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Original Research Article

Evaluation of fetomaternal outcome in patients of antepartum hemorrhage in a tertiary care center: A descriptive and observational study

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Abstract

Background: Antepartum hemorrhage (APH) is a significant obstetric emergency leading to adverse maternal and fetal outcomes.
Aim and Objective: This study aimed to evaluate fetomaternal outcomes in patients with APH in a tertiary care setting.
Materials and Methods: The prospective observational study was conducted on140 cases in the Department of Obstetrics and Gynecology, associated with Lala Lajpat Rai Memorial Medical College, Meerut from 1 November 2022 to 30 October 2023.
Results: The study group primarily consisted of younger adults, with 47.14% aged between 26-30 years, and a significant portion from lower socio-economic backgrounds, with 66.67% falling into this category. A notable 65% of participants were multigravida, indicating a prevalence of experienced mothers. Emergency LSCS was the predominant mode of delivery, performed in 70% of cases, while 58% required blood transfusions, reflecting substantial intervention needs. Maternal morbidity was high (91%), though maternal mortality remained low (2%). Most participants (93.57%) were unbooked, suggesting low prenatal care, and 52.14% were illiterate. Placenta previa was the most frequent cause of APH, seen in 57% of cases. The study revealed significant neonatal morbidity and mortality, with 50.7% of newborns requiring NICU admission and 5.2% being stillborn
Conclusion: The study highlights that antepartum hemorrhage, primarily caused by Placenta previa, is associated with significant maternal and neonatal morbidity. High rates of emergency cesarean sections, blood transfusions, and neonatal complications were observed. Improved antenatal care, early diagnosis, and timely interventions are crucial to improve obstetrical outcomes.

Keywords: Antepartum hemorrhage, Placenta previa, Maternal morbidity, Neonatal outcomes.

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1. Introduction

Antepartum hemorrhage (APH) is a critical obstetric emergency that affects 3-5% of pregnancies and is a major cause of maternal mortality (30-50%). It is characterized by bleeding from the genital tract after the period of viability (after 28 weeks in India and 24 weeks in Western countries) but before the end of the second stage of labor. APH can be categorized based on blood loss into minor (<50 ml), major (50-1000 ml), and massive (>1000 ml) hemorrhage.[1]

The primary maternal causes include placental bleeding such as placenta previa (35%) and abruptio placenta (35%), with other causes like cervical trauma, infections, and uterine rupture. Fetal causes include rare conditions like vasa previa (<1%). Miscellaneous causes include anomalies in the placenta and umbilical cord, such as circumvallate placenta and velamentous cord insertion.[2]

Placenta previa is characterized by low implantation of the blastocyst and is influenced by factors like increased parity, advanced maternal age, multiple pregnancies, and previous uterine procedures or cesarean sections. Smoking and certain placental abnormalities are also associated with its occurrence.[3,4] Placenta accreta is more common in women with placenta praevia. Diagnosis involves ultrasound, Color Doppler, and sometimes MRI, but none are fully reliable.[5]

APH complications include anemia, preterm labor, cesarean section, and various fetal risks like low birth weight

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and Intrauterine Fetal Death (IUFD).[6] Aggressive management, including early detection, regular antenatal care, and timely intervention, can reduce maternal and perinatal morbidity and mortality.[7] Improved diagnostic techniques, obstetric care, and neonatal support have significantly contributed to better outcomes. Preventive measures include early registration, antenatal care, and early referral to higher centers.

2. Materials and Methods

2.1. Place of study

This research was conducted in the Department of Obstetrics and Gynecology at Lala Lajpat Rai Memorial (LLRM) Medical College, Meerut. The study period spanned from November 1, 2022, to October 30, 2023. Prior to commencing the study, ethical approval was obtained from the institutional ethics committee to ensure compliance with ethical guidelines, safeguarding the rights and welfare of all participants.

