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A Retrospective Study of Fetomaternal Outcome In Placental Abruption - A Case Series

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HIGHLIGHTS

- Abruptio caused severe morbidity.
- Hypertension was major risk factor.
- Transfusions were universally required.
- Perinatal mortality remained high.
- Early diagnosis improved outcomes.

Key Words:

Placental abruption
Antepartum hemorrhage
Maternal outcome
Perinatal mortality
Hypertensive disorders of pregnancy

ABSTRACT

Introduction: Placental abruption is a significant obstetric emergency and a leading cause of antepartum hemorrhage, characterized by premature separation of the placenta from the uterine wall. It is associated with high maternal and perinatal morbidity and mortality, particularly in developing countries. This study aims to evaluate the fetomaternal outcomes in cases of placental abruption. **Aims & Objectives:** To evaluate the clinical presentation, risk factors, management, and fetomaternal outcomes in patients with placental abruption. **Material & Methods:** This retrospective case series was conducted at a tertiary care center over six months (January to June 2025). A total of nine pregnant women diagnosed with placental abruption were included. Clinical presentation, risk factors, management, and maternal and fetal outcomes were analyzed and summarized. **Results:** Most patients were aged 21–35 years. Hypertensive disorders of pregnancy and polyhydramnios were the most common risk factors. The predominant presenting symptoms included vaginal bleeding, abdominal pain, and decreased or absent fetal movements. Many patients had anemia, tachycardia, and elevated blood pressure. Emergency cesarean section was performed in cases with a live fetus, while vaginal delivery was preferred in stable patients with intrauterine fetal demise. Blood loss ranged from 1 to 2.5 liters, and all patients required blood transfusions. Maternal complications included postpartum hemorrhage, acute kidney injury, disseminated intravascular coagulation, and one case required peripartum hysterectomy. Perinatal outcomes were poor, with a high incidence of intrauterine fetal death and an overall mortality rate of 67%. **Conclusion:** The Placental abruption remains a life-threatening condition with significant adverse maternal and perinatal outcomes. Early diagnosis, timely referral, adequate antenatal care, and availability of blood transfusion services are crucial in improving the survival and reducing complications.



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INTRODUCTION

Placental abruption, also known as abruptio placentae, is a serious obstetric complication characterized by the premature separation of a normally implanted placenta from the uterine wall before delivery of the fetus. It remains one of the leading causes of antepartum hemorrhage and contributes significantly to maternal and perinatal morbidity and mortality worldwide. The condition presents as a clinical spectrum ranging from mild, asymptomatic separation to severe cases associated with catastrophic hemorrhage, disseminated intravascular coagulation (DIC), and fetal demise [1,2].

The reported incidence of placental abruption varies geographically, with approximately 0.5–1% in developed countries and up to 3–4% in developing regions. This disparity is largely attributed to differences in antenatal care, nutritional status, prevalence of hypertensive disorders, and accessibility to healthcare facilities. Despite advances in obstetric care, placental abruption continues to pose a significant challenge, particularly in low resource settings [3,4].

The pathophysiology involves bleeding into the decidua basalis, usually due to rupture of the uterine spiral arteries, leading to the formation of a retroplacental hematoma. This results in varying degrees of placental separation and compromised fetoplacental circulation. Clinically, placental abruption is classified into revealed, concealed, or mixed types. In revealed abruption, blood escapes through the cervix, while in concealed abruption, blood accumulates behind the placenta without visible vaginal bleeding, often leading to delayed diagnosis and worse outcomes [5,6].

Several risk factors have been identified, including hypertensive

disorders of pregnancy (such as preeclampsia and chronic hypertension), anemia, polyhydramnios, trauma, smoking, advanced maternal age, and previous history of abruption. Among these, hypertensive disorders remain the most significant and consistently reported association. Poor antenatal care and maternal malnutrition further exacerbate the risk, particularly in rural populations [7]. Clinically, patients typically present with vaginal bleeding, abdominal pain, uterine tenderness, and decreased or absent fetal movements. Maternal hemodynamic instability, tachycardia, & hypertension may also be present. In severe cases, complications such as hypovolemic shock, DIC, acute kidney injury (AKI), & postpartum hemorrhage (PPH) may occur. Fetal complications include intrauterine fetal demise (IUFD), preterm birth, low birth weight, and neonatal asphyxia [8,9].

