COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

INCIDENCE, PERINATAL AND MATERNAL OUTCOME AND ASSOCIATED FACTORS OF ANTEPARTUM HEMORRHAGE AT AAU, 2024/5

PRINCIPAL INVESTIGATOR: - DR. Biniyam Denekew (Resident in Gynecology and Obstetrics)

ADVISORS: - Dr. Eskinder Kebede (MD, Associate Proffecer In Gynecology and Obstetrics Subspecialist in REI and Minimal Access Surgery)

: -Dr: Tesfaye Adem (MD, Assistant Professor of Obstetrics and Gynecology, Gynecology Oncology Fellow)

Research submitted to Addis Ababa University, department of gynecology and obstetrics, college of health sciences, in partial fulfillment of the requirements for the specialty in gynecologist and obstetrician.

July, 2025,

Ethiopia, Addis Ababa

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Declaration

DRPC FORM III: RESEARCH PROPOSAL APPROVAL BY ADVISORS[1]

ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, POSTGRADUATE PROGRAM

I, Dr. Biniyam Denekew, hereby declare that this research thesis entitled " Magnitude and associated factors of antepartum hemorrhage at AA, Ethiopia, 2024GC." in line with the requirement of graduate studies was fully undertaken by me under the guidance of my advisors and that I have, to the best of my knowledge and effort, avoided plagiarism or duplication of materials unless and otherwise cited and/or acknowledged and that it has not been so far submitted for any form of proposal application or consideration.

Investigator Dr. Biniyam Denekew _____ _____

We hereby certify that we have read and evaluated this research thesis relating to" Magnitude and associated factors of antepartum hemorrhage at AA, Ethiopia, 2024GC. **"** under our guidance from its inception up to in its current format including ethical issues and that it can be submitted to the DRPC for further administrative processing & documentation of the proposal by the Department as part of the resident's research undertaking for his/ her partial fulfilment to the Degree of Specialty in Obstetrics and Gynaecology.

Advisors Dr. Eskindir Kebede _____ _____

Dr. Tesfaye Adem _____ _____

[1] NOTE: THIS IS ADVISORS APPROVAL OF THE PROPOSAL FOR METHODOLOGICAL & ETHICAL ISSUES APPROPRIATENESS INCLUDING THE DATA COLLECTION PROCESS AND PARTICIPANTS PROTECTION &RIGHT.

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Abbreviation and acronym

AAU	Addis Ababa University
AOR	Adjusted Odd Ratio

APH	Antepartum hemorrhage
DIC	Disseminated intravascular coagulation
ENND	Early Neonatal Deaths
FHBP	Fetal heart-rate pattern
IUD	Intra Uterine death
PIH	Pregnancy Induced Hypertension
PNM	Perinatal mortality
PP	Placenta Previa
PPH	Post-partum hemorrhage
UAE	Uterine artery embolization
WHO	World Health Organization
APO	Adverse Perinatal Outcome
AMO	Adverse Maternal Outcome
LBW	Low birth weight

Summery

Background: - Antepartum hemorrhage is an obstetric emergency occurs in 2-5% of pregnancies. it is significant contributor to perinatal and maternal morbidity and mortality. APH takes 30% of maternal deaths of which 50% of the deaths are due to preventable causes.

Objective: - To measure Antepartum hemorrhage's incidence, perinatal and mother

outcomes, and contributing variables at AAU, 2024/5

Methods: - A Prospective cross- sectional study was used in Addis Ababa's 3 teaching hospitals. All women who experienced antepartum hemorrhage met the inclusion criteria were choosen unless the maximum sample size of 422 is reached. The data were collected by interview and chart review method. SPSS version 25.00 was used for entry and analysis of data. In order to identify factors that have been linked to the dependent variable, logistic regression analysis was implemented. Variables with a p-value of less than 0.05 were chosen as statistically significant using the 95% confidence interval.

Result: - The incidence of APH was 4.4%. Most affected women were multiparous (66.4%). Majority of the APH were caused by AP (61.2%) followed by PP (30.4%). Maternal complications occurred in 22.2% of APH cases, with anemia (76.1%), postpartum hemorrhage (26.1%), and hypovolemic shock (18.1%) being the most common. Cesarean delivery was performed in 78.4% of cases. Determinants of poor maternal outcomes included rural residence (AOR = 1.8), grand multiparity (AOR = 6.7), hypertensive disorders during pregnancy (AOR = 1.9), abnormal vital signs at admission (AOR = 12.2), and maternal age ≥35 years (AOR = 2.4). Poor composite perinatal outcomes were observed in 36% of cases. Among these, 4.5% were stillbirths. First and 5^{th} minute APGAR score were Low in 11% and 2.9% of live births, respectively. Low birth weight affected 23.9% of neonates, and 30% required NICU admission, mainly due to prematurity (40.1%) and low birth weight (39.4%). NICU mortality was 12.4%. Determinants of poor perinatal outcomes included maternal hypertensive disorders (AOR = 1.6), abnormal maternal vital signs (AOR = 6.3), maternal hemoglobin <11 g/dL (AOR = 2.9), and adverse maternal outcomes (AOR = 3.8).

