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Original Research Article

AN OBSERVATIONAL STUDY ON PLACENTA PREVIA AND ITS EFFECT ON MATERNAL AND FOETAL OUTCOMES

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ABSTRACT

Background: Placenta previa is an obstetric complication where the placenta abnormally implants in the lower uterine segment, causing bleeding and obstructing delivery. It increases the risk of maternal haemorrhage and adverse foetal outcomes. The study aimed to assess the maternal and foetal outcomes in pregnancies complicated by placenta previa. **Materials and Methods:** The prospective, observational study was conducted on 60 patients at the Madurai Medical College over one year. Detailed clinical evaluation, including obstetric history, physical examination, and ultrasonography, was performed to assess placental location and foetal well-being. MRI was done when needed, and routine laboratory tests were conducted for all participants. **Result:** The mean maternal age was 29.43±4.56 years, with the majority (53.34%) belonging to the 30-35 years age group. 48.33% patients presented between 33-37 weeks of gestation, and 63.33% had preterm deliveries. Elective caesarean section was the most common mode of delivery (41.66%). The anterior location of the placenta was noted in 36.66% of cases. MRI findings indicated features of placenta accreta spectrum in 50% of participants. The most common presenting complaint was painless bleeding (62.33%). Postpartum haemorrhage occurred in 21.67% of cases, and 16.6% had antepartum haemorrhage. Prophylactic SR cannula was the most frequent haemostatic measure (25%). Among neonates, 23.33% had low birth weight (<2 kg), 30% had an APGAR score of 6 at one minute, and 31.67% required NICU admission. **Conclusion:** Placenta previa significantly contributes to maternal and foetal morbidity, mainly due to haemorrhage and preterm delivery, highlighting the importance of early diagnosis and timely multidisciplinary management to optimise outcomes.

INTRODUCTION

Placenta previa is a major obstetric complication defined by the unusual implantation of the placenta in the lower segment of the uterus, leading to either partial or complete obstruction of the internal cervical os. This abnormal placement of the placenta can lead to significant maternal and foetal health issues, mainly because of the increased risk of antepartum haemorrhage and preterm delivery.[1] The Latin previa means going before, and in this sense, the placenta goes before the foetus into the birth canal.[2] Its classification is based on the level of placental covering over the cervical opening; types range from low-lying to full previa, each of which carries various dangers to the mother and foetus.[3]

There are multiple known risk factors for placenta previa, which has a complex aetiology. One significant factor is prior caesarean sections, with the risk rising in direct proportion to the number of caesarean deliveries.[4] A higher incidence of placenta previa has also been linked to advanced maternal age, namely in women 35 years of age or older. This could be because of cumulative uterine alterations and a higher chance of previous uterine surgeries.[5] Multiparity and a history of uterine surgery or curettage further complex the risk, suggesting that endometrial scarring and altered uterine architecture play a role in aberrant placental implantation.[1]

Diagnosis of placenta previa relies predominantly on imaging modalities, with transabdominal and transvaginal ultrasonography serving as the gold standard for localisation of the placenta relative to the cervical os. In certain cases, particularly when the depth of placental invasion is in question, magnetic

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resonance imaging (MRI) may be used to additional anatomical detail and guide management decisions.[4] Management strategies for placenta previa are tailored according to the type of previa, gestational age at presentation, severity of bleeding, and the condition of both mother and foetus.[3,6] Expectant management, involving close monitoring and hospitalisation, is often pursued in cases where bleeding is minimal and the pregnancy is preterm, to prolong gestation to improve foetal maturity.[7] The timing and mode of delivery are important considerations; elective caesarean section is generally recommended for complete or major placenta previa to prevent catastrophic haemorrhage during labour.

Emergency interventions may be required in the event of significant maternal haemorrhage or foetal compromise. The availability and capability of neonatal intensive care units (NICU) are also integral to management, as preterm delivery and low birth weight are common sequelae, requiring specialised neonatal support.[3] The maternal and perinatal outcomes associated with placenta previa are affected by the severity of the condition, the presence of comorbidities such as placenta accreta, and the timeliness of intervention. Maternal risks include massive haemorrhage, need for blood transfusion, and, in severe cases, obstetric hysterectomy, particularly when abnormal placental is present.[4]

The risks include preterm birth, low birth weight, increased NICU admissions, and elevated perinatal mortality.[8] As gestational age developments, neonatal morbidity and mortality likely to decrease. The complex relationship of maternal and foetal considerations necessitates a multidisciplinary approach to optimise outcomes for both the mother and the child.[6]

Aim

The study aimed to assess the maternal and foetal outcomes in pregnancies complicated by placenta previa.

