Section: Obstetrics and Gynaecology

Original Research Article

A STUDY ON PLACENTA PREVIA REPORTING AT A TERTIARY HEALTH CENTRE AND ITS PERINATAL OUTCOME

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ABSTRACT

Background: Placenta previa is a major obstetric complication characterized by implantation of the placenta in the lower uterine segment, partially or completely covering the cervical os. It is associated with antepartum hemorrhage, preterm delivery, and increased maternal and perinatal morbidity. With rising caesarean section rates and advancing maternal age, the incidence of placenta previa is increasing, making early diagnosis and timely intervention crucial. **Aim:** To evaluate the incidence, risk factors, maternal and perinatal outcomes of placenta Previa reported at a tertiary health centre. **Materials and Methods:** This hospital-based observational study was conducted in the Department of Obstetrics and Gynaecology, Government Dharmapuri Medical College, from July 2024 to June 2025. A total of 100 antenatal women diagnosed with placenta previa by ultrasonography and admitted during the study period were included. Data regarding maternal demographics, obstetric history, clinical presentation, ultrasound findings, maternal outcomes, and perinatal outcomes were collected and analyzed using SPSS version26.Chi-square test was applied, with $p<0.05$ considered statistically significant. **Results:** Most women were aged 26–30 years (33%) and multiparous (68%).Previous caesarean section was observed in 21% and uterine surgeries in 8%. Antepartum bleeding was the most common presentation (62%). Complete placenta previa was the most frequent type (44%). Caesarean section was performed in 83% of cases, with 73.5% being emergency procedures. Maternal complications included postpartum hemorrhage (12%), intraoperative hemorrhage (7%), anaemia (36%), and blood transfusion (49%). Peripartum hysterectomy was required in 2%, with no maternal mortality. Among neonates,52% were low birth weight,23% required NICU admission, and perinatal mortality was 6%. No significant differences were found in maternal outcomes between anterior and posterior placenta groups. **Conclusion:** Placenta previa remains a high-risk obstetric condition associated with significant maternal morbidity and adverse perinatal outcomes, predominantly due to hemorrhage and prematurity. Early diagnosis by ultrasonography, vigilant monitoring, and multidisciplinary management can optimize maternal and neonatal prognosis.

INTRODUCTION

Placenta previa is a significant obstetric complication characterized by the abnormal implantation of the placenta in the lower uterine segment, partially or completely covering the internal cervical os. This aberrant placentation can lead to antepartum hemorrhage, preterm birth, and increased maternal and perinatal morbidity and mortality. Globally, the incidence of placenta previa ranges between 0.3% and 1% of pregnancies, though there has been a noted increase in recent decades, potentially due to rising maternal age, prior caesarean deliveries, and other obstetric interventions. [1,2]

In India, hemorrhage remains a leading cause of maternal mortality, accounting for approximately 38% of maternal deaths, with placenta previa being one of the major contributors.[3] The risk factors associated with placenta previa include advanced

maternal age, multiparity, previous caesarean delivery, uterine surgeries, multiple gestations, smoking, and assisted reproductive technology (ART).[4,5]Clinically, placenta previa commonly presents with painless vaginal bleeding in the second or third trimester, which can be recurrent and sometimes severe, necessitating careful monitoring and timely intervention.

Given the potential for severe maternal hemorrhage, peripartum hysterectomy, preterm birth, and adverse neonatal outcomes, early identification and management of placenta previa are crucial. Ultrasonography, especially transvaginal scanning, remains the gold standard for diagnosis and classification, with classification systems differentiating between complete, partial, marginal, and low-lying placentae. This study aims to evaluate the incidence, risk factors, maternal and perinatal outcomes of placenta previa reported at a tertiary health center, providing insights for improved obstetric care and planning.

Reviewof Literature

Placenta previa is derived from the Latin term "previa", meaning "going before," indicating the placenta's implantation over or near the cervical os ahead of the foetus in the birthcanal. Its prevalence has increased globally, with reported incidences varying from0.3% to 1% of all deliveries and higher rates in populations with advanced maternal age or prior uterine surgery. At tertiary centers, reported incidences range between0. 4% to 0.8%,with some studies indicating rates as high as 3-4 per 1000 births in high-risk populations.