Conclusion: APH poses a substantial risk to both maternal and perinatal health. Effective screening and early intervention, particularly in high-risk groups, are crucial to improving outcomes.

Keywords: - antepartum hemorrhage, maternal and fetal outcome, Addis Ababa University

1.Introduction

1.1 Background

Antepartum hemorrhage or APH is a word used to mean bleeding that happens before the conclusion of 2nd stage of labor but after the period of viability (28 weeks in sub-Saharan Africa, 20 weeks in the US). Bleeding until delivery after gestational age of 24 weeks is another definition of it (1-2). The estimated prevalence ranges from 2-5% and it is thought to be one of the significant contributors of fetal and mother mortality. High rates of neonatal and maternal morbidity as well as mortality are linked with this emergency condition. APH is responsible for 30% of maternal mortality, with 50% of those deaths being attributable to preventable causes (3). Even though the causes of APH are many the commonest are abruption placentae, Placenta previa, unknown causes or local reasons (4).

Placenta previa and placental abruption account for 0.8% and 0.7% of the 1.6% incidence, respectively. Previous C/D, previous placenta previa, multiparity Growing maternal age, multiparity, and prior abortion were predisposing risk factors. (5). Hypertensive disorders, Rupture of membrane, post term pregnancy, acquired or congenital abnormalities of the uterus, and previous history of APH are some of risk factors for APH. Women who are multiparous and have a history of preterm delivery are more likely to experience obstetric-related APH (6). APH has a number of potential repercussions or sequelae and is a major cause of death and morbidity among mothers and newborns. Oligohydramnios, premature membrane rupture, preterm labor/birth, cesarean birth, hemorrhagic shock, anemias, DIC, and PPH are among the risks that women who suffer APH are typically at. Intrauterine growth restriction, fetal/neonatal death, birth asphyxia, and congenital defects, are few more (7). About 30% of maternal death is due to hemorrhage, according to the CDC (8). The grade of abruption and the fetus's gestational age have a major impact on the outcome in AP. According to a review, the incidence of perinatal death, preterm delivery, and intrauterine growth restriction increased nine times, four times, and two times, respectively, when AP

complicated pregnancy (9).

Preterm delivery can account for the established correlation between APH and cerebral palsy, and As many as one-fifth of extremely preterm delivery are due to APH (10).

1.2 Statement of the problem

Approximately 830 women worldwide die each day from preventable events associated to child birth and pregnancy. Women from underdeveloped nations account for 99% of these deaths (11). Maternal deaths are primarily caused by direct obstetrical problems, with hemorrhage being the primary cause. Compared to 450 maternal deaths in underdeveloped nations, in developed areas, there are nine maternal fatalities for every 100,000 live births. (11).

Because of improved obstetrical outcomes in developed nations, antepartum hemorrhage-related morbidity and mortality among mothers and fetuses are considerably reduced. Fetal and Maternal death rates in Sub-Saharan Africa are unacceptable (12). In 2021, almost 295,000 women lost their lives during and after pregnancy and delivery, from this 94% of deaths took place in areas with limited resources, and the bulk of these deaths might have been avoided (WHO, 2023) (12).

Obstetric hemorrhage remains a major cause of mortality among mothers (13), and a major source of perinatal death (14). APH, constitutes one of the main causes of urgent clinic visits by women and affects 3.8% of pregnancies (15).

Postpartum bleeding (PPH), DIC, shock, and infections are among the maternal problems that can result from APH. Fetal or neonatal issues linked to APH include low birth weight/preterm birth, intrauterine fetal death, birth asphyxia and congenital anomalies, (16).

Various studies have reported varying results on mothers and neonatal death rates from antepartum hemorrhage. A study in 2013 conducted at the specialized hospital of Jimma University, substantial risks of maternal mortality (3.1%) and perinatal mortality (36.9%) were noted among APH. Among the complications of APH, the most commonly

diagnosed postpartum issues were postpartum bleeding which occurred in 37.4% and anemia which occurred in 38.0% of patients. 3.1% of patients with uncontrolled postpartum bleeding had a hysterectomy (17).