2.2. Study design

The study employed a Prospective Observational design. This approach was chosen to systematically collect, analyze, and present data related to the conditions and practices observed within the study population without interfering or altering the natural course of events.

2.3. Sample size

Based on last year's data, the prevalence rate of APH was calculated as 3.37% (0.037). With an absolute precision of 3% and a confidence level of 95%, the minimum sample size required was determined using the formula:

$N = Z^2 * p * (1-p) / d^2$

After calculation, the minimum required sample size was approximately 140.

2.4. Inclusion criteria

1. All antenatal cases (ANC) with APH from 28 weeks onwards.

2.5. Exclusion criteria

1. Any ANC < 28 weeks with bleeding per vaginum.
2. Patients with other bleeding disorders.
3. Bleeding from sources other than the genital tract.

2.6. Tools and techniques

After obtaining written and informed consent, eligible patients were enrolled in the study. Gestational age was determined based on the last menstrual period (LMP) or early trimester ultrasonography. Comprehensive history-taking (including menstrual and obstetric history) was done, followed by a thorough physical and systemic examination. Obstetric examinations assessed fundal height, presentation, fetal heart rate, uterine tone, and contractions. A local and per speculum examination was performed to evaluate the severity of bleeding and to exclude any local lesions.

Relevant antenatal investigations were conducted, and management was determined based on gestational age, cause and severity of bleeding, and the fetomaternal condition. The patients managed conservatively, were followed until delivery, and fetomaternal outcomes, including mode of delivery as well as intrapartum and postpartum complications, were documented.

All parameters, including demographic data, were recorded on a working proforma. Patients presenting with APH were initially investigated and managed according to standardized protocols, with further management tailored to the cause, severity, type of bleeding, and gestational age.

2.7. Statistical analysis

Data were analyzed using descriptive and inferential statistical methods to understand the distribution and outcomes related to Antepartum Hemorrhage (APH). Statistical analysis was performed using SPSS version 26.0. categorical variables were presented as frequency and percentage.

3. Results & Analysis

Table 1, A total of 140 cases with APH (> 28 weeks) were analyzed in this study. The incidence of APH reported from this study is 4.8%. The majority of patients were aged 26-30 years (47.14%), with 66.67% belonging to the lowest socio-economic class (Class V). Most patients were multigravida (76%), and nearly half (45%) were at a gestational age of 28-33 weeks. The most common chief complaint was painless bleeding (70%), followed by symptoms such as headache and epigastric pain (15%).

Table 2, the analysis revealed that the majority of participants, 70 out of 140 (50%), experienced a moderate level of antepartum hemorrhage. Both the mild and severe categories had equal frequencies, with 35 participants (25%) each. This distribution suggests that while moderate antepartum hemorrhage is the most common severity level, mild and severe cases were equally prevalent among the studied population.

The **Table 3** represents the distribution of Antepartum Hemorrhage (APH) cases by etiology in a study group of 140 cases. The most common type was Placenta Previa observed in 80 cases (57%), abruption placenta in 45 cases (32.3 percent) and undetermined cases was 15 cases (10.7 percent).

The distribution of cases based on the indication for LSCS (Lower Segment Cesarean Section) in patients with Antepartum Hemorrhage (APH). The primary reasons for LSCS include actively bleeding with placenta previa, accounting for 43.8% of cases. Fetal distress follows with 32.6%, and uncomplicated placenta previa represents 20.2%.

Abruptio placenta and undetermined causes account for 8.4% and 2.8%, respectively.

Additionally, 18.4% of cases involve patients with one previous cesarean section and symptomatic thrombosis (ST), with further breakdowns showing 12.2% for placenta previa, 6.2% for abruptio placenta, and no cases undetermined.

Cases involving patients with two previous cesarean sections and labor pains make up 5.2%, with further subcategories including adherent placenta (2.1%), placenta previa (2.1%), and abruptio placenta (1%).

LSCS accounts for the largest proportion, with 98 cases (70%). Out of total LSCS cases, 3 were proceeded for obstetric hysterectomy due to uncontrolled haemorrhage.

