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Original Research Article

A STUDY ON PREVALENCE AND OUTCOME OF PLACENTA PREVIA IN A TERTIARY CARE CENTRE IN VILLUPURAM

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ABSTRACT

Background: Obstetric haemorrhage, especially due to placenta previa, remains a major preventable cause of maternal mortality. Placenta previa, commonly seen in the second trimester, poses serious risks to both the mother and the fetus. This study aimed to investigate the prevalence and outcomes of placenta previa. **Materials and Methods:** This cross-sectional study was conducted on 75 patients at the Government Villupuram Medical College and Hospital over 2 years. On admission, a detailed history, clinical examination, and relevant investigations were performed. Management was tailored based on the degree of placenta previa, severity of bleeding, and foetal condition, with minor cases managed conservatively and major cases requiring caesarean delivery. Maternal and neonatal outcomes, including complications and mode of delivery, were recorded and analysed. **Result:** Most patients were aged 20–29 years (74.6%) and multiparous (73.3%). Minor degree placenta previa was more common (70.66%), and caesarean section was the predominant mode of delivery (93.33%). The most frequent symptoms were abdominal pain (56.4%) and vaginal bleeding (50%). Major placenta previa was associated with higher rates of second-trimester bleeding (22.73%), breech presentation (13.6%), and adherent placenta (9.09%).Preterm deliveries and low birth weight were linked to increased perinatal mortality (PNM), particularly in the 1000–1499 g and <34 weeks groups. The PNM rate was higher in major placenta previa (9.09%) than in minor (3.77%) cases, although the difference was not significant. **Conclusion:** Placenta previa was most common in multiparous women, with prior caesarean section as a major risk factor. High rates of maternal and perinatal complications highlight the need for early detection and planned tertiary care delivery.

INTRODUCTION

Obstetric haemorrhage, along with hypertension and infection, forms the leading triad of causes of maternal mortality. Among these, obstetric haemorrhage remains a major yet preventable contributor to maternal deaths.[1] It accounts for 25% of all maternal deaths, among which antepartum haemorrhage (APH) accounts for 3-5% of all pregnancies. Placenta previa accounts for 1/5th of all cases of APH, and it is the third most common cause of APH-related maternal mortality.[2] Placenta previa is a condition in which the placenta is implanted in the lower uterine segment and lies over or near the cervix. Placenta previa is associated with adverse maternal and neonatal complications.[3]

The term placenta previa is usually used when the placenta lies in the lower uterine segment after 28 weeks of gestation. Before 28 weeks of gestation, it is denoted as a low-lying placenta. As per placental migration theory, most of the placenta migrates away from the lower uterine segment as the gestational age increases.[4] Placenta previa is classified as central or total, partial, and marginal placenta previa or low-lying placenta. It contributes to a 4-fold increase in second-trimester bleeding and neonatal mortality rates.[3]

Placenta previa varies with different ethnicities, and globally, its incidence ranges from 3-5 per 1000 pregnancies (0.3-0.5%), with a noted association with the increasing caesarean sections.[5] A study suggests that Asian women have the highest prevalence of 0.64% compared to other ethnic groups, with all requiring a caesarean section.[6] There is a decreasing tendency in maternal mortality worldwide, but developing countries still face major trouble in reducing maternal mortality.[5] So, to achieve a zero maternal mortality rate, we should emphasise the

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need to reduce preventable causes of obstetrics haemorrhage like placenta previa, which is one of the life-threatening issues for both the mother and the foetus.[7]

The introduction of prenatal ultrasound (USG) has significantly improved the early detection of placenta previa, allowing for timely diagnosis during routine second-trimester scans. This advancement has contributed to better maternal outcomes and reduced the risks associated with this condition.[8] Even with advances, maternal mortality remains elevated due to adherent placenta, probably linked to the increasing incidence of caesarean deliveries, IVF treatments, and prior uterine surgeries.[9] This may also result in delays or gaps in standardised protocols for early diagnosis, timely referral, and management of placenta previa across healthcare settings, thereby increasing the risk of mortality from placenta previa.[7]

The clinical manifestation of placenta previa is usually painless vaginal bleeding in the second or third trimester of pregnancy. It can present as either antepartum or postpartum haemorrhage (PPH). Maternal complications of placenta previa include preterm labour, preterm rupture of membranes, haemorrhagic shock, sepsis, and amniotic fluid embolism. Foetal complications include prematurity, malpresentation, hypoxia, perinatal death, foetal growth restriction, and congenital anomalies.[10] Although there have been many studies on placenta previa, there is limited literatureon region-specific data to address local healthcare challenges and improve clinical outcomes. Therefore, this study aimed to evaluate the prevalence and outcomes of placenta previa in a tertiary care centre in Villupuram, Tamil Nadu.

