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Original Article

Perinatal And Maternal Outcomes In Antepartum Haemorrhage: A Prospective Study At A Teaching Institute

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ABSTRACT

Objective: To evaluate perinatal and maternal outcomes in antepartum haemorrhage (APH) cases, focusing on causes, management strategies, and their impact at a teaching institute.

Methods: A prospective cohort study was conducted at a tertiary care centre, enrolling 112 APH cases over a one-year period in SIMS Medical College from October 2023 to September 2024. Data were collected on maternal demographics, clinical presentation, management, and outcomes using a standardized proforma. Inclusion criteria included singleton pregnancies with bleeding after 28 weeks gestation. Causes (placenta previa, abruptio placentae, unclassified) were identified via ultrasonography. MRI done to exclude adherent placenta which needs multi disciplinary approach for management. Statistical analysis involved descriptive statistics and chi-square tests for categorical variables.

Results: APH incidence was 1.15%, with abruptio placentae (46.43%), placenta previa (42.86%), and unclassified haemorrhage (10.7%) as primary causes. Maternal complications included postpartum haemorrhage (33.0%) and anaemia (40.18%); perinatal mortality was 60 per 1000 births. Caesarean delivery was required in 82.1% of placenta previa cases. Major placenta previa was associated with higher haemorrhage risk **(OR 3.18, 95% CI 1.22-8.33, p=0.017).**

Conclusion: APH remains a significant obstetric challenge, with placenta previa and abruptio placentae contributing to substantial morbidity. Early diagnosis via ultrasonography and aggressive management reduced adverse outcomes, though perinatal mortality remains high.

Keywords*: Antepartum haemorrhage, placenta previa, abruptio placentae, maternal mortality, perinatal outcome.*

INTRODUCTION

Antepartum haemorrhage (APH), defined as bleeding from or into the genital tract after the period of viability (20 weeks in the US, 22 in Malaysia, 24 in the UK, 28 in India) but before the end of the second stage of labour, is a critical obstetric emergency (Williams 2010). It complicates 2-5% of pregnancies and is a leading cause of maternal and perinatal morbidity and mortality worldwide (CDC 2015, Ananth 1996). Historically, APH has been feared due to its potential for severe complications, as noted by William Hunter (1718-1783), who described it as one of the most alarming obstetric emergencies alongside convulsions (Hunter 1783). In developing countries like India, where maternal mortality rates reach 4.08 per 1000 live births, APH contributes significantly to adverse outcomes due to factors such as pre-existing anaemia, limited medical facilities, and delayed access to care (Das 1975).

The primary causes of APH include placenta previa (0.33-0.55% of pregnancies), abruptio placentae (0.5-1%), and unclassified or local causes, each accounting for roughly one-third of cases (Crane 1999, Frederiksen 1999, Arora 2000). Placenta previa, where the placenta implants wholly or partially in the lower uterine segment, is classified into four types based on its proximity to the internal cervical os (Dewhurst 1957).

Placenta previa is used to describe a placenta that is implanted over or very near the internal cervical os. There are several possibilities:

- Total placenta previa the internal os is covered completely by placenta.
- Partial placenta previa the internal os is partially covered by placenta.
- Marginal placenta previa the edge of the placenta is at the margin of the internal os.
- Low-lying placenta the placenta is implanted in the lower uterine segment such that the placental edge does not reach the internal os, but is in close proximity to it.

Abruptio placentae involves premature separation of a normally situated placenta, leading to bleeding that may be concealed or revealed (Ananth 1999). Unclassified causes include cervical polyps, carcinoma, or trauma (Williams 2010).

Maternal complications of APH include malpresentation, premature labour, postpartum haemorrhage, sepsis, shock, and retained placenta, while fetal complications encompass prematurity, low birth weight, intrauterine death, congenital malformations, and birth asphyxia (CDC 2015). In developed countries, maternal mortality from APH has decreased to approximately 6 per 100,000 live births due to improved obstetric care, including ultrasonography for placental localisation, advanced anaesthetic techniques, and neonatal intensive care (Crane 1999). However, in India, perinatal mortality remains high at 60 per 1000 births, reflecting challenges in resource-limited settings (Das 1975).

