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Original Research Article

Feto-Maternal Outcomes in Placenta Previa: A Clinical Study at Patna Medical College and Hospital in Patna

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Abstract:

Background: Placenta previa is a critical obstetric condition associated with significant risks to both the mother and fetus. It is characterized by abnormal implantation of the placenta over or near the cervical os, leading to complications such as antepartum hemorrhage, preterm delivery, and maternal morbidity. Understanding the clinical outcomes of placenta previa is essential for improving maternal and neonatal health.

Aim: This study aims to evaluate the feto-maternal outcomes in cases of placenta previa managed at the labor room of PMCH, Patna, focusing on maternal complications, neonatal outcomes, and associated risk factors.

Methods: A prospective observational study was conducted over 12 months (Feb 2024 to Jan 2025) including 100 cases of placenta previa admitted to the labor room. Data on maternal demographic characteristics, clinical presentation, management strategies, and maternal and neonatal outcomes were collected. Statistical analysis was performed to identify significant correlations between risk factors and outcomes.

Results: The study observed a high prevalence of antepartum hemorrhage (60%) and cesarean deliveries (96%) among placenta previa cases. Most common maternal complication was postpartum hemorrhage (33%). Neonatal outcomes showed a high rate of preterm deliveries (54%) and low birth weight (35%), with a perinatal mortality rate of 8%. Risk factors such as advanced maternal age, multiparity, and prior cesarean deliveries were significantly associated with adverse outcomes ($p < 0.05$).

Conclusion: Placenta previa poses substantial risks to maternal and neonatal health. Early diagnosis, close monitoring, and timely intervention are critical for improving outcomes. This study emphasizes the need for comprehensive antenatal care and risk stratification to manage placenta previa effectively.

Keywords: Placenta Previa, Feto-Maternal Outcomes, Antepartum Hemorrhage, Preterm Delivery, Cesarean Section, Perinatal Mortality, Tertiary Care, Maternal Morbidity.

Introduction

Placenta previa is a significant obstetric complication characterized by the abnormal implantation of the placenta in the lower uterine segment, either partially or completely covering the internal cervical os. It is a leading cause of antepartum hemorrhage, a condition that poses serious risks to both the mother and fetus [1]. The prevalence of placenta previa ranges from 0.3% to 0.5% of all pregnancies, with higher incidences reported among women with risk factors such as advanced maternal age, multiparity, prior cesarean deliveries, and a history of uterine surgeries or trauma [2].

The pathophysiology of placenta previa is attributed to defective decidual vascularization and scarring in the uterine lining, which disrupts normal placental implantation. Clinically, placenta previa manifests as painless vaginal bleeding in the second or third trimester, often necessitating hospitalization and emergency interventions. The severity of the condition depends on the extent of placental coverage over the cervical os and its association with additional complications, such as placenta accreta spectrum disorders [3, 4].

From a maternal perspective, placenta previa increases the risk of severe hemorrhage, necessitating blood transfusions, cesarean deliveries, and, in some cases, hysterectomy. Long-term complications include uterine rupture, infection, and impaired fertility [5]. For the fetus,

the condition is associated with adverse outcomes such as preterm delivery, low birth weight, intrauterine growth restriction (IUGR), and perinatal mortality. The financial and emotional burden on families and healthcare systems further underscores the critical need for effective management strategies [6].

Placenta previa is particularly challenging in low-resource settings, where delayed diagnosis and limited access to advanced healthcare facilities exacerbate maternal and neonatal risks [7]. Patna Medical College and Hospital (PMCH), a tertiary care center in Bihar, provides essential services for managing high-risk pregnancies, including placenta previa. However, data on the specific outcomes and risk factors associated with placenta previa in this region remain limited.

This study aims to address this gap by evaluating the feto-maternal outcomes of placenta previa cases admitted to the labor room of PMCH, Patna. By analyzing maternal complications, neonatal outcomes, and associated risk factors, this study seeks to provide actionable insights for optimizing antenatal care and perinatal management in similar healthcare settings. The findings will contribute to the growing body of evidence on placenta previa and inform clinical practices aimed at reducing maternal and neonatal morbidity and mortality.

Methodology

Study Design: This prospective observational study was conducted over a 12-month period from Feb 2024 to Jan 2025 to evaluate the feto-maternal outcomes of placenta previa cases admitted to the labor room of Department of Obstetrics and Gynaecology, Patna Medical College and Hospital (PMCH), Patna.

Study Population

- **Inclusion Criteria**:
    1. Pregnant women admitted to LRE, PMCH with ultrasonographic finding of placenta previa
    2. Pregnant women coming to LRE, PMCH with bleeding per vaginum who were diagnosed to be placenta previa on ultrasonography in labour room
    3. Gestational age of ≥28 weeks at the time of admission.
- **Exclusion Criteria:**
    1. Cases of abruptio placentae or other causes of antepartum hemorrhage.
    2. Women with multiple pregnancies.
    3. Cases who left against medical advice during conservative management

Sample Size: A total of 100 cases of placenta previa meeting the inclusion criteria were enrolled in the study.