Early diagnosis is primarily clinical, supported by ultrasound findings, although imaging may not always detect concealed hemorrhage. Prompt management is crucial and depends on the severity of abruption, gestational age, and maternal-fetal condition. Immediate delivery, often via emergency lower segment cesarean section (LSCS), is indicated in cases with live fetus and maternal instability, whereas vaginal delivery may be preferred in cases of IUFD with favorable conditions [10,11].

Given the high burden of adverse outcomes associated with placental abruption, especially in developing settings, it is essential to evaluate fetomaternal outcomes and identify modifiable risk factors. Retrospective studies provide valuable insights into clinical presentation, management patterns, and outcomes, helping to improve protocols and preparedness. Fetomaternal outcomes and complications related to placental abruption (Figure 1).

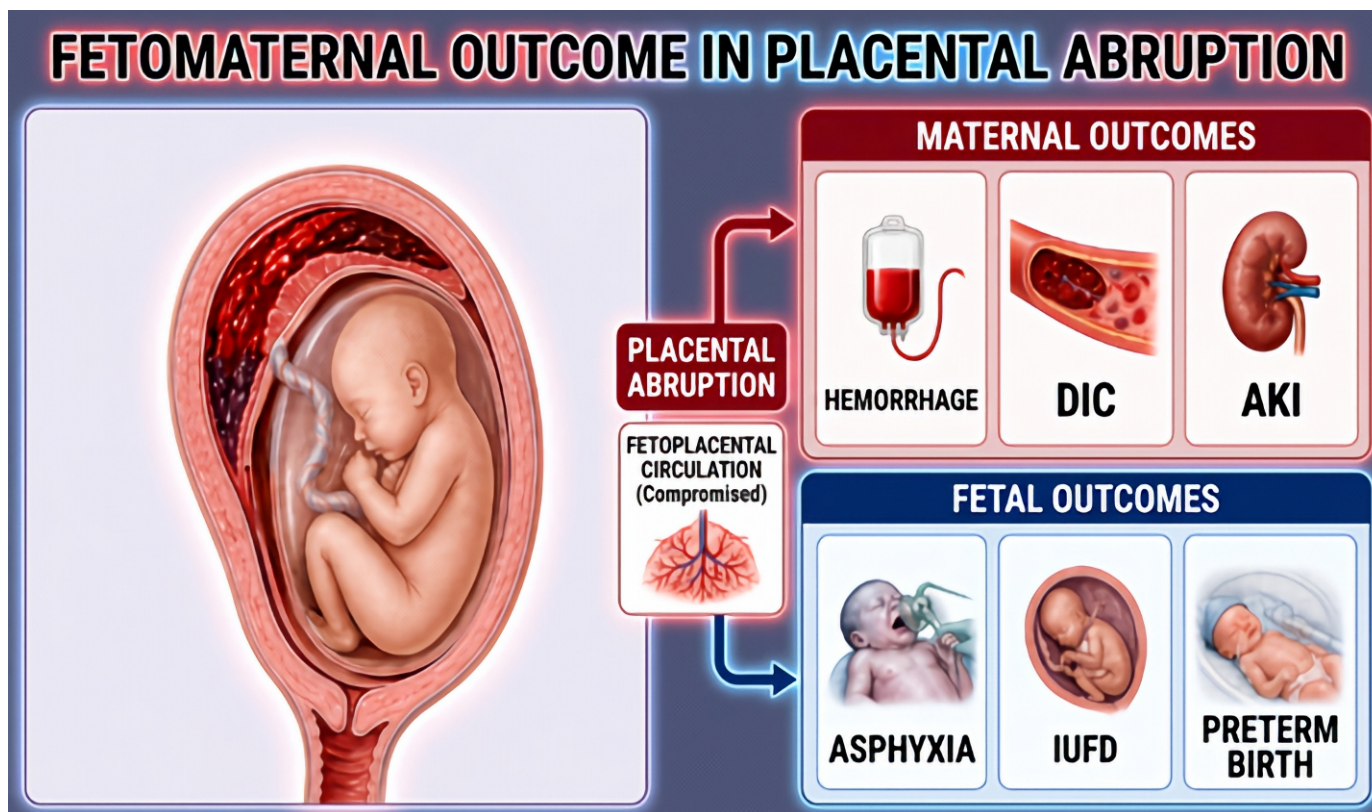


Figure 1: Schematic representation of fetomaternal outcomes and complications associated with placental abruption.

The present retrospective study aims to analyze the fetomaternal outcomes in cases of placental abruption managed at a tertiary care center. By examining clinical profiles, risk factors, management strategies, and outcomes, this study seeks to highlight key determinants of morbidity and mortality and emphasize the importance of timely intervention, multidisciplinary care, and improved antenatal surveillance in reducing adverse outcomes.