MATERIALS AND METHODS

This cross-sectional study included 75 patients who attended the Department of Obstetrics and Gynaecology, Government Villupuram Medical College and Hospital, from December 2019 to December 2021. Before initiating the study, it was approved by the Institutional Ethics Committee. Written informed consent was obtained from the parents before patient enrolment.

Inclusion Criteria

Women with painless bleeding PV after 28 weeks of gestation, diagnosed with placenta previa or low-lying placenta on imaging, and advised for follow-up were included.

Exclusion Criteria

Patients unwilling to participate in the study, pregnant women with painful bleeding PV, bleeding PV before 28 weeks of gestation, cervical polyps, carcinoma, local trauma, and local causes of bleeding were excluded.

Methods: On admission, a detailed history was obtained, including the patient's demographic profile, antenatal check-up records, and presenting complaints such as duration of bleeding, associated pain, and foetal movement perception. Obstetric and personal histories were also documented. Clinical examination involved the assessment of nutritional status, pallor, oedema, signs of shock, and vital signs, including pulse, blood pressure, and respiratory rate. The cardiovascular and respiratory systems were examined, and obstetric examination included uterine height, contractions, foetal lie, presentation, position, head engagement, foetal heart sounds, and uterine tenderness. Vital signs, input-output records, and intravenous access were maintained, and blood samples were collected for further investigations.

Laboratory investigations included haemoglobin estimation, blood grouping and Rh typing, bleeding and clotting time, and urine analysis for albumin, sugar, and microscopy. USG was performed if it had not been performed previously or after 28 weeks' gestation. Further management was based on whether the patient presented with APH or came for follow-up.Initial management followed the RCOG 2018 guidelines and included securing IV access, collecting blood samples, initiating IV fluids, and administering blood or blood products based on the severity of bleeding. Antenatal corticosteroids were administered in preterm cases. Subsequent management depended on whether bleeding had stopped, the severity of ongoing bleeding, and foetal well-being, leading to either immediate delivery or expectant management strategies.

Patients were categorised according to the type of placenta previa based on USG evaluation. Placenta previa is classified into four types based on the extent to which the placenta covers the internal opening of the cervix (OS): total (type 1) when it fully covers the OS, partial (type 2) when it covers it partially, marginal (type 3) when it reaches the OS without covering it, and low-lying (type 4) when it lies within 2 cm of the OS without touching it, usually before 28 weeks of gestation.For clinical purposes, these are grouped as major placenta previa (types 1 and 2) and minor placenta previa (types 3 and 4).

Minor degree placenta previa cases were managed vaginally unless complications arose, whereas major degree cases underwent emergency caesarean section. Uterotonics such as oxytocin, methergine, and prostaglandins were used to prevent PPH.Neonates were managed with appropriate resuscitative care, and those requiring further support were admitted to the NICU. Maternal and foetal outcomes were recorded, including the type of APH, mode of delivery, need for blood transfusion, duration of hospital stay, associated risk factors, and foetal details such as survival status, gestational age, APGAR score, birth weight, and NICU admission.

Statistical Analysis

The data were analysed and presented as frequencies and percentages.Data analysis was performed using IBM SPSS Statistics (version 25), and a p-value of < 0.05 was considered statistically significant.