Data Collection: Data were collected using a structured proforma that included:

1. **Maternal Demographics and Clinical Profile:** Age, parity, history of prior cesarean sections, history of uterine surgeries, and antenatal care received.
2. **Maternal Complications:** Antepartum hemorrhage, anemia, postpartum hemorrhage, need for blood transfusions, and surgical interventions.
3. **Neonatal Outcomes:** Gestational age at delivery, birth weight, Apgar scores, neonatal intensive care unit (NICU) admissions, and perinatal mortality.
4. **Risk Factors:** Smoking, advanced maternal age, and placenta accreta spectrum disorders.

Management Strategies

- All cases were managed as per institutional protocols, including close monitoring, blood transfusions, and elective or emergency cesarean deliveries depending on clinical presentation.
- Neonatal care included immediate resuscitation and NICU admission for preterm or low birth weight neonates.

Outcome Measures

1. **Primary Outcomes**:
    - Maternal: Incidence of antepartum hemorrhage, postpartum hemorrhage, anemia, and surgical interventions.
    - Neonatal: Gestational age at delivery, low birth weight (<2.5 kg), NICU admissions, and perinatal mortality.
2. **Secondary Outcomes:**
    - Association of risk factors with adverse maternal and neonatal outcomes.

Statistical Analysis

- Data were entered into Microsoft Excel and analyzed using SPSS software version 26.0.
- Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to summarize the data.
- Chi-square tests and logistic regression were performed to identify associations between risk factors and outcomes. A p-value of <0.05 was considered statistically significant.

Results

Summary of Findings: This study evaluated the feto-maternal outcomes of 100 cases of placenta previa admitted to the labor room at PMCH, Patna.

Key findings revealed that 60% of cases experienced antepartum hemorrhage, 96% underwent cesarean deliveries, and 32% had postpartum hemorrhage.. Neonatal outcomes showed a high prevalence of preterm deliveries (54%) and low birth weight (35%). Advanced maternal age, multiparity, and prior cesarean deliveries were significantly associated with adverse outcomes ($p < 0.05$).

Maternal Demographic Characteristics: Table 1 provides an overview of the maternal demographic characteristics of the study population.

Incidence

Table 1: Age

Age	Number	Percentage
<20 years	15	15%
20-30 years	48	48%
>30 years	37	37%

Table 2: Parity

Parity	Number	Percentage
Primigravida	22	22%
Multigravida	78	78%

Table 3: Period of gestation

Period of gestation	Number	Percentage
28-34 weeks	30	30%
34-37 weeks	24	24%
>37 weeks	46	46%

Table 4: History of previous cesarean section

History of previous C section	No. of cases	Percentage
Yes	42%	42%
No	58%	58%

Maternal Complications: Maternal complications were common, with a high incidence of antepartum hemorrhage and postpartum hemorrhage . Table 2 summarizes the key Maternal complications.

Table 5: Maternal Complications: Frequency of key maternal outcomes.

Complication	Frequency	Percentage (%)
Antepartum Hemorrhage	60	60%
Postpartum Hemorrhage	32	32%
Shock	14	14%
Bladder injury	5	5%
Transfusion related adverse reaction	8	8%
AKI	2	2%
Wound infection	6	6%
Maternal Mortality	2	2%

Neonatal Outcomes: Neonatal outcomes were significantly affected, with a high prevalence of preterm deliveries and low birth weight. Table 3 outlines the neonatal outcomes.

Table 6: Neonatal Outcomes: Key indicators of neonatal health at birth.

Outcome	Frequency	Percentage (%)
Preterm Deliveries (<37 weeks)	54	54%
Low Birth Weight (<2.5 kg)	35	35%
NICU Admissions	38	38%
Stillbirth	3	3%
Perinatal Mortality	8	8%

Mode of Delivery: Cesarean deliveries were predominant, with a small percentage of vaginal deliveries. Table 5 presents the mode of delivery.

Table 7: Mode of Delivery: Distribution of cesarean and vaginal deliveries.

Delivery Mode	Frequency	Percentage (%)
Cesarean Deliveries	96	96%
Vaginal Deliveries	4	4%

Table 8: Methods used to control PPH

Management of PPH	Frequency	Percentage (%)
Uterotonic drugs	32	32%
Compression sutures	15	15%
Systematic pelvic devascularisation	22	22%
Hysterectomy	5	5%

Maternal Hospital Stay: The length of maternal hospital stays varied based on complications and mode of delivery. Table summarizes the findings.

Table 9: Maternal Hospital Stay: Duration of hospitalization among placenta previa cases.