MATERIALS AND METHODS

This prospective, observational study was conducted on 60 pregnant women beyond 28 weeks of gestation at the Department of Obstetrics and Gynaecology, Madurai Medical College, over one year. This study was carried out after the approval of the Institutional Ethical Committee (Reference number-3374/IEC/2024-13). Informed and written consent was obtained from all the patients.

Inclusion Criteria

Pregnant women beyond 28 weeks of gestation who were multiparous, had a previous history of placenta previa, previous caesarean section, recurrent pregnancy loss, or conception through assisted reproductive technology (ART). Only patients with stable vital signs and those who provided informed consent were included in the study.

Exclusion Criteria

Women < 20 years or > 45 years of age, those with gestational age < 28 weeks, or with a known bleeding disorder or coagulopathy, not willing to provide informed consent were excluded.

Methods

Detailed clinical history, thorough physical examination, and antenatal ultrasonography were performed. Each patient's history included obstetric background, previous uterine surgeries, parity, and known risk factors, such as prior caesarean section, high parity, increasing maternal age, and multifetal gestation. Patients underwent ultrasonography (USG) of the abdomen and pelvis to determine the location of the placenta and assess foetal well-being. MRI was performed to further evaluate placental attachment and invasion. Routine laboratory investigations, including Complete Blood Count (CBC), random blood sugar, Renal Function Test (RFT), Liver Function Test (LFT), and serum electrolytes, were carried out. Data were presented as frequencies and percentages.

RESULTS

The mean age was 29.43 ± 4.56 years, with the majority belonging to the 30–35 years age group (53.34%). According to BMI classification, 71.67% were overweight. Most women (43.33%) had an interpregnancy interval between 12 and 18 months. At admission, nearly half (48.33%) were between 33 and 37 weeks of gestation, while at delivery, 56.67% delivered between 36 and 39 weeks. Most deliveries were preterm (63.33%), and elective LSCS was the most common mode of delivery (41.66%), followed by normal vaginal and emergency LSCS deliveries (31.67% each). [Table 1]

Table 1: Demographic and obstetric characteristics

Variable	Category	Frequency (%)
Age group in years	20–25	17 (28.33%)
	25–30	11 (18.33%)
	30–35	32 (53.34%)
BMI	Normal	17 (28.33%)
	Overweight	43 (71.67%)
Interpregnancy intervals (months)	12–18	26 (43.33%)
	18–28	12 (20.00%)
	29–38	13 (21.66%)
	39–48	9 (15.00%)
Gestational age at admission (weeks)	28–32	27 (45.00%)
	33–37	29 (48.33%)
	>37	4 (6.67%)

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Gestational age at delivery (weeks)	32–35	26 (43.33%)
	36–39	34 (56.67%)
Delivery	Term	22 (36.67%)
	Preterm	38 (63.33%)
Mode of delivery	Normal vaginal delivery	19 (31.67%)
	Elective LSCS	25 (41.66%)
	Emergency LSCS	19 (31.67%)

Anterior placenta previa was the most common finding (36.66%), followed by posterior and low-lying placenta, each seen in 31.67% of cases. Based on placenta previa classification, Type 3 was the most frequent (38.33%), followed by Type 4 (30.00%). Placenta Accreta Spectrum (PAS) were present in half of the participants (50%), whereas 48.33% showed no PAS features. The anterior placenta was more commonly observed (60%) compared to the posterior placenta (40%). [Table 2]

Table 2: Imaging and placental findings

Variable	Category	Frequency (%)
USG findings	Anterior previa	22 (36.66%)
	Posterior previa	19 (31.67%)
	Low lying	19 (31.67%)
Placenta previa type	1	10 (16.67%)
	2	9 (15.00%)
	3	23 (38.33%)
	4	18 (30.00%)
MRI findings	PAS suspected	30 (50.00%)
	No PAS features	29 (48.33%)
	Suggestive of PAS	1 (1.67%)
Placental location	Anterior	36 (60.00%)
	Posterior	24 (40.00%)