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RESULTS

Most patients were aged 20–29 years, i.e., 56 (74.6%), followed by 13 patients aged 30–35 years; however, patients <35 years were significantly associated with placenta previa (p=0.024). The percentage of male and female babies was comparable (49.33% vs. 50.67%), and most cases were booked (96%) and multiparous (73.3%). Common associated factors included abdominal pain (58.6%) and a history of abortion (13.3%). Only one case involved multiple gestations (1.33%) with no significant association (p=0.325), and no foetal anomalies were observed, which was significant (p<0.0001).Most patients had an inter-pregnancy interval of 2–4 years (53.3%), but this finding was not significant (p = 0.165).Active management was employed in the majority (85.3%) of cases and was significantly associated with placenta previa (p=0.047).Other variables, including parity, gestation, and booking status, were not significantly associated with the outcome (p>0.05) [Table 1].

Table 1: Association of maternal and obstetric factors with placenta previa

		Placenta previa	P value
Age in years	< 35	72 (96%)	0.024
	> 35	3 (2.6%)	
Gender of the baby	Male	37 (49.33%)	0.223
	Female	38 (50.67%)	
Status	Booked case	72 (96%)	0.255
	Unbooked	3 (4%)	
Parity	Primi	12 (16%)	0.642
	Multi (2-3)	55 (73.3%)	
	Grand multi (> 4)	8 (10.6%)	
Abdominal pain	Present	44 (58.6%)	0.326
	Absent	31 (41.4%)	
Abortion	Present	10 (13.3%)	0.305
	Absent	65 (86.6%)	
Gestation	Multiple gestation	1 (1.33%)	0.325
	Singleton	74 (98.67%)	
Foetal anomalies	Yes	0 (0%)	<0.0001
	No	75 (100%)	
Interpregnancy interval in years	< 2	35 (46.6%)	0.165
	2-4	40 (53.3%)	
Management	Active	64 (85.3%)	0.047
	Expectant	11 (100%)	

The majority of placenta previa cases were of minor degree (70.66%) and were most commonly classified as type 2 (62.66%). Over half of the deliveries occurred at ≥ 37 weeks of gestation (56%), and caesarean section was the predominant mode of delivery (93.33%). Emergency deliveries accounted for 84% of the total deliveries, and all vaginal deliveries were spontaneous. Spinal anaesthesia was the most commonly used (82.66%). Regarding neonatal outcomes, 43.42% of newborns required NICU admission, and 18.42% had an APGAR score of < 7. The most common causes of perinatal morbidity and mortality were prematurity (35.52%) and respiratory distress syndrome (21.05%), respectively. Blood product transfusion was frequent, with the majority receiving PRBC transfusions (63.79%) [Table 2].

Table 2: Clinical profile, management, and perinatal outcomes in placenta previa cases

		Frequency (n%)
Degree of placenta previa	Minor degree	53 (70.66%)
	Major degree	22 (29.33%)
Type of placenta previa	1	6 (8%)
	2	47 (62.66%)
	3	6 (8%)
	4	16 (21.33%)
Gestational age at delivery in weeks	< 30	3 (4%)
	30-32	5 (6.66%)
	32-34	11 (14.66%)
	34-36	14 (18.66%)
	≥ 37	42 (56%)
Mode of delivery	Vaginal	5 (6.66%)
	LSCS	70 (93.33%)
Type of LSCS	Emergency	63 (84%)
	Elective	7 (9.33%)
Route of delivery- vaginal	Augmented with oxytocin	0 (0%)
	Spontaneous	5 (100%)
Type of anaesthesia	General	8 (10.66%)
	Spinal	62 (82.66%)
Perinatal morbidity	Resuscitation	5 (6.57%)

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	NICU admission	33 (43.42%)
	None	39 (51.31%)
Cause of perinatal mortality (PNM)	Asphyxia	3 (3.94%)
	Prematurity	27 (35.52%)
	IVH	1 (1.31%)
	RDS	16 (21.05%)
	None	28 (36.84%)
APGAR score in newborn	< 7	14 (18.42%)
	> 8	58 (1.31%)
Blood components	Platelets	2 (3.45%)
	PRBC	37 (63.79%)
	FFP	17 (29.31%)
	Cryoprecipitate	2 (3.45%)

The most frequently reported symptoms among patients with placenta previa were abdominal pain (56.4%) and vaginal bleeding (50%). Among the risk factors, a history of one prior LSCSwas predominant (28%), followed by that of two prior LSCS (10.66%).Other factors, such as abortion (12%), multifetal gestation (1.33%), and Rh isoimmunization (4%), were less common, and 44% of the cases had no identifiable risk factors [Table 3].