Examining the incidence of APH, outcome of the mother and newborns in women diagnosed with antepartum hemorrhage and delivered in the domain of region is the aim of this study.

1.3 Significance of the study

Evaluating the prevalence and consequences of APH will be crucial in providing knowledge to improve the mother's and the fetus's health. By lowering the risk of serious consequences, early diagnosis and prompt care are made possible by an understanding of the severity and outcome of APH. Significant maternal morbidity, such as hemorrhagic shock, the requirement for blood transfusions, and urgent surgical procedures, is linked to APH. Maternal death may result from severe situations. In order to create protocols to reduce these hazards and increase maternal survival rates, it will be essential to study APH.

Research on APH can help to better neonatal care practices, enhancing the odds of survival and long-term health for affected infants. The distribution of resources, including emergency services, is aided by knowledge of the strain that APH places on healthcare systems. Policymakers can use the findings as a guide to enhance healthcare provider training programs and infrastructure.

The results will give the evidence required to create or revise clinical protocols and guidelines for the treatment of APH. Public health policies aiming at lowering the incidence and enhancing the results of APH can be informed by the data from these studies.

2. Literature review

APH especially if it is significant hemorrhage and or due to placental abruption can cause fetal hypoxia and fetal heart beat abnormalities even fetal death. For this reason, if there are difficulties in detecting fetal heart beat on auscultation, an ultrasound scan is warranted (18). It is reasonable to generalize recommendations on how to approach a women presented with extremely preterm labor/birth with APH with specifically addressing keeping an eye on the fetal heart rate monitoring protocol (19).

One study found that 69% of women who experienced abruption of placenta had an aberrant fetal heart-rate pattern (FHRP) (20). In a carefully selected cases of APH in preterm pregnancies with reassuring fetal condition, expectant therapy seems to be safe; nevertheless, an aberrant CTG is linked to a bad fetal prognosis, so termination of pregnancy delivery should be accelerated (21). Because women who present with abnormal vital signs or ongoing massive bleeding may imply a disastrous occurrence, the baby is more susceptible to extreme oxygen deprivation and acidemia, clinical judgment is necessary in these situations (22).

2.1 Magnitude of antepartum hemorrhage

According to a study conducted in Chennai, Tamil Nadu, India, multipara people had a

higher incidence of APH (64%) than nullipara people. Compared to primipara, multiparous women have a rate PP approximately five times higher (23). According to a study conducted in tertiary medical facility, the incidence of APH is 2.35 percent. In this investigation, the prevalence rates of placental abruption, placenta previa, unidentified etiology of APH were, respectively, 0.94%, 1.17%, and 0.23% (24).

In another study 3.1% was the incidence of APH. The rate of maternal problems was 53.33% for placenta previa, 37.03% for abruptio placenta, and 66.66% for abruptio placenta. Ninety seven percent of women in the placental abruption group went home in good overall health, three percent had poor general health condition, and 100% of patients in the group of placentae previa went home in favorable general condition. The rate of perinatal mortality was around 27.3percent of which 24.3percent are still born and 3.0percent are early neonatal death in abruptio placenta group and 0 in the placenta previa group (25).

According to a study conducted in Nigeria, placenta previa and abruptio placenta were responsible for 39.2 percent and 46.8percent from the 5.8% prevalence of APH, respectively (26). Antepartum hemorrhage was present in 2.86% of cases. Commonest age group in which the majority of APH patients are found were 26 to 34 years. Multiparity was present in 77.2% and 65% of women with PP and AP respectively. APH often manifests between weeks 34 and 36 (27).

According to a study on the feto-maternal outcome of APH conducted in Addis Ababa, 358 women out of 9,643 deliveries received an APH diagnosis, indicating a 3.7% prevalence of the condition. The commonest diagnosis was placenta abruption which occurred in 2.3% of women, accounting for 61.7% of instances of APH. Those with uncertain etiology accounted for 21.5% of all APH cases, was the 2nd most prevalent etiology, occurring on 0.8percent of all cases. Forty-eight women, or 13.4 percent and 0.5percent of all cases APH, were diagnosed to have placenta previa. Mild abruption accounted for 51.1% of the placenta. with the cases with abruption, 25.8% were of the severe type and 23.1% were of the moderate kind. From the 48 mothers diagnosed to have placenta previa, 34 had the most frequent kind, placenta previa totals. Other types

of placentae previa (partials, marginals, and Low lying) were detected 4 (8.4%), 3 (6.2%), and 7 (14.6%) of women, respectively (28).