Length of Stay (Days)	Frequency	Percentage (%)
<5 Days	30	30
5–10 Days	50	50
>10 Days	20	20

Discussion

This study highlights the significant maternal and neonatal complications associated with placenta previa, a high-risk obstetric condition. With a prevalence of 100 cases observed over a year, this study provides critical insights into maternal morbidity, neonatal outcomes, and the risk factors influencing adverse events. Placenta previa remains a major contributor to maternal and perinatal morbidity and mortality, requiring prompt diagnosis and a multidisciplinary approach to management.

Risk factors: In this study, 37% of patients were of more than 30 years of age and 78% of patients were multigravida. 42% of cases had history of previous cesarean section. Risk factors for placenta previa include a history of advanced maternal age (age greater than 35 years old), multiparity, and history of cesarean section(s).[8]

Mode of delivery: In this study pregnancy complicated by placenta previa was terminated by LSCS in 96% of cases which is similar to that reported by Urmila et al (96.7%)(9)and higher than that reported by Sarojini et al (85.8%) (10). This is because only ultrasonography confirmed cases of placenta previa (covering os partially or completely were included in our study.

Management Challenges: The management of placenta previa requires meticulous planning and a multidisciplinary approach involving obstetricians, anesthesiologists, and neonatologists. Our findings underscore the critical role of antenatal care in identifying high-risk cases early and planning delivery at tertiary care centres equipped to handle emergencies. Timely cesarean delivery and availability of blood products are essential to optimize maternal and neonatal outcomes.

PPH occurred in 32% of cases. uterotonic drugs were given in all cases. Other conservative measures like compression sutures were applied in 15 cases while pelvic devascularisation (B/L uterine artery ligation, ovarian artey ligation, and descending cervical artery ligation) was done in 22 cases. Internal iliac artery ligation was done in one case. In 3% cases, hysterectomy was done as lifesaving procedure to control PPH. Placenta previa complicated by abnormally invasive placenta increases the risk of cesarean hysterectomy. Maternal mortality was 2% in our study.

Maternal Complications: Placenta previa was associated with substantial maternal morbidity, including antepartum hemorrhage (60%), postpartum hemorrhage (32%). A study by Fan D et al reports prevalence of 27.4% in placenta previa cases. [12] Other complications were hemorrhagic shock, bladder injury, acute kidney injury, transfusion related adverse events and surgical site infection. These complications align with global studies emphasizing the risk of severe hemorrhage in placenta previa.

Blood transfusion requirements were significant (35%), underscoring the importance of preoperative preparedness and the availability of blood products in tertiary care settings.

Neonatal Outcomes: Adverse neonatal outcomes were prevalent, with 54% of deliveries being preterm and 35% resulting in low birth weight neonates. The perinatal mortality rate of 8% highlights the critical challenges in managing neonates affected by prematurity, growth restriction,

and complications arising from antepartum hemorrhage. Study by NICU admissions (38%) were common, emphasizing the need for robust neonatal care infrastructure to improve survival rates and long- term outcomes. Other studies report similar rates of premature deliveries, Low birth weight, and perinatal mortality [9,11]

Recommendations

1. **Early Detection and Risk Stratification**:
    - Incorporate routine ultrasound screenings for placental location during antenatal care to identify cases of placenta previa early.
    - Implement risk stratification protocols based on maternal history, age, and previous cesarean deliveries.
2. **Strengthening Antenatal Care:**
    - Promote regular antenatal visits, particularly for high-risk groups, to monitor maternal and fetal well-being and prepare for potential complications.
3. **Comprehensive Delivery Planning:**
    - Ensure delivery at tertiary care centres with facilities for emergency cesarean sections, blood transfusions, and advanced neonatal care.
    - Conduct preoperative assessments to anticipate blood loss and arrange adequate blood reserves.
4. **Neonatal Care Improvements:**
    - Strengthen NICU facilities to manage preterm and low birth weight neonates effectively.
    - Develop protocols for timely resuscitation and management of neonatal complications.
5. **Public Health Interventions:**
    - Raise awareness about the risks associated with advanced maternal age, multiparity, and prior cesarean deliveries.
    - Implement community education programs on the importance of early antenatal registration and regular follow-ups.

Limitations: This study has certain limitations. Being conducted at a single tertiary care hospital, the findings may not fully represent the broader population, particularly in rural or under-resourced settings. Additionally, the sample size, though adequate for statistical analysis, may not capture the variability of outcomes in larger cohorts. Future research should aim for multicentre studies with larger sample sizes to validate these findings.

Conclusion

Placenta previa remains a high-risk condition with substantial maternal and neonatal complications. Early diagnosis, comprehensive antenatal care, and delivery planning at well-equipped centres are critical to improving outcomes. This study underscores the need for targeted interventions, robust healthcare infrastructure, and community awareness programs to address the challenges posed by placenta previa, particularly in resource-constrained settings like Bihar.

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