ORIGINAL ARTICLE

Clinical Profile and Fetomaternal Outcomes of Antepartum Haemorrhage at a Tertiary Care Center in Nepal: A Retrospective Study

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Abstract

Introduction: Antepartum haemorrhage is a major obstetric emergency and an important contributor to maternal and perinatal morbidity, particularly in low- and middle-income countries. Delayed presentation, limited accessibility, availability to emergency obstetric care worsens outcomes. This study described the clinical profile and fetomaternal outcomes of Antepartum haemorrhage at a tertiary care center in Nepal.

Methods: A retrospective descriptive study was conducted at a tertiary care center in Nepal. Medical records of all eligible women admitted with Antepartum haemorrhage at ≥28 weeks of gestation and delivered from 1 January 2021 to 31 January 2024 were reviewed. Data were extracted using a structured proforma and summarized using frequencies and percentages or mean ± standard deviation/median (range), as appropriate. Ethical approval was obtained from the Institutional Review Board (Reference: drs2510282140).

Results: Antepartum haemorrhage occurred in 185 of 10,111 (1.83%) deliveries. The mean maternal age was 30.88 ± 4.64 years, and 77 (41.62%) women were primigravida. Placenta previa 78 (42.16%) and abruptio placentae 67 (36.22%) were the leading diagnoses. Postpartum haemorrhage occurred in 64 (34.59%) women, 34 (18.38%) required blood transfusion, and 16 (8.65%) required ICU admission; no maternal deaths were recorded. Preterm delivery occurred in 75 (40.54%) pregnancies, 74 (40.00%) neonates required NICU admission, intrauterine fetal death occurred in 6 (3.24%), stillbirth in 4 (2.16%), and early neonatal death in 19 (10.27%) cases.

Conclusions: Antepartum haemorrhage was accompanied by higher maternal and perinatal morbidity in this tertiary-care cohort, particularly Postpartum haemorrhage, preterm delivery, and Neonatal ICU admission.

Keywords: *abruptio placenta; antepartum haemorrhage; placenta previa; maternal outcome.*

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Introduction

Antepartum haemorrhage (APH) is a major cause of maternal and perinatal morbidity and mortality in low- and middle-income countries (LMICs).[1,2] The leading causes are placenta previa, abruptio placentae, and placenta accreta spectrum (PAS).[3,4] Placenta previa is associated with previous cesarean section (CS), uterine surgery, advanced maternal age, multiparity, smoking, and assisted reproductive technology, abruptio placentae with pregnancy-induced hypertension, premature rupture of membranes, trauma, and advanced maternal age.[5,6]

In Nepal, the CS rate has increased from 10.20% in 2016 to 18.2% in 2022, with rates exceeding 40% in tertiary hospitals.[7-10] Delayed presentation, limited access to emergency obstetric care and tertiary services worsens outcomes.[2,11-13] Despite this, data describing the clinical profile, risk factors, and fetomaternal outcomes of APH from tertiary care centers in Nepal remain limited.

This study aimed to evaluate the clinical profile and fetomaternal outcomes of APH at a tertiary care teaching hospital in Nepal.

Methods

A retrospective descriptive study was conducted at the Department of Obstetrics and Gynecology, Patan Academy of Health Sciences (PAHS), Lalitpur, Nepal, a tertiary referral center. Medical records of women admitted with APH between January 2021 and January 2024 were reviewed.

The inclusion population comprised women admitted with bleeding at or beyond 28 completed weeks of gestation and before delivery. Women were eligible when APH was documented during the admission and they subsequently delivered at PAHS during the study period. Records were excluded when the bleeding was considered to be non-obstetric or mother had coagulation disorder, clinical or outcome information was incomplete/missing. When a woman had more than one admission for the same pregnancy, only the index admission used for the study dataset was included. All records meeting the eligibility criteria were included; no sampling procedure was applied.

Eligible cases were identified from the available hospital records for the study period. Data were extracted by the first author using a structured proforma developed for the study. The proforma included maternal age, gravidity and parity, previous caesarean delivery, previous dilatation and curettage, duration of bleeding before admission, gestational age, presenting symptoms and signs, ultrasonographic findings, associated obstetric conditions, final diagnosis, mode of delivery, interventions, and maternal and perinatal outcomes. Information was obtained from routinely documented clinical records. Extracted entries were checked against the source records during data preparation.