2.2 The maternal outcome of antepartum hemorrhage

According to research conducted at a tertiary care institution, 80% of PP patients presented with bleeding. Abdominal pain and vaginal bleeding (45%) were frequent symptoms of abruption placentae. At admission, the majority of patients (89%) had anemia. The majority of anemic individuals (49%) had hemoglobin values between 7 and 7.9 grams. Hb% levels were 7–7.9 in 50% of patients with placenta previa (24).

A study carried out in Nigeria found that from women having APH, three-fifths experienced anemia, 33.9 percent of patients had primary PPH, while 17.7 percent suffered from hypovolemic shock, and above one third (39.8%) received blood transfusions. Two maternal deaths (1%), 61 (31%) and 26 occurred.

Approximately 90% of APH patients needed blood transfusions. Overall, APH indicates a 62% rise in the rate of cesarean sections. 3.5% experienced postpartum hemorrhage (PPH), DIC occurred in around 4.7percent, 9.5percent experienced shock, and 8.3% experienced failure of surgical wound and puerperal fever (27).

Twelve women, or 3.4% of the total, were diagnosed with uterine rupture, according to a study on the feto maternal outcome of APH conducted in Addis Ababa. 16.2% of all women with APH had PIH. A prior uterine scar was observed in 39 women, accounting for 10.9% of the cases. Identification of PROM occurred in 8.6% of patients. Sixty-six percent of all deliveries with APH are cesarean sections. With 51.8% of cases, the most frequent reason for cesarean delivery was an unsettling fetal heart rate pattern. Seventy -one percent of women with abruptio placenta underwent cesarean sections, accounting for 69.6% of all cesarean sections performed for APH. With a rate of 93.8%, 45 cesarean sections were performed for placenta previa, accounting for 20.1% of the C.D. for APH. Five point eight % of cesarean sections for APH are due to APH of unclear origin, which had a 16.9% cesarean section rate. Three women had been diagnosed with DIC, two with AKI, three of then ended up in hysterectomy. ten patients were diagnosed to have hypovolemic shock and three moms were admitted into the critical care unit.

One mother passed away out of the three patients hospitalized within the critical care unit, with multi organ failure considered as most likely causes of death (28).

2.3 The perinatal outcome of antepartum hemorrhage

Premature births in seven of ten cases (before 34 weeks gestation) among individuals with APH was brought on by placental abruption, having a p-value less than 0.001, according to a Nigerian study. Eleven (5.6percent) early neonatal deaths and 61 (31%) stillbirths contributed to the perinatal mortality rate which is around 35.6percent (26). 23.8% of babies suffered asphyxia, with 60% of those kids falling into the PP group and 40% into the AP group, according an article about effects of antepartum hemorrhage on the mother and fetus. The 7.1% of infants with respiratory distress syndrome were evenly distributed between the two groups. 29.8% of patients had jaundice, and 13% had septicemia (27).

According to a study on the feto-maternal outcome of APH carried out in Addis Ababa, 358 mothers with APH gave birth to 367 neonates, of whom 95% were singletons. Individuals with APH had a exaggerated perinatal mortality rate which is 158 babies per 1000. From 367 babies, 3.5% died from early neonatal deaths (ENND), and 12.3% were stillborn. Out of the newborns, fifty-eight (16.6percent) were admitted into ICU due to preterm birth and low birth weight (28).

2.4 The determinant factor of maternal and perinatal outcome among APH

The aggregated general incidence of APH amongst pregnant women having placenta previa was 51.6 percent (95% confidence interval [CI], 42.7–60.6) (I2=97.9), according to a comprehensive review and meta-analysis of numerous research. The percentage of multiparous individuals and incidence had a positive link, determined by correlation analysis (RR=0.534, P=0.027) (29).

An investigation of the consequences of antepartum bleeding for mothers and

newborns with placenta previa, true PP raised the chance of APH (with OR: 2.1), although cervical length had an inverse relationship with APH (OR: 0.972). Additionally, the probability of APH was raised by a history of embolization of uterine artery (UAE) (odds ratio (OR): 11.71), an anterior placenta (OR: 1.664), and the partly lack of the surrounding myometrium (OR: 2.1) (27).

Based on an investigation carried out at public medical facilities located in Awi zone, found that mums who wait over twelve hours to seek care had a 2.6-fold increased risk of having a bad feto-maternal outcome (AOR = 2.57). The odds of adverse feto-maternal events were about 2.5 times higher for women lacking ANC follow-up than for those receiving ANC monitoring (AOR = 2.5). women above-35 years of age had 3.43-fold higher chance of experiencing unfavorable feto-maternal outcomes than those having less than 35 years of age (AOR = 3.43). Women living in rural regions had a 1.7-fold higher chance of experiencing adverse feto-maternal events than women living in metropolitan areaas (AOR = 1.7) (30). According to a local study conducted in Ethiopia, maternal problems are substantially correlated with inadequate access to comprehensive obstetric treatment (32).

