women with a history of abortion should be regarded as high risk for placenta previa and be monitored closely.

39.2 % of our study participants had a prior caesarean birth, thus showing that previous caesarean section is an important risk factor for placenta previa. Our findings are consistent with a large number of studies worldwide including that by Urganci et al.¹³ that show the increasing incidence of placenta previa in parallel with the rising rate of caesarean delivery.

Risk factors like history of uterine surgery including dilatation and curettage accounted for 16% and 0.4% of the total cases in the current study. M. Andrikopoulou and colleagues¹⁴ found that women with history of gynaecologic surgery (dilatation and curettage, myomectomy, hysteroscopy, cone biopsy) were at significant risk for persistence of placenta previa until delivery.

In our study, 42.4% patients underwent an emergency caesarean section for placenta previa. This figure is much higher as compared to a study by ADO PAD (Antenatal Diagnosis of Placental Attachment Disorders) Study Group in which emergency caesarean was required in 31.2% placenta previa cases. This is due to the high burden of referred cases in our hospital, which caters to a large population of Eastern Rajasthan.¹⁵

Perinatal outcome was assessed with respect to gestational age at birth, birth weight, still birth, intrauterine death, respiratory distress syndrome, APGAR score at 1 minute and 5 minutes and NICU admission. The percentage of still birth in placenta previa cases was 0.4% and 0.8% cases had intrauterine death. In our study, 45.6% neonates were preterm which is consistent with the findings of a study by Rashmi Polnaya et al.¹⁶, where preterm birth complicated 47.9% placenta previa cases. 58.8% neonates had birth weight <2.5 kg. The association between low birth weight and placenta previa was chiefly due to preterm delivery. 25.2% neonates required NICU admission and mean duration of stay in NICU was 11.14 days. Similar results were found in another study by Santosh Kumari et al.¹⁷ 12% neonates developed respiratory distress syndrome which is supported by Ashete Adere et al.¹⁸ Most of the neonates had an APGAR score between 7-10

at 1 minute and 5 minutes of birth and needed no intervention.

CONCLUSION

Maternal and perinatal morbidity and mortality as a complication of placenta previa is preventable. Measures like antenatal registration of all pregnant women, timely checkup, follow up with ultrasound and early referral to tertiary care centres equipped with facilities of blood transfusion, emergency caesarean section and neonatal care unit can contribute to a better outcome of the mother and neonate alike. Family planning should also be given special emphasis as a strategy towards reduction in parity, decreasing caesarean rate and thereby the incidence of placenta previa.

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