Classification and Pathophysiology

Placenta previa is classified based on the degree of coverage of the internal cervical os:

- Complete placenta previa: The placenta entirely covers the internal os.
- Partial placenta previa: The placenta partially covers the os.
- Marginal placenta previa:The edge of the placenta reaches but does not cover the os.
- Low-lying placenta:The placenta implants in the lower uterine segment without reaching the internal os.

The National Institutes of Health(NIH)-sponsoredFetal Imaging Workshop (Rebety,2014) recommends the following USG-based classification:

- Placenta previa: The placenta lies directly over the internal os. The internal os is covered partially or completely by placenta. Earlier terms such as "total" or "partial" previa have largely been replaced by this single definition.
- Low-lying placenta: The placental edge does not cover the internal os but lies within a 2-cm distance from it. The previously used term marginal previa (placenta at the os margin but not overlying it) is now included under low-lying placenta.

The dynamic nature of placental positioning during pregnancy, termed "placental migration," is influenced by differential growth of the uterine segments and trophotropism— preferential placental growth toward well-perfused uterine regions. However, low-lying

Placentain the presence of prior caesarean scars are less likely to "migrate," maintaining a high risk of persistent placenta previa until term.

- **Epidemiology and Risk Factors**

Globally, the incidence of placenta previa has risen over the past three decades. Several demographic and clinical factors contribute to this increase:

- Maternal Age: Advanced maternal age (>35 years) significantly increases the risk, with studies showing a prevalence of 1.1% in women ≥35 years compared to 0.5% in younger women.
- Parity: Multiparous women, particularly those with parity ≥5, have higher rates of placenta previa.
- Previous Caesarean Delivery: A history of caesarean section is a strong risk factor. The risk escalates with the number of prior caesareans, with women having ≥6 prior caesareans exhibiting incidence rates up to 3.4%.
- SmokingandSubstanceUse: Cigarette smoking and cocaine use have been associated with placental hypoxia and compensatory hypertrophy, increasing risk.
- Multiple Gestations: Multifetal pregnancies show elevated risk due to multiple implantation sites.
- Assisted Reproductive Technology (ART): ART, including IVF, is associated with increasedincidence,potentiallycompoundedbyol dermaternalageandhigherratesof multiple gestations.
- Uterine Surgery and Abortions: Previous uterine surgeries, including myomectomy or curettage, predispose to abnormal placentation.

- Clinical Features

Painless vaginal bleeding is the hall mark of placenta previa. Typically presenting after mid-trimester, the bleeding maybe recurrent and vary inseverity. It can precipitate antepartum hemorrhage, pretermlabor, and emergency caesarean deliveries. The pathophysiology involves partial placental separation due to remodeling of the lower uterine segment and cervical dilation. Complications include placenta accreta spectrum (PAS), postpartum hemorrhage, maternal anemia, and increased rates of peripartum hysterectomy.

- Diagnosis

Accurate diagnosis relies primarily on ultrasonography:

TransabdominalSonography: Useful for initial localization but may be limited by maternal obesity or bladder distension.

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- Transvaginal Sonography: Provides superior visualization of the internal os and lower uterine segment, safely performed even in cases with active bleeding.
- MRI: Reserved for suspected placenta accrete or complex cases, offering detailed visualization of placental adherence and invasion.

Digital cervical examination is avoided due to the risk of precipitating torrential hemorrhage. Serial ultrasonography is recommended, particularly in cases of low-lying placenta or prior caesarean scars, to monitor placental migration and plan delivery.

- Management

Management strategies are guided by gestational age, severity of bleeding, and foetal maturity:

- Expectant Management: In hemodynamicallystable women with no active bleeding, hospitalization or close outpatient monitoring with pelvic rest is recommended.
- Tocolysis: Limited use for 48 hours may be considered,thoughevidenceis sparse.
- Delivery Planning: Caesarean section is indicated in all cases of persistent placenta previa. Elective delivery is usually scheduled between 36–38 weeks.
- Surgical Interventions: In cases of severe hemorrhage or placenta accreta, interventions include uterine compression sutures, balloon tamponade, arterial ligation, or peripartum hysterectomy.