2.5 Conceptual framework

Sociodemographic variables

Age, educational attainment, residency, marital status, and occupation

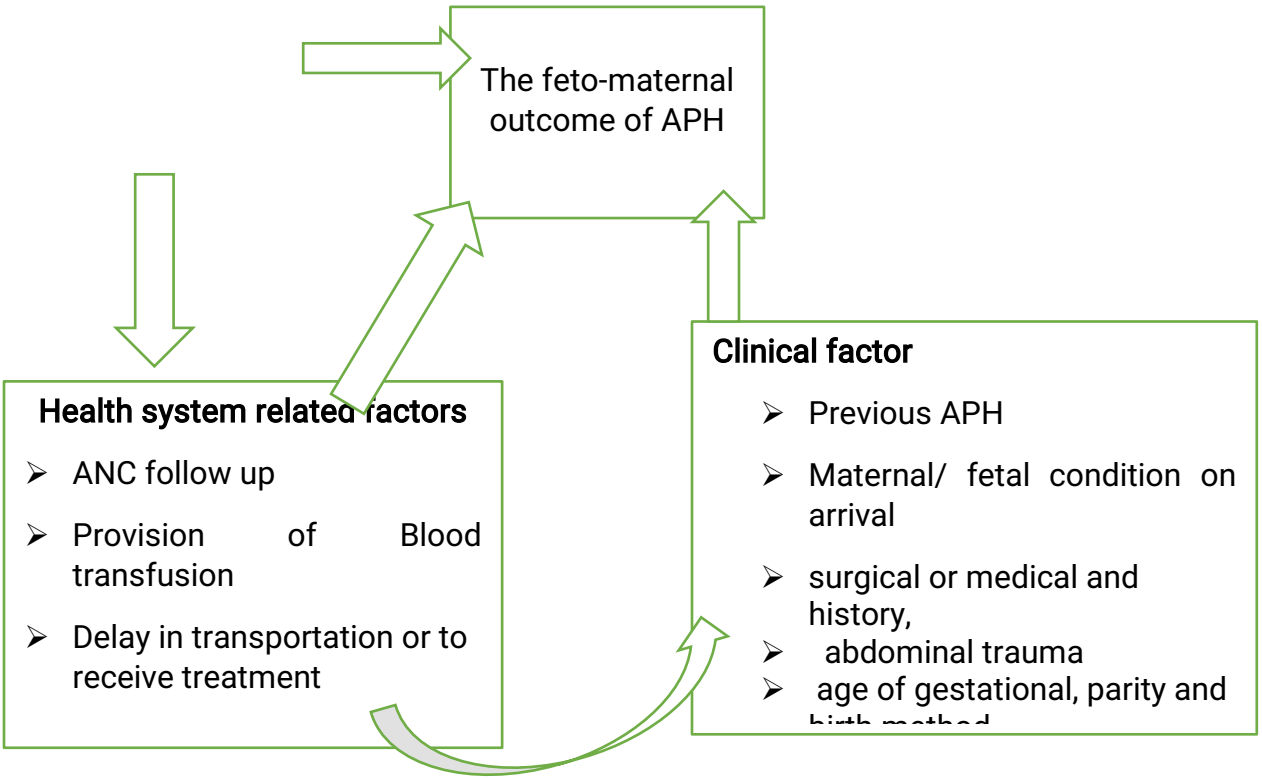

Figure 1. Conceptual framework of parameters linked to fetal and maternal outcome among moms diagnosed with antepartum hemorrhage - adopted from the literature.

3. Objective

3.1 General objective

To improve fetal and maternal health outcomes of antepartum hemorrhage by assessing the magnitude, associated factors and management outcome among pregnant women who is admitted at the 3 health facilities of AAU, 2024G.C

3.2 Specific objective

To identify the incidence of APH in women who delivered in Addis Ababa university's 3 teaching health facilities.

To ascertain outcome of mothers with APH among moms managed and delivered in Addis Ababa University's 3 teaching health facilities.

To ascertain the perinatal consequence of APH in moms who have given birth in Addis Ababa University's 3 teaching health facilities.

To find out factors related with outcome of mother in APH cases delivered at Addis Ababa University's 3 teaching health facilities.

To investigate factors related with outcome of fetus/newborn in APH cases delivered at Addis Ababa University's 3 teaching health facilities.