The most common presenting complaint was painless bleeding, observed in 62.33% of mothers, while 36.67% were admitted for safe confinement. Multiparity or anaemia was the most frequent comorbidity (36.6%), followed by advanced maternal age (30%) and chronic hypertension (20%). Diabetes and uterine fibroids were less common. Antepartum haemorrhage occurred in 16.66% and postpartum haemorrhage in 21.67% of cases, whereas no complications in 61.67%. To control bleeding, prophylactic SR cannula placement was the most commonly used procedure (25%), followed by uterine artery ligation (11.67%), while peripartum hysterectomy was required in only 3.33% of cases. [Table 3]

Table 3: Clinical presentation, comorbidities, complications, and bleeding control procedures

Variable	Category	Frequency (%)
Presenting complaints	Safe confinement	22 (36.67%)
	Painless bleeding	38 (62.33%)
Comorbidities	Diabetes	6 (10.00%)
	Chronic Hypertension	12 (20.00%)
	Advanced maternal age	18 (30.00%)
	Multiparity/anaemia	22 (36.60%)
	Uterine fibroids	5 (8.33%)
Complications	Antepartum haemorrhage	10 (16.66%)
	Postpartum haemorrhage	13 (21.67%)
	None	37 (61.67%)
Procedures to control bleeding	Uterine artery ligation	7 (11.67%)
	Prophylactic SR cannula	15 (25.00%)
	Peripartum hysterectomy	2 (3.33%)
	None	36 (60.00%)

The majority of the newborns (55.00%) had a birth weight between 2–2.5 kg, followed by 23.33% with a birth weight < 2 kg and 21.67% weighing > 2.5 kg. At 1 minute APGAR score, most newborns had a score of 6 (30.00%), followed by 5 (26.67%), and 4 (23.33%). At 5 minutes APGAR score, the majority had a score of 7 (41.67%), followed by 6 (28.33%), while 10% each had scores of 5, 8, and 9. Regarding foetal outcome, 68.33% of the newborns required NICU admission, whereas 31.67% remained on the mother's side. [Table 4]

Table 4: Distribution of birth weight, APGAR scores, and foetal outcome

Variable	Category	Frequency (%)
Birth weight in kg	< 2	14 (23.33%)
	2–2.5	33 (55.00%)
	> 2.5	13 (21.67%)

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APGAR at 1 minute	4	14 (23.33%)
	5	16 (26.67%)
	6	18 (30.00%)
	7	4 (6.67%)
	8	8 (13.33%)
APGAR at 5 minutes	5	6 (10.00%)
	6	17 (28.33%)
	7	25 (41.67%)
	8	6 (10.00%)
	9	6 (10.00%)
Foetal outcome	Mother side	19 (31.67%)
	NICU admission	41 (68.33%)

DISCUSSION

In our study, the mean age of participants was comparable to findings reported in similar studies. Kothapalli and Kolluru found a mean maternal age of 28.65 ± 5.24 years, while Awad et al. in Egypt reported a higher mean age of 31.82 years.[1,9] Similarly, Ahmed in Egypt documented a mean age of 30.92 ± 3.67 years.[10] The mean age in our study was slightly higher than that reported by Kothapalli et al. but lower than that of Awad et al. and Ahmed et al., suggesting regional variation in maternal age at conception and delivery.[1,9,10] Anuradha et al. reported that 74% belonged to the 25–30 years age group, and Adere et al. observed 55.43% in the same range.[11,12] Thus, while the majority of mothers in our study were aged 30–35 years, other studies from different populations showed a younger predominant age group, indicating demographic and regional diversity.

Our study showed that most participants underwent LSCS. This finding aligns closely with the previous studies, as Devarmani and Tallur reported an LSCS rate of 82%, Usha and Jayanthi observed 86.90%, Anuradha et al. reported 79.72%, and Virgin et al. found 68.7%.[13,14,11,15] Victor et al. reported the highest LSCS rate at 96.47%, while Maheswari et al. noted 72%.3,16 Although the overall prevalence of LSCS was high across all studies, our findings were slightly lower than those of Usha and Jayanthi and Victor et al., which may be attributed to institutional protocols and patient case severity.[3,14] Mothers between 33 to 37 weeks included a significant proportion of our sample. In comparison, Kothapalli and Kolluru reported 34% of mothers within the same gestational range, Sarojini and Radhika found 27.4%, while Victor et al. observed a higher of 74.12% in this group.[1,3,17] This variation could be due to differences in obstetric management and referral patterns among tertiary centres.