- Maternal and Perinatal Outcomes

Placenta previa significantly increases maternal morbidity and mortality. Maternal hemorrhage, anemia, and hysterectomy are key concerns, particularly in women with prior caesarean sections or PAS. Perinatal outcomes are impacted by preterm birth, lowbirth weight, and increased neonatal mortality. Population-based studies indicate that much of the neonatal morbidity is attributing able to prematurity rather than growth restriction, though as light increase in foetal growth restriction has been reported.

Studies emphasize the importance of early detection, careful antenatal monitoring, timely delivery planning, and multidisciplinary management in reducing maternal and perinatal complications. Tertiary care centers play a crucial role in managing high-risk cases and improving outcomes for both mother and child.

Aim and Objectives

Aim

To study the incidence, risk factors, maternal and perinatal outcomes of placenta previa among antenatal women admitted to a tertiary health care centre.

Objectives

1. To determine the incidence of placenta previa in pregnancies managed at the tertiary health centre.
2. To analyze maternal demographic and clinical risk factors (age, parity, previous caesarean section, uterine surgery, ART, etc.) associated with placenta previa.
3. To classify cases of placenta previa based on ultrasonographic findings and placental location.
4. To assess maternal outcomes in placenta previa, including antepartum hemorrhage, post partumhemorrhage,blood transfusion, operative complications,hysterectomy,and maternal mortality.
5. To evaluate perinatal outcomes inplacenta previa, including gestational age at delivery, birth weight, Apgar score, NICU admission, and perinatal mortality.
6. To compare maternal outcomes in relation to anterior versus posterior placental location.

MATERIALS AND METHODS

This is a hospital-based, observational study conducted at Department of Obstetrics and Gynaecology, Government Dharmapuri Medical College over a period of 1 year from July 2024 to June 2025 to evaluate the incidence, risk factors,and maternal and perinatal outcomes of placenta previa. All pregnant women diagnosed with placenta previa on ultrasonography and admitted to the labor and delivery unit during the study period were included. Women with coexisting placental abruption or other high-risk conditions unrelated to placenta previa were excluded. Data were collected from patient records and structured proformas, including maternal age, parity, previous caesarean sections, history of uterine surgeries, smoking or substance use, use of ART, and clinical presentation. Ultrasound findings, gestational age at diagnosis and placental classification were noted. Maternal outcomes, including hemorrhage, transfusion requirement, mode of delivery, and need for hysterectomy, were recorded. Perinatal outcomes included gestational age at delivery, birth weight, Apgar scores, NICU admission, and neonatal mortality. Management adhered to hospital protocols and current guidelines, including monitoring for bleeding, planning delivery according to gestational age and maternal-foetal condition, and performing caesarean delivery when indicated. Data were entered into SPSS version26. Descriptive statistics were used for maternal demographic variables, risk factors, and outcomes. Associations between risk factors and maternal or perinatal outcomes were analyzed using chi-square test with $p<0.05$ considered statistically significant.

RESULTS

During the study period, a total of 100 antenatal women with placenta previa were included. The majority of patients were in the 26–30 years age

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group (33%), followed by 21– 25years (28%). Only 4(4%) patients were < 20 years, while13(13%) were > 35years.Interms of parity, 32 (32%) were primi gravida, while the majority, 68 women (68%), were multipara (≥2 pregnancies). [Table No.1]

Table1:Maternal demographic profile

Variable	Category	Number(n=100)	Percentage(%)
Age (years)	<20	4	4
	21–25	28	28
	26–30	33	33
	31–35	22	22
	>35	13	13
Parity	Primigravida	32	32
	Multipara(≥2)	68	68

Out of 100 women, 21(21%) had a history of previous caesarean section, while 8(8%) had undergone other uterine surgeries such as myomectomy or dilatation and curettage. None of the women reported smoking or substance use during pregnancy. Two patients (2%) conceived following assisted reproductive technology (ART). Antepartum vaginal bleeding was the most common clinical presentation, observed in 62 women (62%). [Chart No.1]

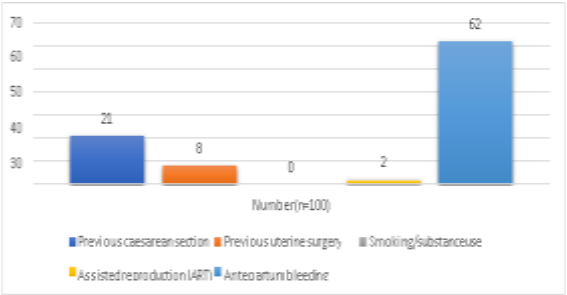

Chart 1: Risk factors and clinical history

A total of 42 women(42%) delivered before 34weeks of gestation,56 women (56%) deliveredBetween 34–36 + 6weeks, and 2 women(2%) delivered at 37weeks or more.

