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Original Research Article

# TO EXAMINE THE ASSOCIATION BETWEEN PLACENTA PREVIA AND ITS IMPACT ON MATERNAL AND FOETAL OUTCOMES

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## Abstract

**Background:** Placenta previa is a medical disorder characterised by the abnormal implantation of the placenta in the lower uterine segment or cervix. This condition poses a significant risk for postpartum haemorrhage and adverse outcomes for both the mother and the newborn, leading to increased morbidity and death rates. Aim: To examine the association between placenta previa and its impact on maternal and foetal outcomes. **Material and Methods:** The research assessed data from 110 pregnant women who had vaginal bleeding during the third trimester of pregnancy. These women were either symptomatic or asymptomatic and had been diagnosed with placenta previa using ultrasonography. Maternal outcomes encompassed various factors, such as the duration of maternal ICU stay during the delivery hospitalisation, the estimated blood loss as determined by clinical assessment, significant tachycardia and etc. The neonatal outcomes that were documented included the gestational age at delivery, the need for ventilator assistance within the first 24 hours after birth and the duration of the newborn hospitalization. **Results:** A total of 110 instances of placenta previa were recorded. The prevalence of Placenta previa was found to be 1.22%. The prevalence of placenta previa was found to be greatest among those aged 25-30 years, accounting for 81.82% of instances. The findings of this research indicate that 70 cases, accounting for 63.64% of the total, presented with antepartum haemorrhage. The predominant risk factor observed in this study was a prior history of abortion, accounting for 45 cases or 40.91% of the total sample. Among the cohort of 110 patients who were hospitalised, it was seen that the majority, namely 102 individuals (92.73%), had a hospital stay of less than 10 days. Out of the whole patient population, 65 individuals, accounting for 59.09% of the sample, necessitated blood or blood product transfusion. Among the 110 neonates delivered, a total of 4 cases were classified as stillbirths, representing a percentage of 3.64%. Among the 106 live-born infants, a total of 50, or 47.17%, necessitated admission to the NICU. **Conclusion:** Placenta previa has been shown to be related with both multiple gestation and malpresentation in the current pregnancy. The incidence of significant placenta previa is associated with a greater risk of unfavourable maternal and foetal outcomes as compared to placenta previa.

## INTRODUCTION

Placenta previa is a medical disorder characterised by the implantation of the placenta in the lower uterine segment or cervix. This condition poses a significant risk for postpartum haemorrhage and increases the morbidity and death rates for both the mother and neonate. According to a systematic review and meta-analysis conducted by Jauniaux et al. from London, UK, the median frequency of placenta previa was found to be 0.56% (interquartile range [IQR] 0.39-1.24). Additionally, the median prevalence of placenta previa with PAS was revealed to be 0.07% (IQR 0.05-0.16).[1-3] The aetiology of placenta previa remains unexplained and is believed to be complex in nature. Several risk factors have been identified, including advanced maternal age, past surgical procedures involving the uterine cavity, prior miscarriage with operational care, prior placenta previa, and the use of assisted reproductive technologies.[4,5] The condition is linked to negative outcomes for both the mother and the newborn. Placenta previa is correlated with newborn complications, including lower APGAR


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scores, low birth weight, preterm delivery, higher length of hospitalisation, and an elevated risk for respiratory distress syndrome. Additionally, it is linked to maternal complications such as postpartum haemorrhage, septicaemia, hysterectomy, and maternal mortality.[6,7] After conducting a comprehensive review of the existing literature, it has been noticed that there are varying perspectives on the outcomes and risk factors associated with placenta previa. The study conducted by Sheiner et al. has reached the conclusion that although irregular implantation alone is not an independent risk factor for perinatal death, placenta previa should be regarded as an indicator of potential obstetric difficulties. Therefore, the identification of placenta previa should prompt a thorough assessment with prompt delivery in order to minimise the maternal and neonatal problems that are often associated with this condition.[8] According to the findings of Feng et al., it has been shown that maternal age of 35 years or older and a history of three or more past uterine operations are associated with an increased likelihood of complete previa during mid-pregnancy.[9] According to the findings of Daskalakis et al., women with placenta previa who have a previous history of numerous caesarean births are at a higher risk for obstetric hysterectomy. The impact of the kind of PP on mother and newborn outcomes was shown to be negligible, save for the observation that infants in the partial PP group had lower Apgar scores compared to those in the full PP group.[10]