Risk factors for placenta previa include multiparity, advanced maternal age (>35 years), prior caesarean delivery, and smoking, with studies showing a 2-9 fold increased risk in older multiparous women (Ananth 1996, Parazzini 1991, Chelmow 1996). Previous caesarean sections increase the risk of placenta previa by 47-100% in subsequent pregnancies (Getahun 2006, Yang 2007). Abruptio placentae is associated with hypertension, smoking, and trauma, with a meta-analysis indicating a 2.3-fold increased risk in smokers (Ananth 1999b). These risk factors underscore the need for vigilant antenatal care.

The pathophysiology of placenta previa involves implantation in the lower uterine segment, where dilation during pregnancy shears the placenta, opening uteroplacental vessels (Williams 2010). Theories for low implantation include defective decidual vascularisation, dropping down of the ovum, or large placental surface area in multiple gestations (Williams 2010). Abruptio placentae results from vascular disruption, often linked to chronic hypertension or inflammatory changes (Ananth 2007). Diagnostic advances, particularly transvaginal ultrasonography, have improved detection accuracy to 98%, reducing reliance on risky digital examinations (Timor 1993, Smith 1997).
Management strategies have evolved, with expectant management for preterm cases and immediate delivery for severe haemorrhage (Cotton 1980). Tocolytics like magnesium sulphate are used cautiously to prolong pregnancy, though their efficacy remains debated (Sharma 2004). Caesarean delivery is nearly universal for placenta previa, with techniques like haemostatic suturing or arterial ligation employed to control bleeding (Cho 2000). Despite these advances, APH remains a significant challenge in developing countries, necessitating studies to evaluate current practices and outcomes.
This study aims to assess the perinatal and maternal outcomes of APH at a teaching institute serving urban and rural populations in India, focusing on causes, management effectiveness, and areas for improvement in obstetric care through a prospective approach.

AIMS

The objectives of this study were to:

1. Emphasize the importance of antenatal registration and timely admission for improved obstetric care in APH.
2. Assess the effectiveness of current obstetric practices in managing APH.
3. Determine the causes of APH, including placenta previa, abruptio placentae, and unclassified haemorrhage.
4. Evaluate the impact of early diagnosis and prompt treatment on maternal and perinatal outcomes.
5. Compare outcomes between accidental haemorrhage (abruptio placentae) and placenta previa.
6. Identify shortcomings in current practices to inform improvements in obstetric services.

MATERIALS AND METHODS

Study Design and Setting

A prospective cohort study was conducted at a tertiary care teaching institute in India, Shimoga Institute of Medical Science, Shivamogga catering to both urban and rural populations, over a one-year period from October 2023 to September 2024. The institute is equipped with advanced obstetric and neonatal facilities, including ultrasonography, MRI and intensive care units.

Study Population

The study enrolled 112 women with singleton pregnancies presenting with APH, defined as vaginal bleeding after 28 weeks gestation but before delivery. Inclusion criteria comprised confirmed APH via clinical assessment and ultrasonography at the time of presentation. Exclusion criteria included multiple gestations, bleeding before 28 weeks, or

inability to provide informed consent. Participants were consecutively enrolled upon diagnosis of APH during the study period.

Data Collection

Data were collected prospectively using a standardized proforma (Annexure I) capturing maternal demographics (age, parity, socioeconomic status), clinical presentation (gestational age at bleeding, number of episodes, associated pain), diagnostic findings (ultrasonography for placental localisation, retroplacental clots), management details (expectant vs. immediate delivery, mode of delivery), and outcomes (maternal complications, perinatal mortality, birth weight). Investigations included haemoglobin levels, blood grouping, and urine analysis. Ultrasonography (transabdominal or transvaginal) was performed at presentation to confirm the cause of bleeding (placenta previa, abruptio placentae, or unclassified). MRI was done for previous LSCS with the praevia to rule out adherent placenta. Informed consent was obtained from all participants at enrolment.