Table 3: Presenting symptoms and risk factors in placenta previa cases

		Frequency (n%)
Presenting symptoms	Vaginal bleeding	39 (50%)
	Abdominal pain	44 (56.4%)
	Draining PV	10 (13.4%)
	Reduced foetal movements	3 (3.8%)
	Safe confinement	11 (14.6%)
Risk factors	Abortion	10 (12%)
	Multifetal gestation	1 (1.33%)
	Previous 1 caesarean section	21 (28%)
	Previous 2 caesarean sections	8 (10.66%)
	Myomectomy	0
	Rh isoimmunisation	3 (4%)
	None	32 (44%)

Preoperatively, second-trimester bleeding was more frequent in major cases (22.73%) than in minor cases (5.66%), whereas first-trimester bleeding and severe anaemia were similar in both groups. Malpresentation was noted in both groups, with breech presentation being more common in major placenta previa (9.09%). As for intra- and post-operative complications, PPH was predominant in both groups (43.4 and 59.09%), followed by higher blood loss(39.62 and 72.73%). The need for hysterectomy and adherent placenta was more frequent in the major placenta previa group [Table 4].

Table 4: Distribution of pre-, intra- and post-operative complications in minor and major placenta previa

		Placenta previa	
		Minor	**Major**
Pre-operative complications	1st trimester bleeding	3 (5.66%)	2 (9.09%)
	2nd trimester bleeding	3 (5.66%)	5 (22.73%)
	Severe anaemia < 7g/dl	3 (5.66%)	1 (4.55%)
	Malpresentation (a,b,c)	8 (15.09%)	4 (18.18%)
	a) Transverse lie	2 (3.77%)	1 (4.55%)
	b) Breech	4 (7.55%)	2 (9.09%)
	c) Oblique lie	2 (3.77%)	1 (4.55%)
	PIH	5 (9.43%)	2 (9.09%)
	IUD	2 (3.77%)	1 (4.55%)
Intra and post-operative complications	Shock/Hypotension	3 (5.66%)	0
	Sepsis	0	0
	Febrile Morbidity	0	0
	PPH	23 (43.4%)	13 (59.09%)
	High blood loss	21 (39.62%)	16 (72.73%)
	Hysterectomy	4(7.55%)	4(18.18%)
	Adherent placenta	1(1.89%)	2(9.09%)

The majority of neonates born to mothers with placenta previa had a birth weight above 2500 grams (54.6%), with only two perinatal deaths recorded in this group. A notable number of deaths (4) occurred in the 1000–1499 g birth weight category. No deaths were observed in babies weighing 1500–2499 g, and there were no births in the extremely low birth weight group (500–999 g) [Table 5].

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Table 5: Birth weight distribution and associated PNM in placenta previa

Birth weight in grams	Births	Deaths
500-999	0	0
1000-1499	10	4
1500-1999	6	0
2000-2499	19	0
>2500	41	2

The PNM rate was higher in cases of major placenta previa (9.09%) than in those of minor placenta previa (3.77%), although the difference was not significant (p =0.324). Similarly, while no PNM occurred among vaginal deliveries, six deaths (7.89%) were reported following LSCS; however, this was also not significant (p=0.243). Gestational age had a notable influence, with the highest PNM observed in the 28-33-week group (5.26%), whereas only 1.31% mortality occurred in both the 34-36 and ≥ 37 week groups [Table 6].

Table 6: Association of placenta previa type, mode of delivery, and gestational age with perinatal deaths

		Perinatal deaths	P value
Type of placenta previa	Minor	2 (3.77%)	0.324
	Major	4 (9.09%)	
Mode of delivery	Vaginal	0	0.243
	LSCS	6 (7.89%)	
Gestational age in weeks	28-33	4 (5.26%)	-
	34-36	1 (1.31%)	
	37+	1 (1.31%)	

DISCUSSION

Placenta previa is a major obstetric complication contributing significantly to maternal and perinatal morbidity. This study aimed to determine the prevalence, clinical profile, and outcomes of placenta previa cases at a tertiary care centre in Villupuram, Tamil Nadu.In the present study, placenta previa was more common among women aged 20–29 years (74.6%) and multiparous women (73.3%). Women aged <35 years were significantly associated with placenta previa (p = 0.024). Similar to our findings, Gupta et al.analysed 364 patients and reported that placenta previa was most common in the age group of 26-30 years (55.42%), and the majority of the cases were multigravida (71.97%).[11] Thus, indicating a significant prevalence among multiparous and young women.