The **Table 5** represents the distribution of Antepartum Hemorrhage (APH) cases associated with various risk factors. The most prevalent risk factor was anemia, affecting 68 cases (48.5%) followed by pre-eclampsia, observed in 21 cases (15%). Oligohydramnios is present in 10 cases (7%). Twin pregnancy, and a history of APH in a previous pregnancy, each account for 2 cases (1.4%). Hypothyroidism is noted in 4 cases (2.8%). Other risk factors such as abdominal trauma, hyperthyroidism, PPROM, APE, thrombocytopenia, HIV+, and HbsAg+ are each reported in 1 case (0.7%). This data highlights the significant impact of anemia and pre-eclampsia among the observed APH cases, suggesting critical areas for medical intervention and management.

Table 1: Demographic profile (n=140)

Category	Subcategory	Frequency	Percentage
Age Distribution	Up to 25 years	46	32.86%
	26-30 years	66	47.14%
	Above 30 years	28	20.00%
Socio-Economic Status (Modified B.G. Prasad)	Class I	0	0%
	Class II	2	1.23%
	Class III	3	2.1%
	Class IV	42	30%
	Class V	93	66.67%
Gravidity	Multigravida	106	76%
	Primigravida	34	24%
Gestational Age	28-33 weeks	63	45.0%
	34-36 weeks	30	21.0%
	≥ 37 weeks	47	34.0%
Chief Complaints	Painless bleeding	98	70%
	Painful bleeding	18	13.0%
	Headache, epigastric pain, blurring of vision, pedal edema (with BPV)	22	15%
	Convulsion	1	1%
	Watery discharge (PPROM)	1	1.0%

Table 2: Distribution of participants according to severity of condition

Severity level	Frequency	Percentage
Mild	35	25.0%
Moderate	70	50.0%
Severe	35	25.0%
Total	140	100.0%

Table 3: Distribution of antepartum hemorrhage (APH) cases by etiology

Etiology	Frequency	Percentage
Placenta previa	80	57.0%
Abruption Placenta	45	32.3%
Undetermined	15	10.7%
Total	140	100.0%

Table 4: Distribution of cases on the bases of indication of LSCS in APH patient

Indication	Frequency	Percentage
1. Actively Bleeding with Placenta previa	43	43.8%
2. Foetal distress	32	32.6%
a. Placenta previa	20	20.2%
b. Abruptio Placenta	8	8.4%
c. Undetermined	4	2.8%
3. Previous 1 with ST	18	18.4%
a. Placenta Previa	12	12.2.%
b. abruption Placenta	6	6.2%
c. undetermined	0	0
4. Previous 2 LSCS with labor pains	5	5.2%
a. With adherent placenta	2	2.1%
b. Placenta previa	2	2.1%
c. Abruptio placenta	1	1%
Total	98	100

Table 5: Distribution of APH cases according to various risk factors

Risk Factor	Frequency	Percentage
1. Obstetrical causes	57	40.7%
Multiple pregnancy; Twin pregnancy	2	1.4%
History of D and C	4	2.8%
Polyhydramnios	1	0.7%
Oligohydramnios	1	0.7%
Prior uterine scar; caesarean, myomectomy, hysterotomy	20	14.0%
Prior H/O APH	2	1.4%
Rh negative pregnancy	5	3.5%
PPRPOM	1	0.7%
Pre-Eclampsia	21	15.0%
2. Medical causes	80	57.0%
Diabetes	1	0.7%
Anaemia	68	48.5%
Hyperthyroidism	1	0.7%
Hypothyroidism	4	2.8%
Thrombocytopenia	1	0.7%
Infection	5	3.5%
HbsAg	1	0.7%
HCV	3	0.1%
HIV	1	0.7%
Cyanotic heart disease	1	2.0%
3. Surgical	3	2.1
Abdominal Trauma	2	1.4
Ascites	1	0.7
Total	140	100

Table 6: Distribution of APH cases according to delivery associated with postnatal complication/outcome

Complication	Frequency	Percentage
PPH	12	8.7%
Shock	5	3.6%
Death	3	2.0%
Others	5	3.6%
No Complications	112	82.1%

Majority of 112 patients (80.21%) had no complications associated with deliveries. This highlights that a significant portion of the study group did not experience postnatal complications indeliveries.