Management Protocol

Upon presentation, patients underwent immediate assessment for blood loss (via pallor, pulse, blood pressure), with blood samples taken for grouping, cross-matching, and haemoglobin estimation. Normal saline infusion was initiated, and compatible blood was arranged. Gentle abdominal palpation assessed uterine tenderness, and fetal heart rate was monitored. Diagnosis was confirmed by history, physical examination, and ultrasonography. Treatment was tailored based on maternal condition, fetal maturity, and neonatal unit capacity. Expectant management was employed for preterm fetuses without active bleeding, with regular monitoring of maternal and fetal status. Severe haemorrhage or mature fetuses prompted immediate delivery, typically via caesarean section. Follow-up data were collected until discharge or 6 weeks postpartum.

Statistical Analysis

Data were analyzed using descriptive statistics (means, percentages) for continuous and categorical variables. Chi-square tests compared outcomes between placenta previa and abruptio placentae groups, with odds ratios (OR) and 95% confidence intervals (CI) calculated for significant associations. A p-value <0.05 was considered statistically significant. Analysis was performed using SPSS version 10.0.

RESULTS

The study enrolled 112 cases of APH among 7206 deliveries, yielding an incidence of 1.15%. The causes were abruptio placentae (52 cases, 46.43%), placenta previa (48 cases, 42.86%), and unclassified haemorrhage (12 cases, 10.7%). Maternal age ranged from 18 to 42 years (mean 27.3 years), with 62.5% being multiparous. Gestational age at presentation varied from 28 to 40 weeks (mean 34 weeks).

Table 1 summarizes the causes of APH and their distribution. Abruptio placentae was the most common cause.

Table 1: Distribution of Causes of Antepartum Haemorrhage (n=112)

Cause	Number of Cases	Percentage (%)
Abruptio Placentae	52	46.43
Placenta Previa	48	42.86
Unclassified Haemorrhage	12	10.71

Table 2 details maternal characteristics. Multiparous women and those over 35 years had a higher incidence of placenta previa (p=0.021). Previous caesarean delivery was noted in 19.2% of placenta previa cases.

Table 2: Maternal Characteristics in APH Cases (n=112)

Characteristic	Number	Percentage (%)
Age <25 years	38	33.9
Age 25-35 years	62	55.4
Age >35 years	12	10.7
Primiparous	42	37.5
Multiparous	70	62.5
Previous Caesarean	21	18.8

Table 3 presents maternal complications. Postpartum haemorrhage occurred in 33.04% of cases, with a higher incidence in placenta previa (OR 2.8, 95% CI 1.1-7.2, p=0.031). Anaemia was prevalent in 40.18% of cases.

Table 3: Maternal Complications in APH Cases (n=112)

Complication	Number	Percentage (%)
Postpartum Haemorrhage	37	33.04
Anaemia	45	40.18
Sepsis	8	7.14

Shock	5	4.46
Retained Placenta	3	2.68
Death	2	1.78
Near miss cases	5	4.46

Table 4 shows perinatal outcomes. Perinatal mortality was 60 per 1000 births, with prematurity (52.7%) and low birth weight (47.3%) being common. Abruptio placentae was associated with higher perinatal mortality (OR 4.1, 95% CI 1.6-10.5, p=0.003).

Table 4: Perinatal Outcomes in APH Cases (n=112)

Outcome	Number	Percentage (%)
Premature Birth	59	52.7
Low Birth Weight (<2500g)	53	47.3
Intrauterine Death	7	6.3
Birth Asphyxia	12	10.7
Congenital Malformation	3	2.7

Table 5 compares outcomes by APH cause. Placenta previa required caesarean delivery in 82.1% of cases, compared to 53.6% for abruptio placentae (p=0.008). Major placenta previa (Types III-IV) had a higher haemorrhage risk (OR 3.18, 95% CI 1.22-8.33, p=0.017).