4. Methods and Materials

4.1. Study area and period

The research was carried out in Ethiopia's capital, Addis Ababa, which have a population

of 5 million people by 2024. There are currently over 500 clinics, 35 health posts, over 100 health facilities, and over 13 public and 27 private medical facilities within the town. Three out of twelve public medical facilities were specifically chosen to be part in the study. These are referral hospitals that receive patients from various parts of Ethiopia as well as high-risk and complex pregnancies from 70 public health centers.

Gandhi Memorial Hospital, Zewditu Memorial Hospital, and Tikur Ambessa Specialized Hospital (Addis Ababa University Hospital) are the hospitals where the study was conducted. The former two are regional hospitals connected to A.A University and run by the reginal Health Bureau. Pregnant women can receive complete care at these facilities, which also offer labor and delivery services, including vital care for mothers and newborns. This study was conducted for six months, starting on January 1 up to June,30, 2025.

4.2. Study Design

A health facility centered prospective cross-sectional study method was conducted on three teaching hospitals

4.3 Population

4.3.1 Source Population

Any pregnant mothers with a gestational age of at least 28 completed weeks who gave birth in Addis Ababa University's 3 educational hospitals.

4.3.2 Study Population

All pregnant mothers who are diagnosis to have APH and delivered their new born with in the study period at Addis Ababa university’s 03 academic hospitals.

4.4 Criteria for inclusion and Exclusion

4.4.1 Criteria of Inclusion

All pregnant women whose gestational age is ≥28 completed weeks irrespective of the

birth weight, who visited Obstetrics and Gynecology department and diagnosed to have APH and delivered their baby during the study period at the 03 hospitals are included in the study. If gestational age is not known, those having birth weight ≥ 1000gm is taken.

4.4.2 Criteria of Exclusion

Patients who are not diagnosed to have APH or with history of APH but delivered outside the study facility and patients who did not give consent to participate on the research.

4.5 Determination of Sample size

The single population proportion formula was used to get the sample size for this investigation. Using- 50.9% of the APH cases has developed adverse maternal outcome in a study done in Jimma Specialized hospital (31), to obtain the maximum sample size with margin error 5percent, 95% CI.

Formula used was $n=\frac{(Z_{1/2})^2 P(1-P)}{d^2}$

$n = (1.96)^2*0.509(1-0.509)/0.05)^2=384$

The ultimate sample size was 422 after a 10% non-response rate was added.

n= desirable sample size

Z (α/2) =the crucial value at 95% level of significance (1.96)

p= proportion of mothers having Adverse Maternal outcome (0.509)

d= precision of measurement (acceptable marginal error) (0.05)

4.6 Sampling Techniques and Procedures

This study included all moms who met the inclusion criteria and had a gestational age of at least 28 full weeks and had an assessment of APH and gave birth to their child during the study period until the maximum sample size.

4.7. Study Variables

4.7.1. Dependent variables

Magnitude and feto-maternal outcome of APH.

4.7.2. Independent variables:

Socio-demographic factors

Residence, Age, Religion, educational status, marital status, occupation

Health facility factors

- Delay in transportation or to receive treatment, ANC follow up

Clinical factors

Blood transfusion, cause of APH, fetal presentation, abnormalities in fetal heartbeat, ANC follow-up, history of abdominal trauma, delivery method, parity, gestational age, hypertension, previous C/D, history of dilatation and curettage, and women's vital signs at arrival, placenta previa and abruption history.

4.8 Instrument and Techniques Collection of Data

Data were gathered via in-person interview and reviewing the chart of women using, pre-tested data collection questionnaire. A structured questionnaire (Annex III) modified based on the findings of many APH studies was used. The questionnaire includes magnitude of APH, maternal and perinatal outcome of the mother and newborn, sociodemographic characteristics and obstetric characteristics of the participant. One general practitioner in each study setting was hired and instructed in the process of gathering data. Supervisors and data collectors received pertinent two-day training by the principal investigator to make them familiar with technique of interview, data gathering tool, sampling methods, eligible study subjects, and ethical considerations. Pretest was performed on 5 % of the sample at Ras Desta Damtew Memorial Hospital before starting of the actual time of data gathering. After the study subjects were informed about the study's goal using the information sheet and oral informed consent was obtained for the interview and the evaluation of their medical records by the data collector's data were gathered.

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Each participant was asked to answer the interview after providing their informed consent and being screened for exclusion criteria. The cases were picked in labor ward or maternity ward and data were collected from postnatal ward on the date of discharge in selected health facilities. One general practitioner was tasked with gathering data for each hospital.