Table 2: Gestational age at delivery

Gestational age at admission	Number(n=100)	Percentage (%)
<34weeks	42	42
34–36+6weeks	56	56
≥37 weeks	2	2

Placental location was anterior in 57 (57%) and posterior in 43 (43%) cases. With respect to placental classification, complete placenta previa was the most common, observed in 44 women (44%), followed by partial placenta previa in 26 (26%), marginal in 18 (18%), and low-lying placenta in 12 (12%).[Table No.3] On ultrasound (USG) assessment, the majority of cases were classified as placenta previa, where the placental edge was within <1 cm from the internal os, accounting for 88 women (88%). The remaining 12 women (12%) had a low-lying placenta, where the placental edge was located between 1–2 cm from the internal os. [Table No.2]

Table 3: Distribution of patients based on Placental location

Variable	Category	Number(n=100)	Percentage(%)
Placental site	Anterior	57	57
	Posterior	43	43
Placenta type	Complete	44	44
	Partial	26	26
	Marginal	18	18
	Low-lying	12	12

Table 4: Distribution of patients based on USG Classification

USG Classification	Number(n= 100)	Percentage(%)
Placentaprevia(<1 cm)	88	88
Low-lyingplacenta(1–2cm)	12	12
Total	100	100

The majority of patients, 83(83%), underwent caesarean section, while only17(17%) delivered vaginally. Out of 83 cases who had caesarean section, 61 (73.5%) were emergency caesarean

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sections while 22 (26.51%) cases underwent elective caesarean section. [Chart No.2].

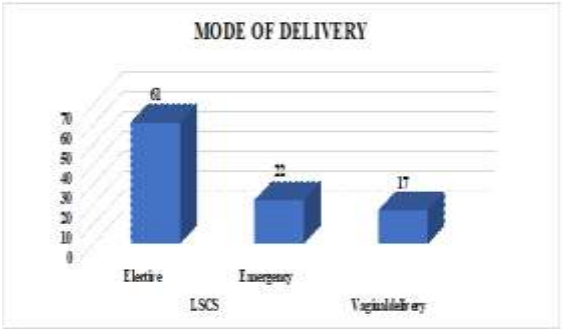

Chart 2: Mode of delivery

Postpartum haemorrhage was seen in 12 women (12%), and intraoperative haemorrhage in 7 cases (7%). A total of 36 women (36%) developed significant anaemia (Hb
<7g/dl), and 49(49%) required blood transfusion. Bladder injury was reported in 2(2%) cases who had caesarean section. Peripartum hysterectomy was performed in 2 (2%) cases due to uncontrolled bleeding, while there were no maternal deaths. [Chart No.3]

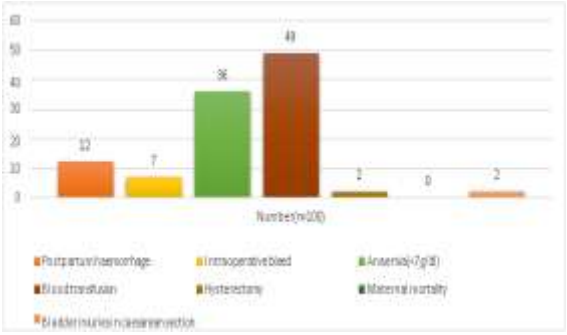

Chart 3: Maternal outcomes

Among the newborns, 6(6%) had birth weights less than 1.5kg, 46(46%) had weights
Between 1.5 – 2.5kg, and 48(48%) weighed more than 2.5kg. An Apgar score <7 at 5 minutes was observed in 11 neonates (11%). 23 new borns (23%) required NICU admission.There was 1still birth (1%) and 2 early neonatal deaths (2%), giving an overall perinatal mortality of 6%.