In our study, most cases were booked (96%) and had received antenatal care; however, complications were notably higher among unbooked patients. Strengthening our findings, Wakankar et al. reported a higher prevalence of unbooked cases (58.20%), along with a higher incidence of complications among unbooked cases.[12] Thus, emphasising the importance of institutional follow-up for better outcomes.

In our study, mostcases were of minor degree (70.66%) and were most commonly classified as type 2 (62.66%). Over half of the deliveries occurred at ≥ 37 weeks of gestation (56%), and caesarean section was the predominant mode of delivery (93.33%). Aligning with our findings, Kumari et al. reported that the majority of cases were minor degree (78.68%) and caesarean section was the predominant mode of delivery (96.7%).[13] In contrast, Chung et al. report that the majority had major placenta praevia (57%), and most cases were linked to earlier deliveries (36.1 weeks).[14]

In our study, the most frequently reported symptoms among patients with placenta previa were abdominal pain (56.4%) and vaginal bleeding (50%). Among the risk factors, a history of one prior LSCS was predominant (28%), followed by that of two prior LSCS (10.66%). Other factors included abortion (12%), multifetal gestation (1.33%), and Rh isoimmunization (4%). Supporting our findings, Dulay et al. reportthat the symptoms can manifest suddenly as painless vaginal bleeding, and it may occur as early as 16 weeks of gestation; the bleeding can be heavy, and sometimes result in haemorrhagic shock.[15] Similarly, Kollmann et al.state that the most frequent risk factors included prior uterine surgery (49%), maternal age > 35 years (29.3%), multiparity (57%), prior caesarean delivery (22.8%), recurrent abortions (22.8%), and history of placenta previa (10.8%).[16]

In our study, second-trimester bleeding was more common in major placenta previa cases (22.73%), and malpresentation was frequently observed in major cases (18.18%).Post-operative complications were more frequent in the major group, with PPH observed in 59.09% of patients and high blood loss noted in 72.73% of major cases. The need for hysterectomy and adherent placenta were also more common in major placenta previa (18.18% and 9.09%, respectively).In line with our findings, Patel et al. reported that the majority of patients hadanaemia (41.7%), and the major complications were bleeding (47.9%) and PPH (45.8%).[17] Similarly, Reddi Rani et al. reported a 20% incidence of each malpresentation and severe anaemia.[18] Ahmed et al. reported that 15% required hysterectomy and approximately 26.9% had placenta accreta.[19] This indicates that major placenta previa

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is highly associated with pre-, intra-, and post-operative complications.

In our study, PNM rates were higher in the 1000–1500 g groups and lowest in the > 2500 g group.PNM was more common in major placenta previa (9.09%), and all perinatal deaths occurred in the LSCS group (7.89%). The highest PNM was observed in preterm births at 28–33 weeks' gestation (5.26%). Supporting our findings, Kumari et al. reported a higher incidence of PNM in the 1000–1400 g group (66.6%) and the lowest in the > 2500 g group (3.3%). Additionally, they observed the highest PNM in the 28–33 weeks gestational age group (31.25%).[13] Thus, indicating that lower birth weight, LSCS, and preterm birth in placenta previa cases can significantly increase PNM.

Placenta previa, particularly of the major degree, was associated with increased maternal and perinatal complications, such as PPH, high blood loss, hysterectomy, and preterm delivery. Early diagnosis and planned delivery at tertiary centres are key to improving outcomes.

Limitations

The study was limited by its single-centre design and small sample size, which may not represent broader population patterns.

CONCLUSION

The prevalence of placenta previa was notable in patients with prior caesarean sections and multiparity. Major placenta previa was associated with increased maternal complications such as PPH, high blood loss, and need for hysterectomy, as well as higher PNM, especially in preterm and low-birth-weight infants.Future multicentre studies with larger samples are needed to refine diagnostic protocols and develop standardised management strategies to improve both maternal and neonatal outcomes.

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