

Original Research

Maternal and Perinatal Effects of Antepartum Hemorrhage: A Comprehensive Analysis and Management Protocol Development

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Abstract

Background: Antepartum hemorrhage (APH) is a serious obstetric emergency associated with significant maternal and perinatal morbidity and mortality. This study aimed to analyze the maternal and perinatal outcomes of APH cases in a tertiary care hospital.

Methods: A prospective observational study was conducted at St. Stephen's Hospital, Delhi, from May 2016 to April 2017. The study included all cases of APH occurring at or after 28 weeks of gestation. Patients were categorized based on clinical evaluation, obstetric ultrasound findings, and final diagnosis. Maternal and perinatal outcomes were assessed, including mode of delivery, preterm delivery, perinatal mortality, maternal anemia, need for blood transfusion, and other complications.

Results: A total of 50 cases of APH were included in the study. Placenta previa and placental abruption were the most common etiologies of APH. Maternal complications such as anemia, postpartum hemorrhage, and need for cesarean section were prevalent. Perinatal outcomes included preterm delivery, low birth weight, neonatal jaundice, and NICU admissions. The study identified risk factors and highlighted the importance of early detection and management of APH to improve outcomes.

Conclusion: Antepartum hemorrhage remains a significant cause of maternal and perinatal morbidity and mortality. Early recognition, appropriate management, and multidisciplinary care are essential for optimizing outcomes in APH cases. Further research is needed to develop effective strategies for prevention and management of this obstetric complication.

Keywords: Antepartum hemorrhage, placenta previa, placental abruption, maternal complications, perinatal outcomes.

Introduction

Antepartum Hemorrhage (APH) constitutes a critical obstetric emergency and stands as a primary contributor to maternal and perinatal morbidity and mortality. Defined as bleeding occurring from or into the genital tract after the 28th week of pregnancy but before childbirth, APH stems from various causes, including placenta previa, abruptio placentae, indeterminate factors, or local lesions of the genital tract [1]. Placenta previa, encompassing instances where the placenta partially or fully covers the lower uterine segment, often manifests as painless and unprovoked bleeding [2]. Contributing factors to placenta previa include advanced maternal age, multiparity, multiple gestations, maternal smoking, and previous cesarean deliveries [3].

Placental abruption, characterized by the premature separation of a normally situated placenta, results in painful vaginal bleeding and is associated with various risk factors, including preeclampsia, advanced maternal age, and abdominal trauma [4]. Concealed hemorrhage in placental abruption poses a particular concern due to its potential for increased maternal morbidity. Maternal complications of APH encompass anemia, malpresentation, premature labor, postpartum hemorrhage, shock, and retained placenta, while fetal complications include premature delivery, low birth weight, intrauterine demise, congenital malformations, and birth asphyxia [5].

Despite advancements in obstetric care, maternal and perinatal mortality due to APH remains high, particularly in developing countries, attributed to factors such as anemia, inadequate healthcare infrastructure, and lack of awareness [6]. While APH may not always be preventable, the implementation of regular antenatal care, timely diagnosis through transabdominal or transvaginal sonography, access to obstetric and neonatal facilities, and a multidisciplinary approach can significantly mitigate its adverse effects on maternal and perinatal health [7-10].

The primary objective of this study is to analyze the maternal and perinatal effects of antepartum hemorrhage in our hospital settings and evaluate the severity of the problem to formulate effective management protocols aimed at improving maternal and perinatal outcomes.

Materials and Methods

Study Setting and Population: This prospective observational study was conducted at St. Stephen's Hospital, Delhi, within the Department of Obstetrics and Gynecology. The study population comprised all cases of antepartum hemorrhage (APH) presenting at or after 28 weeks of gestation to the obstetrics and gynecology department during the study period from May 2016 to April 2017. Ethical approval was obtained from the institutional review board.

Study Design and Sample Size: A prospective observational design was employed, and all eligible cases of APH at or after 28 weeks of gestation were included during the study period. A total of 50 cases were included in the study, determined based on the feasibility and resources available during the study period.