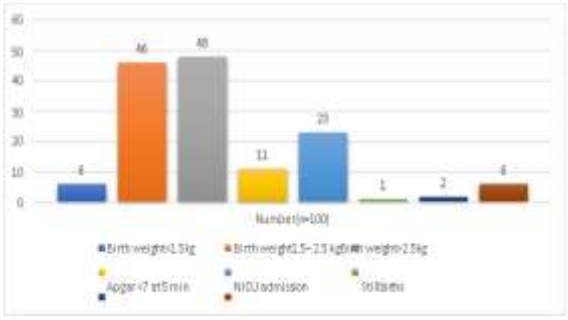

Chart 4: Fetal Outcomes

In women with an anterior placenta (n = 57), postpartum haemorrhage occurred in 7 cases (12.3%), while among those with a posterior placenta (n = 43), it occurred in 5 cases (11.6%).The odds ratio(OR) was 1.07 with a 95% confidence interval (CI) of 0.31–3.63,which was not statistically significant (p = 0.91). Intraoperative haemorrhage was observed in 4 women (7.0%) with an anterior placenta and in 3 women (7.0%) with a posterior placenta.The OR was 1.00 (95% CI: 0.21–4.70), with no significant difference (p > 0.99). Anaemia (haemoglobin < 7g/dl) was present in 20 women (35.1%) with ananterior placenta compared to 16 women (37.2%) with a posterior placenta. The odds ratio was 0.91(95%CI:0.40–2.05), showing no significant association (p = 0.82). Blood transfusion was required in 28 cases (49.1%)with an anterior placenta and 21 cases (48.8%) with a posterior placenta. The OR was 1.01 (95% CI:0.45–2.29), with no statistical significance (p=0.97).Peripartum hysterectomy was performed in 1 woman (1.8%) with an anterior placenta and 1 woman (2.3%) with a posterior placenta. The OR was 0.75 (95% CI: 0.05–11.7), which was not statistically significant (p > 0.99). There were no cases of maternal mortality in either the anterior or posterior placenta group. [Table No.5, Chart No.5]

Table 5: Maternal outcomes according to placental location

Characteristic	Anterior (n=57)	Posterior (n=43)	OR(95%CI)	p-Value
Postpartumhaemorrhage	7 (12.3%)	5 (11.6%)	1.07 (0.31–3.63)	0.91
Intraoperative haemorrhage	4 (7.0%)	3 (7.0%)	1.00 (0.21–4.70)	>0.99
Anaemia(<7g/dl)	20 (35.1%)	16 (37.2%)	0.91 (0.40–2.05)	0.82
Blood transfusion	28 (49.1%)	21 (48.8%)	1.01 (0.45–2.29)	0.97
Peripartumhysterectomy	1 (1.8%)	1 (2.3%)	0.75 (0.05–11.7)	>0.99
Maternalmortality	0 (0.0%)	0 (0.0%)	–	–

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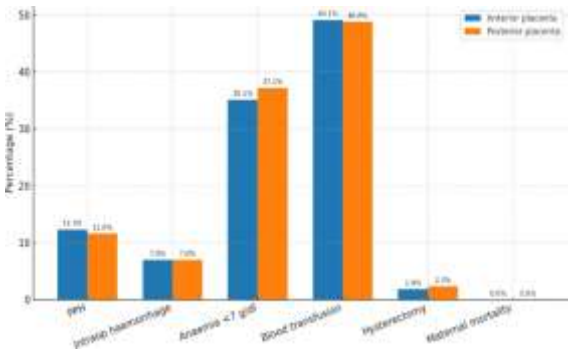

Chart 5: Maternal Outcomes in Relation to Placental Location

DISCUSSION

In the present study, 100 antenatal women diagnosed with placenta previa were evaluated for demographic profile, clinical presentation, maternal and perinatal outcomes. The majority of women belonged to the 26–30 years age group (33%), followed by 21–25 years (28%). This is consistent with the study by Lad SU et al., who also reported that most cases were in the 26–30-year age group.[6]SahuSA et al., emphasize increasing maternal age as an important risk factor for placenta previa, correlating with higher rates in women>35 years due to rising caesarean deliveries and assisted reproductive techniques.[7]

In the present study, multiparous women constituted 68%, while 32% were primi gravida. Similar results were reported by LadSU et al., where majority were gravid 2–

3. This could be attributed to repeated endometrial damage and scarring. This observation is also supported by Sahuetal., who identified multiparity as a significant epidemiological factor.