Placental localisation patterns were comparable to those reported in other studies. Kothapalli and Kolluru found 33% of participants with type 3 placental location, which was nearly identical to our proportion of 33.8% type 3.1 However, Sarojini and Radhika identified type 2 as most common (27.2%), while in studies conducted at Jammu and by Rajeswari and Rubini 36.32% and 37% respectively belonged to type 2.[17,12,18] These differences suggest regional or diagnostic variability in classifying placenta types. In our study, painless bleeding was a frequent presentation. Kothapalli and Kolluru documented 56% of mothers with painless bleeding, while a Chennai-based study reported 45%.[1,15] The slightly higher incidence in our series may be due to later presentation or more advanced placental separation at diagnosis.

Anaemia was observed in a significant proportion of our participants. Adere et al. reported only 8.91% with anaemia, Virgin et al. 4.04%, and Victor et al. 1.76%, while a Thanjavur study noted a higher rate of 15.6%.[12,15,3,18] The comparatively higher prevalence in our study suggests differences in antenatal nutritional supplementation or socioeconomic background. Postpartum haemorrhage (PPH) occurred in 21.67% of our participants, lower than that reported by Adere et al. (38.22%) and Victor et al. (47%) but higher than that seen in Maheswari et al. (28.8%).[12,3,16] This variation might be related to different obstetric management approaches and preventive measures used during delivery. Asthma was found in 8.33% of our participants, higher than the 2.02% reported in a Chennai-based study, indicating potential regional environmental or genetic differences in respiratory comorbidities.[15]

Our study showed a significant rate of NICU admissions. Devarmani and Tallur found 24% of babies admitted to NICU, Usha and Jayanthi reported 39.28%, a Bangladesh study found 39.4%, and studies from Jammu and Thanjavur reported 46.54% and 23.7%, respectively.[13,14,11,12,18] In contrast, Maheswari et al. reported a much higher proportion of 83%.[16] Our NICU admission rate falls in the mid-to-high range of these reports, reflecting differences in neonatal care practices and case severity across institutions. Among intraoperative interventions, uterine artery ligation was performed in 11.67% of our participants. Usha and Jayanthi reported a significantly higher rate of 42.85%, Sarojini and Radhika found 1.9%, and Victor et al. observed 21%.[14,17,3] Hysterectomy was required in 3.33% of our participants, which was lower than the rates reported by Usha and Jayanthi (9.52%) and Victor et al. (36.2%), but similar to Sarojini and Radhika (4.7%).[14,3,17] These findings suggest variable thresholds for surgical intervention, influenced by institutional expertise and the severity of bleeding complications.

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Only a smaller number of babies in our study had a normal birthweight > 2.5 kg. Both the studies by Usha and Jayanthi and by Anuradha et al. reported 50% of neonates with normal birthweight, Virgin et al. observed 54.3%, and Maheshwari et al. reported 55%.[11,14,15,16] In contrast, our proportion of low birthweight infants was higher. Arora et al. and Kholsa et al. found 77% and 66% of neonates, were underweight, whereas Victor et al. reported 32.32% underweight.[19,20,3] Therefore, this may be due to variation in antenatal care, maternal nutrition, and timing of delivery.

In our study, the majority of neonates had a score above 5 at one minute and above 7 at five minutes. Awad et al. noted 42% of neonates with scores above 7 at one minute and 85.9% with scores above 7 at five minutes.[9] The findings from our study were lower than those reported by Awad et al., reflecting differences in perinatal asphyxia incidence and immediate resuscitation efficacy.

Limitations

Being hospital-based and observational in design, the study may not account for all potential confounding variables such as variations in prenatal care, maternal comorbidities (e.g., anaemia, thyroid disorders, asthma), or differences in hospital protocols. Although prospective in design, its observational nature limits the ability to infer causality between maternal factors and outcomes. As the study focuses primarily on immediate birth outcomes without long-term neonatal follow-up, the findings may not be generalisable to the wider population.

CONCLUSION

The placenta previa remains a significant cause of maternal and foetal morbidity. Most affected women were of advanced maternal age and multiparous, with prior caesarean section being a major risk factor. Painless vaginal bleeding was the most common presentation, and a high number of cases required caesarean delivery to prevent haemorrhagic complications. Maternal morbidity was mainly due to anaemia, antepartum and postpartum haemorrhage, though the need for hysterectomy was low. Foetal complications were primarily due to preterm birth and low birth weight, with most neonates requiring NICU admission. Early diagnosis by ultrasonography, careful antenatal monitoring, and timely intervention through a multidisciplinary approach are essential to improve maternal and perinatal outcomes in placenta previa.

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