Table 5: Comparison of Outcomes by APH Cause

Outcome	Placenta Previa (n=52)	Abruptio Placentae (n=28)	p-value
Caesarean Delivery (%)	82.1	53.6	**0.008**
Postpartum Haemorrhage (%)	20	17	**0.031**
Perinatal Mortality (per 1000)	38.5	107.1	**0.003**

DISCUSSION

This prospective study found an APH incidence of 1.15%, lower than the 2-5% reported globally (CDC 2015). Abruptio placentae (46.43 %) and Placenta previa (42.86%) were the leading causes, not consistent with studies by Arora (46.4% previa, 25% abruption) and Paintin (0.4% previa, 0.7% abruption) (Arora 2000, Paintin 1962). The high proportion of unclassified haemorrhage (10.71%) reflects diagnostic challenges without advanced imaging, as noted by Ananth et al. (Ananth 1996).

Maternal complications, particularly postpartum haemorrhage (33.04%), were more frequent in placenta previa cases (OR 2.8, p=0.031), aligning with Bahar et al.'s findings of increased haemorrhage in major previa (OR 3.18, p=0.017) (Bahar 2008). The 40.18% prevalence of anaemia underscores the impact of pre-existing nutritional deficiencies in India, exacerbating APH outcomes (Das 1975). Perinatal mortality (60 per 1000) was significantly higher than in developed countries (<10 per 1000), reflecting limited neonatal care access (Crane 1999). Abruptio placentae was associated with a fourfold higher perinatal mortality risk (p=0.003), consistent with Ananth et al.'s report of increased fetal loss in abruption cases (Ananth 1999b).

Caesarean delivery was required in 82.1% of placenta previa cases, comparable to Frederiksen et al.'s findings (85%) (Frederiksen 1999). Expectant management in preterm cases reduced immediate delivery rates, supporting Cotton et al.'s advocacy for conservative approaches when bleeding is controlled (Cotton 1980).

Risk factors like multiparity and prior caesarean delivery were prevalent, corroborating Getahun et al.'s 47-100% increased previa risk post-caesarean (Getahun 2006). Advanced maternal age (>35 years) was a significant factor (p=0.021), consistent with Parazzini et al.'s fourfold risk increase (Parazzini 1991). The prospective design allowed real-time risk factor assessment, enhancing the reliability of these associations.

Regarding the death cases: 1 case was unbooked multi gravida 38 weeks, severe anaemia with placenta praevia came in shock: caesarean hysterectomy was done. The other case was primi gravida 36 weeks, eclampsia with abruption with DIC. Despite of all the necessary treatment as per protocol two cases of maternal mortality were reported.

The prospective approach strengthened our study by minimizing recall bias and enabling standardized data collection at presentation. However, limitations include the lack of molecular or histological data to confirm unclassified haemorrhages and potential selection bias due to the tertiary care setting. Future studies should incorporate advanced diagnostics and multicenter designs to enhance generalizability.

CONCLUSION

This prospective study highlights the significant burden of APH in tertiary care center, with abruptio placentae and

placenta previa as major contributors to maternal and perinatal morbidity. Early diagnosis via ultrasonography and tailored management strategies, including expectant management for preterm cases and caesarean delivery for severe haemorrhage, improved outcomes. However, high perinatal mortality and maternal complications like postpartum haemorrhage and anaemia underscore the need for enhanced antenatal care, timely intervention, and improved neonatal facilities. Deaths could have been prevented by early referral. Targeted screening for high-risk groups (multiparous women, prior caesarean, advanced age) and increased access to diagnostic and therapeutic resources could further reduce APH-related morbidity and mortality.

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