Table 7: Distribution according to fetal outcome

Description	Frequency	Percentage
- NICU Admission	71	50.7%
>7 days	55	39.2%
Survive	48	34.0%
Expired	7	5.0%
<7 days	16	11.4%
Survive	9	6%
Expired	7	5%
Total	71/140	50.7/100%

The **Table 7** represents the distribution of participants according to fetal outcomes. Out of 140 total cases, 103 (73) were Live and 30 (21%) IUFD among the 103 Live (51%) cases, 71 (50.7%) required NICU admission, while 32 (23%) were alive and healthy. This distribution highlights the various fetal outcomes, with a significant number of stillborn and expired cases, and shows that while over half of the cases survived, a substantial proportion required NICU care.

4. Discussion

In the present study, the incidence of APH was 4.8%. This incidence rate is within the range reported in similar studies, which generally quote an incidence of 2-5%. For example, Cunningham et al (2018). Reported an APH incidence of 2.01% [7], while Ahenkorah B et al. Noted an incidence of 2.53%.[8] The slight variation in our study could be attributed to differences in the patient population, geographic factors, and healthcare accessibility.

The majority of patients in our study were aged 26-30 years (47.14%), which aligns with findings from Tyagi P et al, who also found a higher prevalence of APH in the 25-30-year age group.[9]

In our study, 66.67% of the patients belonged to the lowest socio-economic class (Class V). This is an important finding that underscores the socio-economic disparity in health outcomes. Previous research by Moutquin JM et al. also demonstrated that women from lower socio-economic classes are more likely to develop APH due to limited access to antenatal care and delayed presentation to healthcare facilities.[10]

The present study showed that nearly half (45%) of the patients presented between 28-33 weeks of gestation. Similar findings have been observed by Qualls BW et al., who noted a high occurrence of APH cases around 30 weeks gestation, suggesting that increased uteroplacental stress during this period might contribute to higher rates of bleeding.[11]

The most common chief complaint was painless bleeding (70%), which aligns with the findings from a study by Ventura Zorrilla JC, where painless bleeding was also identified as the predominant symptom of APH, particularly in cases of placenta previa.[12] In addition, 15% of our patients had symptoms like headache and epigastric pain, which may suggest an association with preeclampsia, as noted by Anthoulakis C et al.[13]

Based on the analysis, our findings indicate that 50% of participants experienced moderate antepartum hemorrhage, while mild and severe categories each comprised 25% of the cases. This distribution suggests that moderate severity is the most common form of antepartum hemorrhage (APH) among our studied population, while both mild and severe forms are equally represented. Similar to our findings, Kulkarni AR et al. also reported a significant proportion of moderate APH cases (45%), but noted a lower frequency of severe APH (20%) compared to mild APH (35%).[14] This discrepancy might be due to differing clinical criteria for categorizing the severity of APH or due to better access to early intervention in their study setting.

In our study group of 140 cases of Antepartum Hemorrhage (APH), the most common etiology was Placenta Previa, observed in 57% of cases, followed by abruption placenta in 32.3% and undetermined causes in 10.7%. This distribution aligns with findings from other studies, though variations exist depending on patient populations, healthcare settings, and diagnostic capabilities. The prevalence of Placenta Previa as the leading cause of APH in our study aligns with the findings of Gibbins KJ et al., who reported Placenta Previa as the most frequent etiology, accounting for 55% of APH cases.[15] Similarly, Takai IU et al. found Placenta Previa in 60% of APH cases in their study conducted at a tertiary care center in a rural area.[16] These results support the observation that Placenta Previa is frequently the predominant cause of APH, possibly due to delayed diagnosis or suboptimal antenatal care leading to higher prevalence.