APH was defined as bleeding after 28 weeks of gestation and before delivery. Postpartum hemorrhage (PPH) was defined as blood loss ≥500 mL after vaginal delivery or ≥1000 mL after cesarean section (excluding hysterectomy). Caesarean hysterectomy was recorded separately. Preterm delivery was defined as birth before 37 completed weeks of gestation. Anaemia was defined as haemoglobin <11 g/dL, and thrombocytopenia as a platelet count <150,000/mm³. Pregnancy-induced hypertension (PIH) and premature rupture of membranes (PROM) were recorded when documented in the clinical record.

Placental location and suspected placental pathology were extracted from ultrasonography reports. An upper-segment placenta was considered normally located, a low-lying placenta had its lower edge within 20 mm of the internal cervical os, and placenta previa partially or completely covered the internal os. PAS referred to suspected abnormal placental adherence or invasion. [14] A documented retroplacental clot supported placental abruption. Amniotic fluid volume was classified from the reported amniotic fluid index (AFI) using the four-quadrant assessment recorded by the radiology service. [19,20] The ultrasonographic category and the final clinical diagnosis were retained as separate variables. The final APH diagnosis was assigned from the overall clinical and ultrasonographic record and was categorised as placenta previa, placental abruption, PAS, or undetermined bleeding. Maternal outcomes included mode of delivery, blood transfusion, PPH, anaemia, sepsis, disseminated intravascular coagulation, acute renal failure, caesarean hysterectomy, intensive-care-unit (ICU) admission, and maternal death. Perinatal outcomes included gestational age at delivery, preterm birth, birth weight, fetal growth restriction, birth asphyxia, neonatal jaundice, need for neonatal intubation, neonatal ICU admission, intrauterine fetal death, stillbirth, and early neonatal death. Outcomes were reported using the denominators available in the final dataset.

Data were analyzed using Python version 3.14 (Pandas). The analysis was descriptive. Categorical variables were summarized as frequencies and percentages, and continuous variables as mean ± standard deviation or median (range), as appropriate. No inferential hypothesis testing or regression modelling was performed. Ethical approval was obtained from the Institutional Review Board of

PAHS (reference: drs2510282140). Because the study involved retrospective review of existing records, the requirement for individual informed consent was waived. The dataset used for analysis was anonymised, and personally identifying information was not included.

Results

During the study period, 10,111 deliveries occurred at the study site, of which 3,975 (39.30%) were vaginal deliveries and 6,136 (60.70%) were cesarean sections (Figure 1). 185 women admitted with APH were included, giving a hospital-based APH proportion of APH of 1.83% (185/10,111).

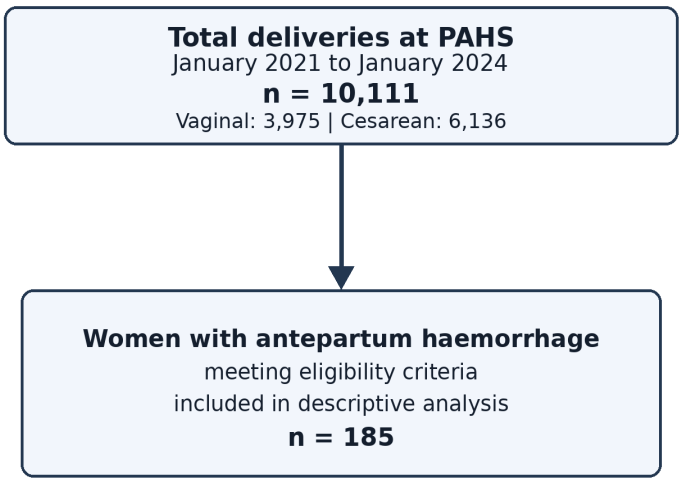

Figure 1: Study flow chart.

The mean maternal age was 30.88±4.64 years, and 77 (41.62%) women were primigravida. The median duration of haemorrhage before admission was 6 hours (range: 2-68 hours). Previous lower-segment cesarean section and dilatation and curettage were documented in 47 (25.41%) and 24 (12.97%) women, respectively. Mean gestational age at delivery was 36.12±2.71 weeks (Table 1).

Vaginal bleeding was documented at admission in 144 women (77.84%), and abdominal pain in 51 (27.57%). Uterine contractions were present in 23 (12.43%), cervical dilatation in 24 (12.97%), and 21 (11.35%) presenting in labour. Fetal heart sounds were absent in 6 women (3.24%). The mean symphysiofundal height was 33.74±2.75 cm (Table 1).

Table 1: Clinical profile among women with antepartum haemorrhage (n= 185).