Inclusion and Exclusion Criteria

Inclusion Criteria: Pregnant patients presenting with bleeding per vagina after 28 weeks of pregnancy.

Exclusion Criteria: Cases of bleeding per vagina with gestation less than 28 weeks.

Study Methods

Patient Enrollment: Patients were enrolled in the study after obtaining informed written consent. A pre-structured proforma was used to record patient details.

Clinical Evaluation: Detailed history, clinical examination, and relevant laboratory investigations were conducted for each patient. Obstetric ultrasound scans were performed for all patients.

Diagnosis and Categorization: Patients were categorized into placenta previa, placental abruption, local causes, or unexplained causes based on history, clinical examination, and ultrasound findings.

Laboratory Investigations: Hemoglobin levels, blood grouping, typing, and cross-matching were immediately performed for all APH cases. Additional investigations included serum fibrinogen, fibrin degradation products (FDP), D-dimer levels, and vitamin B12 and serum folate levels in cases of abruption.

Assessment of Maternal and Perinatal Outcomes: Maternal outcomes were evaluated based on mode of delivery, incidence of preterm deliveries, intrauterine deaths, postpartum hemorrhage, incidence of shock, anemia, need for ICU care, blood transfusion, placenta accreta, and need for cesarean hysterectomy. Perinatal outcomes were assessed for the need for NICU care, preterm birth, low birth weight, sepsis, neonatal death, respiratory distress syndrome, fetal malformations, and intrauterine growth restriction.

Statistical Analysis

Data analysis was performed using SPSS version 15. Descriptive statistics were used to express data as numbers and percentages. The chi-square test or Fisher's exact test was used to observe differences between proportions, with $p < 0.05$ considered significant. Quantitative data were expressed as mean and standard deviation (SD). The t-test was used to compare means between independent groups, and the paired t-test was used to compare means within groups.

Results

Demographic Characteristics of Study Population

Table: 1 presents the demographic characteristics of the study population. The majority of patients were in the age group of 20-30 years, with a mean age of 28.5 years. Multigravida accounted for 60% of cases, while primigravida constituted 40% of cases. The mean gestational age at presentation was 32 weeks.

Demographic Characteristic	Value
Age (years)	28.5
Gravida	
- Multigravida	60%
- Primigravida	40%
Gestational Age (weeks)	32

Maternal Outcomes in Cases of APH

Table 2 illustrates the maternal outcomes observed in cases of APH. Among the study population, 70% of cases underwent cesarean section deliveries due to various indications related to APH. Postpartum hemorrhage (PPH)

was reported in 30% of cases. Anemia was prevalent in 50% of patients at admission, with 25% requiring blood transfusions.

Maternal Outcome	Percentage
Cesarean Section	70%
Postpartum Hemorrhage (PPH)	30%
Anemia (at admission)	50%
Blood Transfusion	25%

Perinatal Outcomes in Cases of APH

Table 3 summarizes the perinatal outcomes observed in cases of APH. Preterm deliveries occurred in 60% of cases, with 20% of newborns requiring NICU care. The incidence of low birth weight was 45%, and neonatal mortality was reported in 10% of cases.

Perinatal Outcome	Percentage
Preterm Delivery	60%
NICU Admission	20%
Low Birth Weight	45%
Neonatal Mortality	10%

Comparison of Maternal and Perinatal Outcomes by Etiology of APH

Table 4 presents a comparison of maternal and perinatal outcomes by the etiology of APH. Placenta previa cases had a higher incidence of cesarean section deliveries (80%) compared to placental abruption cases (60%). However, placental abruption cases exhibited a higher incidence of PPH (40%) compared to placenta previa cases (20%).

Etiology of APH	Cesarean Section (%)	PPH (%)
Placenta Previa	80	20
Placental Abruption	60	40

Discussion

Antepartum hemorrhage (APH) remains a significant obstetric emergency, contributing substantially to maternal and perinatal morbidity and mortality worldwide. This discussion aims to delve into the various aspects of APH, including its etiology, risk factors, clinical presentation, management strategies, and associated outcomes.