Data collectors were under supervision, and the validity of the questionnaires was assessed every day by checking them for accuracy and completeness. The primary investigator took necessary action in the event that an issue arose throughout the data collection process.

4.9 Quality Control of the Data

To maintain the accuracy of the information, the questionnaire was initially created in English, translated into Amharic, and then translated back into English by many certified people. Prior to the actual data gathering time, supervisors and data collectors received two days of instruction on how to complete the questionnaire and the whole data gathering procedure. A pretest had taken place to 5% of the sample size at a comparable population in Addis Ababa, which was excluded from the study. Any necessary adjustments were made. Throughout the data collection process, data were verified every day for accuracy and consistency.

4.10 Interpretation and Analysis of Data

SPSS version 25 was used to clean and analyze the data. The study was summarized using mean and percentage summary statistics. Bivariate logistic regression models were built in order to evaluate the relationship between every study result and the various possible risk variables. The dependent variable's independent predictors were subsequently identified by applying multivariable logistic algorithms. The covariates were incorporated into an equation for multivariable regression modeling depending on

their bivariate correlation with the outcome, which comprised variables with a P-value less than 0.25. Crude and adjusted odd ratios had been utilized to quantify the degree of relationship between the various risk variables and the study results; a p-value of <0.05 was deemed to indicate the presence of an association with statistical significance.

4.11 Ethical consideration

The proposal was presented to the OBGYN department ethical clearance and approval was obtained from the DRPC. The goal of the investigation was explained to each and every participant. Using a sheet of information (annex 1) verbal consent was taken prior to the interview for this consent letter is attached to each questionnaire's cover page, this was observed by the data collector(annex2). We told the participant it takes less than 50 minutes and what the question is about and that it is not part of your evaluation. The respondents were made aware of that they have a power to refuse enrolment or discontinue their participation at any time of research, and the data given by every participant were kept private. Additionally, the result generation was written in aform not to refer a specific respondent.

4.12 Operational Definition

Adverse maternal outcome: -A mother having complications related to antepartum hemorrhage which includes severe anemia, post partum hemorrhage, shock, admission to ICU, renal injury, blood transfusion, DIC, peripartum hysterectomy, and even death or complications related to management of APH like, complications of blood transfusion, sepsis or venous thromboembolism, until discharge.

Adverse perinatal outcome: - (intrauterine fetal death/still birth), delivered with APGAR<7, delivered at gestational age <37 weeks, Admitted in NICU or early neonatal death (death before discharge)

Perinatal mortality: defined as death of a fetus at ≥ 28 weeks of intrauterine life or death of new born before discharge (from LW or NICU), but at or before 7 days of life.

Prolonged Hospital Stay: women kept in the ward for greater than 1 day for vaginal delivery or 3 days in case of cesarean delivery.

4.13 Dissemination of findings

Following data collection and analysis in accordance with the work plan, open defense and discussion was conducted at AAU OBGYN department. Result will be shared with the public and the relevant body after taking into account the examiner's comments and obtaining approval from the relevant authority. Publication of the results will also be taken into consideration.

5. Results

5.1 The sociodemographic characteristics

A total of 414 respondents were included in this study, resulting in a percentage of response of 98.1%. Having a mean age of 29.76 ± 4.39 years, 50.7% of the participants were between the ages of 20 and 29, and 92% of them were from metropolitan regions. Of the participants, 57% were housewives, 96.9% were married, and half were Orthodox Christians. Of them, 36 percent had finished secondary school, and 43.5% earned between 5,000 and 10,000 ETB each month.

Table 1. Sociodemographic characteristics

Variables	Categories	Frequency	(%) Percentage
Residency	Urban	381	92
	Rural	33	8
Maternal age in years	20-29	210	50.7
	30-34	125	30.2
	≥35	79	19.1
Religion	Muslim	145	35.0
	Orthodox	211	51.0
	Catholic	7	1.7
	Protestant	51	12.3

Marital status	Married	401	96.9
	Unmarried	13	3.1
Occupation	House maker	236	57.0
	Government employee	107	25.8
	Merchant	39	9.4
	Daily laborer	32	7.7
Educational background	Not literate	21	5.1
	Enrolled in classes 1-8	120	29.0
	Enrolled in classes 9-10	149	36.0
	Collage and above	124	30.0
House hold monthly income	<5000	32	7.7
	5000-10000	180	43.5
	10000-15000	92	22.2
	>15000	110	26.6