Previous caesarean section was documented in 21% of women, while 8% had undergone other uterine surgeries. These findings align with Brandstetter et al., whoob served previous caesarean delivery in 23.9% of placenta previa cases compared to 4.3% in controls, confirming its strong association.[8] The rising global caesarean rate has been consistently linked to increasing incidence of placenta previa and placenta accrete spectrum. Assisted Reproductive technology contributed to 2% of cases in our study, echoing the trends described by Sahu et al. inrecent literature. Antepartum hemorrhage was the most common presentation (62%), consistent with the observations of Verganietal., who reported higher bleeding before labor in women with placenta previa (29% vs 3%).This highlights the typical clinical course of placenta previa as an obstetric emergency.[9]

In our study, 42% delivered before 34 weeks, and 56% between 34–36+6 weeks, reflecting a high rate of preterm deliveries. Similar findings were noted by Lad et al., who reported prematurity in 44.3% of cases. Preterm birth remains the most frequent perinatal complication in placenta previa, as emphasized in the review by Sahu et al. and in predictive studies by Zhengetal.,where shortened cervical length and increased placental thickness were strong predictors of preterm birth.[10]

Anterior placenta was slightly more common (57%) compared to posterior (43%).With respect to type, complete placenta previa was the most frequent (44%), followed by partial (26%), marginal (18%), and low-lying (12%).On ultrasound classification, 88% of women had placenta previa (<1cmfromos), while12% were low-lying(1–2cm).This reinforces the role of ultra sonography in diagnosis and risk stratification.

In our series, 83% underwent caesarean section, while only 17% delivered vaginally. This is comparable to Lad et al. (81.15% LSCS), but slightly higher than Vergani et al., who reported caesarean delivery rates of 75%. The high caesarean rate in placenta previa reflects the standard management strategy to minimize maternal and neonatal complications.

Postpartum hemorrhage was observed in 12%, intraoperative hemorrhage in 7%, anaemia in 36%, and blood transfusion in 49%.These values are relatively lower than Lad et al., who reported PPH in 32.3% and transfusion in 86%. Differences could be explained by early diagnosis, better availability of blood products, and improved surgical techniques in our setup. Peripartum hysterectomy was required in 2% of cases, which is lower than figures in other studies. Importantly, there were no maternal deaths in our cohort, in contrast to Lad et al. (4.23% maternal mortality), reflecting better multidisciplinary management.

When comparing maternal outcomes between anterior and posterior placenta, no statistically significant differences were observed in haemorrhagic complications,transfusion, or hysterectomy rates. This is consistent with the findings of Verganietal,who also reported

Comparable blood loss and PPH rates between groups, suggesting that placental location perse may not significantly alter maternal morbidity.

Low birth weight (<2.5kg) was recorded in 52% of neonates,and 23% required NICU admission. Perinatal mortality was 6%, including one stillbirth and two early neonatal deaths. Compared to Lad et al., who reported higher NICU admissions (57.46%) and perinatal mortality(17.53%),our outcomes appear more favorable.Brands tetter et al. similarly observed lower Apgar scores and birth weights in placenta previa, consistent with our findings of 11% neonates with Apgar <7. The relatively better survival in our cohort may reflect timely intervention and neonatal intensive care support.

Placenta previa continues to be associated with significant maternal and perinatal morbidity, though mortality has markedly declined with advances in obstetric care. Our study corroborates the global literature in highlighting multi parity, prior caesarean delivery, and antepartum hemorrhage as major risk factors. Maternal complications remain

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dominated by hemorrhage and need for transfusion, while perinatal outcomes are chiefly influenced by prematurity and low birth weight. Comparisons with previous studies suggest that improved antenatal diagnosis, standardized surgical management, and neonatal care have contributed to better outcomes in recent years.

CONCLUSION

Placenta previa remains a high-risk obstetric condition associated with increased maternal morbidity and adverse perinatal outcomes, mainly due to hemorrhage and prematurity. Early diagnosis by ultrasonography, vigilant antenatal monitoring, and timely multidisciplinary intervention can significantly improve both maternal and neonatal prognosis.

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