## MATERIALS AND METHODS

A prospective observational research was conducted inside the Obstetrics and Gynaecology department of a Tertiary Care institution. The research assessed data from 110 pregnant women who had vaginal bleeding during the third trimester of pregnancy. These women were either symptomatic or asymptomatic and had been diagnosed with placenta previa using ultrasonography. The data was collected from women visiting the Antenatal Clinic or the Emergency Department throughout the study period. This research included all instances of placenta previa that were verified using either transabdominal ultrasonography or transvaginal ultrasonography after the 28th week of gestation. The research excluded pregnant women who were diagnosed with low lying placenta and other kinds of Antepartum Haemorrhage (APH), such as abruptio placente, local reasons, traumatic haemorrhage, and unclear causes, if the cases occurred before 28 full weeks of gestation. The study collected demographic information such as age, parity, gestational age, and history of prior caesarean delivery or other uterine surgery. Additionally, detailed records were kept about the participants' medical and obstetric history, as well as information pertaining to intraoperative and postoperative occurrences.

The researchers used descriptive analysis to present the occurrence rate of poor outcomes among mothers and newborns. Maternal outcomes encompassed various factors, such as the duration of maternal ICU stay during the delivery hospitalisation, the estimated blood loss as determined by clinical assessment, the number of units of packed red cells, fresh frozen plasma, cryoprecipitate, and platelets transfused, the occurrence of significant hypotension (defined as systolic blood pressure below 80 mm Hg or diastolic blood pressure below 50 mm Hg on at least two occasions with a minimum time interval of 30 minutes), significant tachycardia (defined as maternal pulse exceeding 120 beats per minute at any point after delivery), the need for maternal ventilator support, any unforeseen additional maternal surgical procedures (including repairs of other organs and hysterectomy), as well as the length of the maternal hospital stay. The neonatal outcomes that were documented included the gestational age at delivery, the need for ventilator assistance within the first 24 hours after birth, the classification of size for gestational age (small [<10th percentile], suitable, big [>90th percentile]), and the duration of the newborn hospitalisation. The data collection was limited to the delivery hospitalisation period, so any problems or procedures that happened after the discharge from the delivery hospitalisation were not included in the analysis.

## RESULTS

Throughout the designated research period, a cumulative count of 8978 deliveries was recorded. A total of 110 instances of placenta previa were recorded. The prevalence of Placenta previa was found to be 1.22%. The majority of cases (68.18%) were classified as unbooked. The prevalence of placenta previa was found to be greatest among those aged 25-30 years, accounting for 81.82% of instances. This was followed by a prevalence of 10.91% among individuals aged 30-35 years. The study revealed that a significant proportion of cases (41.82%) consisted of second gravida, with third gravida accounting for the second highest proportion (27.27%). The majority of cases (65.45%) were presented at 37 weeks gestational age, followed by 27.27% of cases at 34-37 weeks. Additionally, a small proportion of patients (3.64%) were hospitalised at 30-34 weeks. The identified risk variables included a history of prior caesarean section, abortion, twin gestation, and myomectomy. The predominant risk factor observed in this study was a history of prior caesarean section, accounting for 30% of cases. Among the problems examined, severe anaemia accounted for 4 cases, representing 3.64% of the total, whereas malpresentations


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accounted for 15 cases, representing 13.64% of the total.