Variable	Value
A. Clinical characteristics	
Age (years), mean±SD	30.88±4.64
Primigravida, n (%)	77 (41.62)
Median parity (range)	2 (0-5)
Previous LSCS, n (%)	47 (25.41)
Previous D&C, n (%)	24 (12.97)
Duration of haemorrhage (hours), median (range)	6 (2-68)
Gestational age at delivery (weeks), mean±SD	36.12±2.71
B. Clinical features	
Abdominal pain, n (%)	51 (27.57)
Per vaginal bleeding, n (%)	144 (77.84)
Uterine contraction present, n (%)	23 (12.43)
Cervical dilation present, n (%)	24 (12.97)
C. Investigation	
Placental location (on ultrasonography)	
Upper segment (normal)	92 (49.73)
Placenta previa	57 (30.81)
Low-lying placenta	20 (10.81)
Anterior placenta	6 (3.24)
Posterior placenta	3 (1.62)
Placenta accreta spectrum (PAS)	6 (3.24)
Retroplacental clot (abruption)	1 (0.54)
Amniotic fluid index	
Normal	171 (92.43)
Polyhydramnios	6 (3.24)
Reduced liquor	5 (2.70)
Oligohydramnios	1 (0.54)
Absent liquor	2 (1.08)

On ultrasonography, 92 (49.73%) women had an upper-segment placenta, 57 (30.81%) had placenta previa, and 20 (10.81%) had a low-lying placenta. Six records (3.24%) were coded as anterior placenta and three (1.62%) as posterior placenta without an additional relation-to-the-internal-os category, while 6 (3.24%) were recorded as PAS and 1 (0.54%) as having a retroplacental clot. The AFI was documented as normal in 171 women (92.43%). Polyhydramnios was recorded in 6 (3.24%), reduced liquor in 5 (2.70%), oligohydramnios in 1 (0.54%), and absent liquor in 2 (1.08%) (Table 1).

PIH was documented in 36 (19.46%) women, PROM in 26 (14.05%), and anaemia in 29 (15.68%). The final clinical diagnosis was placenta previa in 78 (42.16%) women, placental abruption in 67 (36.22%), undetermined APH in 36 (19.46%), and PAS in 4 (2.16%) (Table 2).

Table 2: Fetomaternal outcome among women with antepartum haemorrhage (n = 185).

A. Obstetric characteristics and maternal outcomes	
Cesarean delivery, n (%)	166 (89.72)
Final diagnosis	
Placenta previa	78 (42.16)
Abruptio placentae	67 (36.22)
Undetermined	36 (19.46)
PAS	4 (2.16)
Pregnancy-induced hypertension, n (%)	36 (19.46)
Premature rupture of membranes, n (%)	26 (14.05)
Anaemia, n (%)	29 (15.68)
Postpartum haemorrhage, n (%)	64 (34.59)
Blood transfusion, n (%)	34 (18.38)
Cesarean hysterectomy, n (%)	6 (3.24)
ICU admission, n (%)	16 (8.65)
Sepsis, n (%)	1 (0.54)
B. Perinatal Outcomes	
Preterm delivery, n (%)	75 (40.54)
NICU admission, n (%)	74 (40.00)
Intrauterine fetal death (IUFD), n (%)	6 (3.24)
Stillbirth, n (%)	4 (2.16)
Early neonatal death, n (%)	19 (10.27)
Neonatal jaundice, n (%)	7 (3.78)
Intubation required, n (%)	8 (4.32)

Caesarean delivery was performed in 166 (89.72)% women. Notably, a retroplacental clot was identified on ultrasonography in only 1 (0.54%) woman, whereas placental abruption accounted for 67 (36.22%) of final diagnoses. This apparent discrepancy is expected rather than an inconsistency: placental abruption remains primarily a clinical diagnosis, and ultrasound has consistently been shown to have low sensitivity for detecting it, particularly in the acute phase when fresh retroplacental blood is isoechoic with the adiacent placenta. PPH occurred in 64 (34.59%) women. Blood transfusion was required in 34 (18.38%), caesarean hysterectomy in 6 (3.24%), and ICU admission in 16 (8.65%). One (0.54%) women developed sepsis. Haemorrhage-control measures documented in the records included uterine tamponade, arterial ligation, and embolisation. No maternal deaths were recorded in the cohort.