The indication for LSCS in APH cases in our study is consistent with findings from Nielsen TF et al., who reported placenta previa as the leading indication for cesarean sections among APH patients, accounting for 40-45% of the cases.[17] The actively bleeding placenta previa as a major indication

for cesarean suggests a high risk of maternal and fetal morbidity, often necessitating timely surgical intervention.

The rate of LSCS due to fetal distress (32.6%) in our study is also comparable to the findings of Jena MK et al., which showed that fetal distress was an indication in 30-35% of APH cases undergoing LSCS.[18] Fetal distress, often secondary to compromised placental function in cases like abruption placenta or placenta previa, necessitates urgent delivery to reduce perinatal mortality.

Uncomplicated placenta previa leading to LSCS in 20.2% of cases in our study aligns with the findings of Sangwan V et al., who reported a 20-25% rate of LSCS for cases where placenta previa was present without active bleeding but with a high risk for complications.[19] Elective cesarean in such cases is typically performed to prevent labor onset and reduce risks to both the mother and fetus.

Abruptio placenta, as an indication in 8.4% of cases, and undetermined causes (2.8%) are consistent with other literature, such as the study by Fernandes J et al., which highlighted that abruptio placenta accounts for 10% of LSCS cases involving APH.[20] This reinforces the understanding that placental abruption can lead to acute fetal compromise or maternal instability, necessitating cesarean delivery.

The high percentage of patients without complications (82.1%) in our study contrasts with some findings in the literature. Patel et al. reported that 70% of patients with APH had uncomplicated deliveries, while 30% experienced varying degrees of complications.[21] The higher rate of uneventful deliveries in our study might reflect effective prenatal monitoring, timely interventions, or improved supportive care in our setting, allowing for a favorable outcome despite the high-risk nature of APH.

Agarwal et al. noted that 75% of women with APH had uncomplicated deliveries, emphasizing that access to good healthcare and prompt decision-making, especially regarding the timing of delivery and mode of birth, plays a key role in preventing complications.[22] Our findings are comparable and underscore the importance of a systematic approach to managing APH to ensure that most patients deliver without adverse outcomes.

The absence of complications in 82.1% of our patients might also be influenced by antenatal corticosteroid administration, which has been shown to improve neonatal outcomes in APH cases. Bashir HA et al. reported that corticosteroid use significantly reduced neonatal intensive care admissions and associated complications, thereby contributing to smoother deliveries.[24] This further supports the idea that proactive clinical management can significantly enhance outcomes in APH-affected pregnancies.

In our study of 140 cases of Antepartum Hemorrhage (APH), 73.6% of fetuses were delivered alive, while 21.4% were intrauterine deaths (IUD). Among the 103 live births, 50.7% required NICU admission, and 23% were live and healthy without NICU support.

Jharaik H et al. reported similar live birth rates (70-75%) in APH cases,[24] while Kaushal V et al. found 18-20% IUD rates.[25] The high rate of NICU admissions (50.7%) is consistent with Long SY et al., who noted 40-50% NICU admission rates due to prematurity and respiratory distress.[26] Huang S et al. reported 20-25% of live births being healthy without NICU admission, comparable to your findings.[27]

5. Conclusion

The study highlights that antepartum hemorrhage, primarily caused by Placenta Praevia, is associated with significant maternal and neonatal morbidity. High rates of emergency cesarean sections, blood transfusions, and neonatal complications like NICU admissions were observed. Low socioeconomic status, poor prenatal care, and education levels were prevalent risk factors. Improved antenatal care, early diagnosis, and timely interventions are crucial to better managing APH cases and improving outcomes for both mother and child.

6. Source of Funding

None.

7. Conflict of Interest

None.

8. Ethical Approval

Ethical No.: SC-1/2024/5723.

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