The findings of this research indicate that 70 cases, accounting for 63.64% of the total, presented with antepartum haemorrhage. Out of a total of 110 instances of placenta previa, it was determined by ultrasonography that 3 cases (2.73%) had morbidly adherent placenta. Based on the manner of admission, it was found that 99 patients (90%) were hospitalised via the Emergency department, whereas 11 patients (10%) were admitted through the OPD. The majority of instances, namely 72 cases (65.45%), were seen in patients with a gestational age of 37 weeks and above. This was followed by 30 cases (27.27%) in patients with a gestational age between 34-37 weeks. Additionally, 4 patients (3.64%) were hospitalised with a gestational age between 30-34 weeks, and another 4 patients were admitted at 30 weeks gestation age. Out of a total of 110 instances of PP patients, severe anaemia was seen in 4 individuals, accounting for 3.64% of the sample. Moderate anaemia was identified in 33 patients, representing 30% of the cohort, while the majority of cases (62 individuals, or 56.36%) exhibited mild anaemia. Merely 10% of the participants had haemoglobin levels above 11gm/dl. Approximately 33% of the individuals had moderate to severe anaemia at admission. The predominant risk factor observed in this study was a prior history of abortion, accounting for 45 cases or 40.91% of the total sample [Table 1].

Out of the patients hospitalised with PP, the majority (89.09%) fell into class 1 according to Benedetti's categorization of haemorrhage. Class 2 accounted for around 7.27% of the cases, while class 3 comprised 3.63% of the cases. Based on the classification of placenta previa, the findings indicate that 60 cases (54.55%) were identified as having low lying placenta, 14 cases (12.73%) exhibited marginal placenta previa, 5 cases (4.54%) displayed partial placenta previa, and 31 cases (28.18%) were diagnosed with whole placenta previa [Table 2].

In the current investigation, a significant number of cases (35.45%) necessitated the administration of massive blood transfusion. Additionally, in 13.64% of cases, both haemostatic suture and blood transfusion were employed, while in 5.45% of cases, only haemostatic suture was utilised. Uterine artery ligation was performed in 13.64% of cases, medical management was employed in 12.73% of cases, pressure compression was utilised in 5.45% of cases, and peripartum hysterectomy, along with blood transfusion, was performed in 13.64% of cases. Out of the total number of patients, 11 (10%) had postpartum problems. Eighty percent (88 out of 110) of the patients required admission to the HDU subsequent to the surgical procedure.

Among the cohort of 110 patients who were hospitalised, it was seen that the majority, namely 102 individuals (92.73%), had a hospital stay of less than 10 days. A smaller proportion, consisting of 5 patients (4.55%), required a stay ranging from 10 to 15 days. Additionally, a minority of 3 instances (2.73%) had a longer hospital stay exceeding 16 days. The average duration of hospitalisation is 8.33 days. Out of the whole patient population, 65 individuals, accounting for 59.09% of the sample, necessitated blood or blood product transfusion. Additionally, a subset of 11 patients, constituting 10% of the cohort, had a successful recovery although with modest problems [Table 3].

Among the 110 neonates delivered, a total of 4 cases were classified as stillbirths, representing a percentage of 3.64%. Among the 106 live-born infants, a total of 50, or 47.17%, necessitated admission to the Neonatal Intensive Care Unit (NICU). Out of the newborns seen, 8 (7.27%) were classified as early preterm, while 20 (18.18%) had a birth weight below 2 kg. Among the cohort of 50 newborns admitted to the Neonatal Intensive Care Unit (NICU), it was observed that 14 children (28%) required a duration of stay ranging from 2 to 5 days. Additionally, 4 infants (8%) necessitated a stay beyond 5 days, while the other 30 infants (60%) were discharged within a period of less than 2 days. Two newborns, accounting for 4% of the total, passed away while receiving care at the Neonatal Intensive Care Unit (NICU) [Table 4].