MATERIALS & METHODS

This case series study was conducted at a tertiary care centre, KIMS, koppal from January 2025 to June 2025. Ethical approval has been obtained from the Ethical Approval Committee of KIMS, koppal.

Study Population

This retrospective case series included nine pregnant women diagnosed with placental abruption. Women of varying ages, predominantly between 21 and 35 years, presenting with clinical features such as vaginal bleeding, abdominal pain, and altered fetal movements were considered. Cases with associated risk factors like hypertensive disorders and polyhydramnios were also included to assess fetomaternal outcomes in this study group.

Data Analysis

Data were analyzed descriptively and presented in tabular form, focusing on maternal and perinatal outcomes. Variables such as age distribution, risk factors, clinical presentation, mode of delivery, complications, and transfusion requirements were examined. Frequencies and proportions were used to summarize findings, including incidence of postpartum hemorrhage, ICU admission, and perinatal mortality. Comparative statistical tests were not applied due to small sample size, and results were interpreted based on observed clinical patterns overall.

RESULTS

A retrospective study of fetomaternal outcome in placental abruption showed that most cases occurred in women aged between 21 and 35 years, with a total study size of 9 cases included in the analysis. Placental abruption identified several associated risk factors, with hypertensive disorders of pregnancy

ved, while anemia was present in most patients. Thrombocytopenia was seen in some cases, and coagulopathy was noted in selected patients (**Figure 2**). Placental abruption showed that the most common presenting complaint was per vaginal bleeding, with abdominal pain also frequently reported. Many patients presented with decreased or absent fetal movements, and the duration of symptoms ranged from 30 minutes to 5 hours and 40 minutes. Increased blood pressure was observed in the majority of cases, and tachycardia was a common clinical finding (**Table 1**). Placental abruption indicated that management was tailored according to the clinical condition, with cases involving a live fetus and unstable maternal or fetal status managed by emergency lower segment cesarean section (LSCS), while stable patients with intrauterine fetal death (IUFD) and a favorable cervix were managed by vaginal delivery (**Table 2**). Placental abruption showed that estimated blood loss ranged from 1 to 2.5 liters, with retroplacental clots observed in all cases. All patients required packed red blood cell (PRBC) transfusion, and additional transfusions such as random donor platelets (RDP) and fresh frozen plasma (FFP) were administered in cases complicated by coagulopathy (**Table 3**). Postpartum hemorrhage was observed in all patients, while acute kidney injury occurred in some cases. Severe cases required ICU admission, and prolonged hospital stay was common. One case required peripartum hysterectomy, while shock and disseminated intravascular coagulation were reported in one to two cases each. Despite these complications, all mothers were eventually discharged with supportive care (**Table 4**). Intrauterine fetal death was the most frequent perinatal outcome, while preterm live births often required neonatal intensive care. The overall perinatal mortality rate was found to be 67 percent (**Table 5**). Placental abruption demonstrated that cases with severe abruption and instability were associated with high maternal morbidity, including postpartum hemorrhage, need for ICU care, and blood transfusion, with intrauterine fetal death being common. Moderate cases managed with timely intervention and transfusion support showed the possibility of preterm survival, while stable cases with intrauterine fetal death were associated with favorable maternal recovery despite fetal loss (**Table 6**).

Table 1: Clinical Presentation

Symptom / Sign	Description
PV bleeding	Most common presenting complaint
Abdominal pain	Frequently reported
Decreased/absent fetal movement	Common presentation
Duration of symptoms	30 minutes to 5 hours 40 minutes
Increased BP	Seen in majority
Tachycardia	Common finding

Table 2: Case-Based Management Approach

Case Type / Condition	Management Approach
Live fetus with unstable condition	Emergency LSCS
Stable patient with IUFD + favorable cervix	Vaginal delivery