Preterm delivery occurred in 75 (40.54%) pregnancies. 74 (40.00%) neonates required admission to the neonatal ICU, and 8 (4.32%) required intubation. Neonatal jaundice was documented in 7 (3.78%). IUFD was recorded in 6 (3.24%) pregnancies, stillbirth in 4 (2.16%), and early neonatal death in 19 (10.27%). These outcomes were reported separately as documented and were not combined into a composite perinatal mortality measure (Table 2).

Discussion

This retrospective descriptive study provides a contemporary scenario of APH at a tertiary referral hospital in Nepal. APH was recorded in 1.83% of deliveries. Placenta previa and placental abruption were the leading diagnoses, and nearly three-quarters of women delivered by caesarean section. Maternal morbidity was substantial including PPH, transfusion, hysterectomy, and ICU admission. Perinatal morbidity was prominent, with high proportions of preterm delivery and neonatal intensive-care admission, together with fetal and early neonatal deaths. No maternal deaths were recorded. These findings describe the burden among women reaching a tertiary facility and should not be interpreted as population incidence or evidence of causal relationships.

The hospital-based proportion of APH was higher than the 0.23%-0.51% reported in earlier Nepalese studies.[11,12] Differences may reflect referral of complicated pregnancies, variation in gestational-age thresholds, hospital-based rather than population-based denominators, and differences in classifying recurrent or unexplained bleeding. Placenta previa and placental abruption accounted for most final diagnoses, consistent with reports from Nepal and South Asia.[11-13] The prominence of placenta previa is clinically relevant where caesarean delivery rates are increasing, because a uterine scar is a recognised characteristic associated with placenta previa and PAS in subsequent pregnancies.[7-10,14] PAS was uncommon in the final diagnosis, but even a small number of suspected cases has major implications for blood-bank readiness, operative planning, anaesthesia, and experienced multidisciplinary care.

The mean maternal age was 31 years, and more than two-fifths of women were primigravida. Previous caesarean delivery and dilatation and curettage were documented in minority. PIH, PROM, and anaemia were also common. Previous uterine procedures are recognised in the literature on abnormal placentation, while hypertensive disorders and membrane rupture have been described in relation to placental abruption.[5,6,14]

The median interval from bleeding onset to admission was 6 hours, with a maximum of 68 hours. The wide range is clinically important because maternal and fetal status may deteriorate during prolonged transfer. Antenatal counselling should emphasise that late-pregnancy bleeding requires urgent assessment, regardless of pain or apparent blood loss. Referral communication and organised emergency transport are important in geographically difficult areas of Nepal.

PPH occurred in approximately one-third of women, nearly one-fifth received transfusion, 3.24% underwent caesarean hysterectomy, and 8.65% required intensive care. APH may be followed by postpartum bleeding because abnormal placentation, operative delivery, uterine atony, tissue trauma, or coagulopathy can continue to impair haemostasis after birth. Placenta previa and PAS may involve difficult placental separation and major surgical blood loss, whereas severe abruption may be accompanied by concealed haemorrhage and coagulation disturbance.[14-16] These findings support preparedness through intravenous access, haemorrhage protocols, cross-matched blood and components, operation theatre access, anaesthetic support, and escalation to tamponade, vascular control, embolisation, or hysterectomy when required.

Perinatal morbidity was also substantial. This pattern is consistent with South Asian and other LMICs in which APH is accompanied by prematurity and adverse neonatal outcomes.[13,17] PIH, PROM, and previous cesarean section were common clinical characteristics in this cohort. Because the study was descriptive and lacked a comparison group, these factors should not be interpreted as independent predictors or causes of a specific APH subtype or outcome. Nevertheless, antenatal detection and management of hypertensive disorders, judicious use of cesarean delivery, and counselling about future placental risks remain important components of obstetric care.[6,7,14,18]

This study is limited by its retrospective, single-center design, which may have selected for more severe referral cases and limits generalizability. Reliance on routinely documented medical records may also have resulted in missing information, misclassification, or under-reporting of outcomes. The absence of a comparison group and the descriptive design preclude estimation of risk, causal relationships, or independent predictors. Prospective multicenter studies with standardized definitions and complete follow-up are needed to confirm the observed patterns and evaluate strategies for improving antenatal surveillance, referral, and emergency management.

Conclusions

Antepartum haemorrhage represented a notable obstetric complication in this tertiary care cohort and was associated with substantial maternal and perinatal morbidity. Postpartum haemorrhage, preterm delivery, and neonatal intensive care unit admission were common adverse outcomes, although no maternal deaths were observed.

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