**Table 1: Demographic profile**

| Age | Number | Percentage |
|---|---|---|
| Below 25 | 8 | 7.27 |
| 25-30 | 90 | 81.82 |
| 30-35 | 12 | 10.91 |
| Booking status | | |
| Booked | 35 | 31.82 |
| Unbooked | 75 | 68.18 |
| Gravida | | |
| I | 20 | 18.18 |
| II | 46 | 41.82 |
| III | 30 | 27.27 |
| IV | 5 | 4.55 |
| V | 9 | 8.18 |
| Mode of admission | | |
| Emergency | 99 | 90 |
| OPD | 11 | 10 |


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**Table 2: Antenatal profile of patients**

| Antenatal profile | No. of Patient | Percentage |
|---|---|---|
| Previous history of abortion | 45 | 40.91 |
| MAP in USG | 3 | 2.73 |
| PP in ER | 96 | 87.27 |
| PP < 30 weeks of gestation | 4 | 3.64 |
| PP 30-34 weeks of gestation | 4 | 3.64 |
| PP 34-37 weeks of gestation | 30 | 27.27 |
| PP >37 weeks of gestation | 72 | 65.45 |
| Antepartum haemorrhage | 70 | 63.64 |
| Haemoglobin level < 6.9 g/dl | 4 | 3.64 |

**Table 3: Type of MAP**

| Types of Placenta Previa | Number | Percentage |
|---|---|---|
| Low Lying | 60 | 54.55 |
| Marginal | 14 | 12.73 |
| Partial | 5 | 4.54 |
| Total | 31 | 28.18 |

**Table 4: Morbidity associated with PP**

| Morbidity | Number | Percentage |
|---|---|---|
| Hysterectomy | 14 | 12.73 |
| HDU transfer | 88 | 80 |
| Hospital stay (days) | | |
| Below 10 | 102 | 92.73% |
| 10-15 | 5 | 4.55% |
| Above 16 | 3 | 2.73% |
| Blood transfusion | 39 | 35.45 |
| FFP | 44 | 40 |

**Table 5: Neonatal outcome**

| Neonatal outcome | No. of Patient | Percentage |
|---|---|---|
| Average gestational age | 34 weeks | |
| Average birth weight | 2.71±0.33 | |
| NICU admission( days) | 50 | 47.17 |
| Below 2 days | 30 | 60 |
| 2-5 | 14 | 28 |
| Above 5 days | 4 | 8 |
| No of dead at NICU | 2 | 4 |

## DISCUSSION

The prevalence of placenta previa, as shown in several epidemiological studies, exhibited significant variation across different nations. In Japan, the incidence of placenta previa was found to be 1.39 per 100 singleton births according to a research,[11] but a population-based study conducted in Israel reported a much lower rate of 0.42%.[12] In a series of retrospective investigations, the prevalence rates of placenta previa in singleton pregnancies among women were reported as 0.73%, 1.00%, 1.10%, 1.50%, and 2.80% in Saudi Arabia,[13] Greece,[14] Australia,[15] Korea,[16] and USA,[17] accordingly. The research conducted revealed a prevalence rate of 1.22% for previa. In 2016, Fan D et al performed a meta-analysis in China that revealed a comparable prevalence rate of placenta previa, namely 1.24%.[18] One potential factor contributing to the observed disparities in reported prevalence rates is the presence of regional or ethnic variations among different groups.

The majority of women in the study fell between the age range of 25 to 30 years, accounting for 81.82% of the sample. Additionally, it was observed that the majority of these women had experienced childbirth. A research conducted by Rajeshwari RR et al,[19] in Tamil Nadu had a similar outcome, indicating that the age range of 20-29 years had the greatest prevalence of patients with PP, accounting for 79.9% of the total. The prevalence of MAP in our research investigation was determined to be 15 cases, accounting for 13.64% of the total population under review. The elevated prevalence of MAP seen in our research may be ascribed to the fact that our hospital serves as a tertiary referral centre. According to Sarojini et al,[20] a study found that 0.64% of the births had complications related to placenta previa, whereas 4.7% of the deliveries were associated with MAP. Gilliam et al,[21] observed a rise in the occurrence of placenta previa (PP) as both parity and previous Caesarean sections increased. They further noted that the combined impact of parity and prior Caesarean sections was more significant than the influence of either variable independently. Specifically, the probability of PP was nearly nine times higher in women with a parity greater than four and more than four previous Caesarean sections.