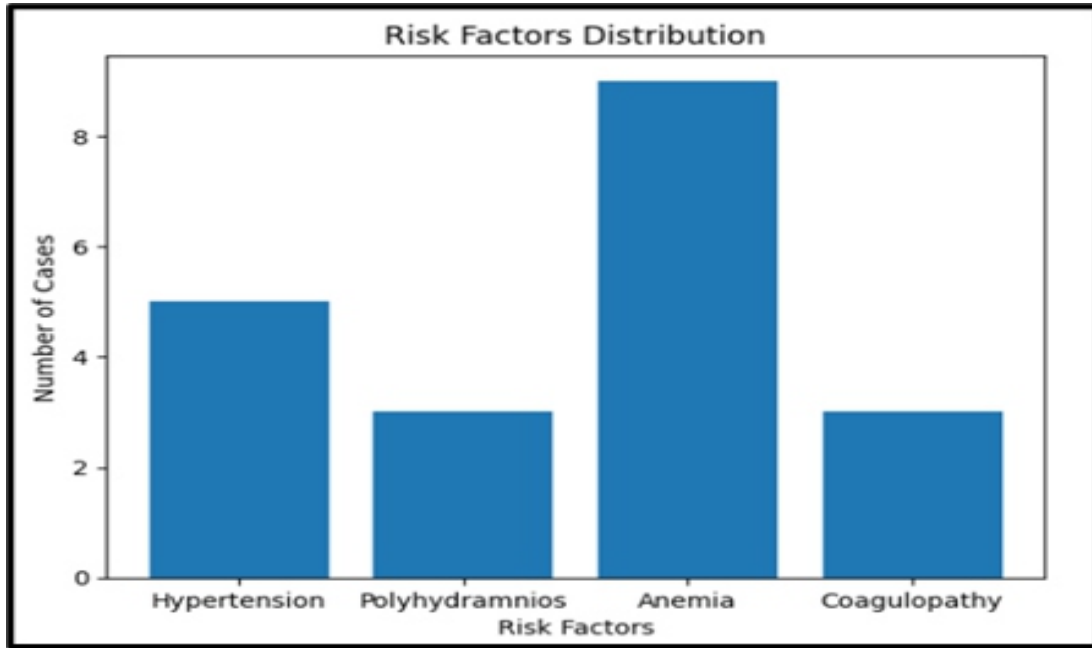


Figure 2: Risk Factors Associated with Placental Abruptio

Table 3: Intraoperative & Hematological Findings

Parameter	Observation
Estimated blood loss	1–2.5 liters
Retroplacental clot	Seen in all cases
Blood transfusion	PRBC required in all patients
Additional transfusion	RDP & FFP in coagulopathy cases

Table 4: Maternal Outcomes (Case-wise Complications)

Maternal Outcome / Case Type	Description
Postpartum hemorrhage (PPH)	Seen in all patients
Acute Kidney Injury (AKI)	Observed in some cases
ICU admission	Required in severe cases
Prolonged hospital stay	Common
Peripartum hysterectomy	1 case
Shock	1–2 cases
Disseminated Intravascular Coagulation (DIC)	1–2 cases
Final outcome	All mothers discharged with supportive care

Table 5: Perinatal Outcomes (Case Distribution)

Outcome Type	Description
Intrauterine fetal death (IUFD)	Most frequent outcome
Preterm live birth	Required NICU care
Perinatal mortality rate	67%

Table 6: Summary of Case Outcome Patterns

Case Category	Maternal Outcome	Fetal Outcome
Severe abruptio + instability	High morbidity (PPH, ICU, transfusion)	IUFD common
Moderate cases with intervention	Managed with transfusion support	Preterm survival possible
Stable IUFD cases	Favorable maternal recovery	Fetal loss

DISCUSSION

Placental abruption remains a life-threatening obstetric emergency with significant implications for both maternal and fetal outcomes. **Ananth CV, et. al; 1996**, highlighted the strong association between hypertensive disorders of pregnancy and the occurrence of placental abruption. In this study, the majority of patients belonged to the age group of 21–35 years, which corresponds to the peak reproductive age, similar to observations in other developing country settings [13,14].

Hypertensive disorders emerged as the most prominent risk factor, reinforcing the pathophysiological role of vascular compromise and endothelial dysfunction in the development of abruption. Polyhydramnios and anemia were also noted as contributing factors, with anemia being highly prevalent among the study population. Maternal anemia not only predisposes to poor placental perfusion but also worsens outcomes in the event of hemorrhage, thereby increasing the need for transfusion and critical care [15,16].

The clinical presentation in this study was typical, with vaginal bleeding, abdominal pain, and decreased fetal movements being the most common symptoms. However, the variability in the duration of symptoms from as early as 30 minutes to several hours emphasizes the unpredictable nature of the condition and the importance of early recognition. The presence of hypertension and tachycardia in most patients indicates significant maternal hemodynamic stress at presentation [17].