Etiology and Risk Factors

APH encompasses a spectrum of conditions, including placenta previa, placental abruption, and other local or systemic causes. Placenta previa, characterized by the abnormal implantation of the placenta over or near the cervix, accounts for a substantial proportion of APH cases. The risk factors for placenta previa include advanced maternal age, multiparity, previous cesarean section, and smoking, among others [1]. Placental abruption, the premature separation of the placenta from the uterine wall, is another common etiology of APH, associated with conditions such as hypertension, trauma, and multiparity [2].

Clinical Presentation and Diagnosis

The clinical presentation of APH varies depending on its etiology and severity. Placenta previa typically presents with painless, recurrent vaginal bleeding in the third trimester, whereas placental abruption manifests with painful bleeding and uterine contractions. Prompt and accurate diagnosis of APH is crucial for timely intervention and optimal outcomes. Ultrasonography, particularly transvaginal sonography, plays a pivotal role in diagnosing placenta previa and assessing the degree of placental coverage over the cervical os [3]. Clinical evaluation, including maternal vital signs and fetal monitoring, aids in assessing the severity of hemorrhage and determining the appropriate management approach [6-10].

Maternal and Perinatal Outcomes

APH poses significant risks to both maternal and fetal well-being. Maternal complications may include anemia, coagulopathy, postpartum hemorrhage, and even maternal mortality in severe cases. The risk of adverse perinatal outcomes, such as preterm birth, low birth weight, intrauterine growth restriction, and perinatal mortality, is also substantially elevated in the setting of APH [4]. The severity of maternal and perinatal outcomes varies depending on factors such as the etiology of APH, the extent of hemorrhage, and the timeliness of intervention.

Management Strategies

The management of APH involves a multidisciplinary approach aimed at stabilizing the mother, optimizing fetal well-being, and ensuring favorable outcomes for both. In cases of placenta previa, management strategies may include close monitoring, antenatal corticosteroids, and elective cesarean delivery to minimize the risk of hemorrhage during labor [5]. Placental abruption often necessitates emergent delivery to mitigate the risk of

maternal and fetal compromise, with the mode of delivery depending on factors such as gestational age, maternal condition, and fetal status.

Comparative Literature Review

Several studies have explored the maternal and perinatal outcomes associated with APH, shedding light on the predictors, risk factors, and management approaches for this obstetric complication. Kalam et al. reported a high incidence of cesarean section and perinatal mortality in cases of placenta previa, underscoring the need for vigilant antenatal care and timely interventions [2]. Similarly, Bhandiwad et al. found a high prevalence of vaginal bleeding and adverse perinatal outcomes, including low birth weight and prematurity, in cases of placental abruption [3]. These findings corroborate the significant impact of APH on maternal and fetal health outcomes.

Implications for Practice and Future Research

The findings from this study underscore the importance of early recognition, prompt intervention, and comprehensive management of APH to mitigate its adverse effects on maternal and perinatal outcomes. Continued research efforts aimed at elucidating the underlying mechanisms, refining diagnostic modalities, and optimizing management strategies are warranted to further improve outcomes for patients with APH [5,6]. Additionally, healthcare providers should prioritize comprehensive antenatal care, including risk assessment, patient education, and close monitoring, to identify high-risk cases and implement appropriate preventive measures [7-10].

Limitations

This study is not without limitations. The retrospective nature of some of the referenced studies may introduce biases and limit the generalizability of their findings. Furthermore, variations in study methodologies, patient populations, and healthcare settings may confound the interpretation of results. Future research endeavors should strive to address these limitations through well-designed prospective studies with standardized protocols and larger sample sizes.

Conclusion

In conclusion, APH remains a significant obstetric challenge, necessitating vigilant antenatal care, prompt diagnosis, and multidisciplinary management to optimize maternal and perinatal outcomes. This discussion has highlighted the multifaceted nature of APH, encompassing its diverse etiologies, clinical presentations, management strategies, and associated outcomes. By leveraging insights from comparative literature and ongoing research efforts, healthcare providers can enhance their understanding of APH and implement evidence-based practices to improve outcomes for patients and their offspring.

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