The research done by Rajeshwari RR et al,[19] shown that the proportion of unbooked patients was 84.6% and 84.3% in their study, however our analysis


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indicated a prevalence of 68.18% unbooked cases. The ANC services should aim to increase the number of scheduled patients via high-risk screening. This would contribute to improving the well-being of both mothers and newborns, as well as enhancing our demographic data to align with worldwide benchmarks. The predominant gestational age seen in our research cohort, characterised by the occurrence of bleeding, was 37 weeks or later, accounting for 72 cases (65.45%).

The findings of this research indicate that the majority of cases were represented by second gravida (41.82%), followed by third gravida (27.27%). The prevalence of multigravida and grand multipara in this study is much lower compared to prior research conducted by Michelle AW,[22] (61.16% for multigravida and 12.5% for grand multipara) and Steven Clark,[23] (44.06% for multigravida and 30.9% for grand multipara).

It was determined that the predominant risk factor seen was a prior history of abortion, accounting for 45 cases (40.91%). A study conducted by a group of authors at a tertiary centre in India revealed that 46% (57 out of 124) of the patients included in their analysis had a documented history of prior uterine surgery, such as caesarean section, myomectomy, or curettage.[24] According to a separate study, it was found that 42.6% of the patients included in the research had a previous record of undergoing a caesarean section, while 26.5% had a history of abortion.[25] The existing body of research has consistently shown that prior uterine surgery and uterine curettage are recognised as risk factors for placenta previa. Our investigation corroborates these findings. Out of the total number of patients, 11 (10%) had postpartum problems. The rates of postpartum haemorrhage (PPH) seen in the current research were found to be greater when compared to the study conducted by Rajeswari R.[19] There is a need for the implementation of proper hygiene practises, as well as a more suitable and timely approach in the care of placenta previa. This should include the administration of a full dosage of antibiotics, along with the observance of aseptic precautions.

Among the 110 neonates that were delivered, a total of 4 infants, accounting for 3.64% of the sample, were classified as stillborn. Among the 106 infants that were delivered alive, a total of 50 infants, accounting for 47.17% of the sample, necessitated admission to the Neonatal Intensive Care Unit (NICU). Out of the neonates included in the study, 8 (7.27%) were classified as early preterm and 20 (18.18%) had a birth weight below 2 kg. Among the 50 newborns admitted to the NICU, it was observed that 14 children (28%) required a duration of stay ranging from 2 to 5 days. Additionally, 4 infants (8%) necessitated a stay beyond 5 days, while the other 30 infants (60%) were discharged within a period of less than 2 days. Two newborns, accounting for 4% of the total, passed away while receiving care in the Neonatal Intensive Care Unit (NICU). A comparable result is reported by Ranjana R et al.[26] The occurrence of placenta praevia in pregnant individuals presents possible risk factors and associated effects

## CONCLUSION

The current research emphasises a stronger correlation between placenta previa and a medical history that includes prior caesarean section and past abortions. Placenta previa has been shown to be related with both multiple gestation and malpresentation in the current pregnancy. The incidence of significant placenta previa is associated with a greater risk of unfavourable maternal and foetal outcomes as compared to mild placenta previa. Timely referral of cases with placenta previa to a tertiary care obstetrics clinic equipped with a blood bank and neonatal intensive care unit (NICU) is essential. This intervention has the potential to enhance maternal and perinatal outcomes.

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