Spahn DR & Rossaint R. 2005, supported the severity of the condition, with widespread anemia and occasional thrombocytopenia and coagulopathy. These findings are indicative of ongoing blood loss and consumptive coagulopathy, particularly in severe cases. The universal requirement for blood transfusion in this study underscores the critical need for readily available blood products in managing such emergencies [18].

Management strategies were largely dictated by fetal viability and maternal condition. Emergency cesarean section was performed in all cases with a live fetus or maternal instability, aligning with standard obstetric guidelines. Vaginal delivery was reserved for cases of intrauterine fetal demise with favorable cervical conditions. The presence of retroplacental clots in all cases confirms the diagnosis and reflects the severity of placental separation [19,20].

Maternal outcomes in this study were marked by a high incidence of postpartum hemorrhage, which was observed in all patients. This is consistent with the known association between placental abruption and uterine atony or coagulopathy. Other complications such as acute kidney injury, ICU admission, and prolonged hospitalization further highlight the systemic impact of the condition. The occurrence of peripartum hysterectomy in one case indicates the severity of hemorrhage and the need for life-saving surgical intervention. Despite these complications, the absence of maternal mortality suggests effective management and timely intervention at the tertiary care center [21].

Perinatal outcomes, however, remained poor, with a high incidence of intrauterine fetal demise and an overall perinatal mortality rate of 67%. This is comparable to other studies conducted in similar settings, where delayed presentation and limited antenatal surveillance contribute to adverse fetal outcomes. Preterm live births requiring neonatal intensive care further emphasize the burden on neonatal services and the long-term implications for infant health [22].

The disparity between maternal and fetal outcomes in this study reflects the relative success in managing maternal complications compared to fetal salvage, which is highly dependent on early diagnosis and intervention. Delayed referral and presentation remain critical barriers to improving perinatal outcomes [23].

Corso KJ & Robertson S. 2015, underscored the importance of early risk identification, particularly among women with hypertensive disorders and anemia. Strengthening antenatal care services, improving awareness, ensuring timely referral, and maintaining adequate blood bank facilities are essential measures to reduce the burden of placental abruption. A multidisciplinary approach involving obstetricians, anesthesiologists, intensivists, and neonatologists is crucial for optimizing both maternal and fetal outcomes [24].

CONCLUSION

Abruptio placenta is one of the most serious hemorrhagic complications of pregnancy and contributes significantly to high maternal and perinatal mortality and morbidity. Factors predicting adverse maternal outcomes include malnutrition, anemia, preeclampsia, inadequate antenatal care, postpartum hemorrhage, disseminated intravascular coagulation, and maternal shock. Predictors of perinatal death include low birth weight, preterm delivery, birth asphyxia, low APGAR scores, and delayed intervention. Improving awareness about antenatal care, ensuring good nutritional status, enabling prompt diagnosis, early intervention, and strengthening institutional preparedness with adequate blood and blood products can greatly enhance maternal and fetal survival outcomes.

LIMITATIONS & FUTURE PERSPECTIVES

The study's limitations include a single-centre setting, a relatively small sample size, and a short study duration, which may limit the broader applicability of the results. Future studies should incorporate multicentre designs with larger populations to enhance validity, assess long-term outcomes, and investigate advanced diagnostic & management approaches. Such efforts will improve overall patient care and help minimize complications.

CLINICAL SIGNIFICANCE

The clinical significance of this study lies in its potential to bridge the gap between research findings and practical healthcare applications. It emphasizes the importance of translating scientific observations into meaningful improvements in patient

care, diagnosis, and treatment outcomes. By highlighting real-world relevance, the study contributes to evidence-based medical practice and supports informed clinical decision-making. Ultimately, the findings aim to enhance patient quality of life, optimize therapeutic strategies, and promote better disease management in clinical settings.

ABBREVIATIONS

PPH: Postpartum Hemorrhage

AKI: Acute Kidney Injury

IUFD: Intrauterine Fetal Death

LSCS: Lower Segment Cesarean Section

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AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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All necessary consent & approval was obtained by authors.

CONSENT FOR PUBLICATION

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DATA AVAILABILITY

All data generated and analyzed are included within this research article. The datasets utilized and/or analyzed in this study can be obtained from the corresponding author upon a reasonable request.

USE OF ARTIFICIAL INTELLIGENCE (AI) & LARGE LANGUAGE MODEL (LLM)

The authors confirm that no AI & LLM tools were used in the writing or editing of the manuscript, and no images were altered or manipulated using AI & LLM.


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This article serves as an important educational tool for the scientific community, offering insights that may inspire future research directions. However, they should not be relied upon independently when making treatment decisions or developing public health policies.

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