5.2 Obstetric related characteristics

Most of (67.9%) of the respondents were multiparous, and among 80.4% of participants had bleeding from the vagina. Almost 94% of participants had ANC follow -up, and 18.1% had hypertensive disorders during the current pregnancy. Previous cesarean delivery (CS) history was identified in twenty-seven percent of participants, 1.9% (n=8) had placenta previa history and two participants had abdominal trauma. Sixty- one percent of them had a gestational age less than 37 weeks. while 32.4% of patients were admitted with a gestational age of < 34 weeks

Table 2. Obstetric Related Variables

Variables	Category	Frequency	Percent
Gravidity	I	121	29.2
	II-IV	281	67.9
	≥V	12	2.9
Parity	I	130	31.4
	II-IV	275	66.4
	≥V	9	2.2
Initially compliant of the patient	Pushing down pain	37	8.9
	leakage of liquor	32	7.7
	Vaginal bleeding	342	82.6

	Elevated blood pressure	3	.7
Arrival at the present medical center is delayed by more than 12 hours.	Yes	72	17.4
	No	342	82.6
Place of delay (n=72)	Delay in choosing to seek medical attention	46	63.9
	Delay of gaining adequate or appropriate treatment.	11	15.3
	Delay in getting transport	15	20.8
History of ANC follow up	Yes	387	93.5
	No	27	6.5
Number of ANC (N=387)	<8	364	94.1
	≥8	23	5.9
Hypertensive disorder in this pregnancy	Yes	75	18.1
	No	339	81.9
Previous history of CS delivery	Yes	114	27.5
	No	300	72.5
Previous history of abortion	Yes	8	1.9
	No	406	98.1
History of APH	Yes	8	1.9
	No	406	98.1
History of trauma of abdomen	yes	2	0.5
	No	412	99.5
Weeks of gestational age	<34	134	32.4
	$34\text{-}36^{+6}$	121	29.2
	$37\text{-}38^{+6}$	80	19.3
	$39\text{-}40^{+6}$	49	11.8
	$41\text{-}41^{+6}$	17	4.1
	≥42	13	3.1

5.3 Physical examination

Eleven percent (n=46) had derangement in vital sign at presentation and 5.8% were breech presentation. Reassuring FHB at presentation was observed in 83% of subjects and 12.1% were a hemoglobin level of <11g/dl. RFT was done for 65% participants and from those of having RFT, 97.8% had normal creatinine. Thirty-five percent of the participants had coagulation profile and from those of having coagulation profile, 98.7% had in normal range. Sixty-one percent of the APH were caused by AP followed by PP (30.4%), while 7.2% were unidentified and 1.9 % was other causes. Among those having PP (n=126), 80.2% were true PP and from those having AP (n=253), 54.1% had grade II detachment of the placenta. Table 3. Physical examination

Variables	Categories	Frequency	Percentage
Vital sign at presentation	Normal	368	88.9
	Deranged	46	11.1
Fetal presentation	Cephalic	390	94.2
	Breach	24	5.8
FHB at presentation	Normal	344	83.1
	Abnormal	55	13.3
	Negative	15	3.6
Hgb	≥11	364	87.9
	<11	50	12.1
Is RFT done?	Yes	269	65
	No	145	35
If yes, what is the result of creatinine? (n=269)	≤1.1	263	97.8
	>1.1	6	2.2
Is the Coagulation profile done?	Yes	155	37.4
	No	259	62.6
If yes, is the result normal?	Yes	153	98.7
	No	2	1.3
Cause of APH	AP	253	61.2

	PP	126	30.4
	Unknown cause	30	7.2
	Other	5	1.2
Types of PP (n=126)	True PP	101	80.2
	Low-lying placenta	25	19.8
Class of AP (n=253)	I	97	38.3
	II	137	54.1
	III	19	7.5

5.4 Antepartum bleeding management

Seventy percent of the cases were admitted to the ward, and among those admitted, 39% stayed in the ward for 1 to 2 weeks. Of those admitted, 70.3% received corticosteroids. Seventy-eight percent of the participants delivered by cesarean section (CS), while 21.7% delivered vaginally, 51.1% experienced spontaneous labor onset.

Table 4. Antepartum bleeding management related characteristics of the study participants

Variable	Categories	Frequency	Percent
Admitted to maternity ward	Yes	290	70
	No	124	30
Duration of admission in weeks (n=290)	<1	59	20.3
	1-2	113	39
	3-4	34	11.7
	>4	84	29
Was the mother given Corticosteroids	Yes	204	70.3
	No	86	29.7
Mode of delivery	Cesarean delivery	324	78.3
	Vaginal delivery	90	21.7
Mode of labor initiation for vaginal	Induced	44	48.9

delivery (n=90)	Spontaneous	46	51.1

5.5 The incidence of antepartum hemorrhage

Overall, 9428 births were attended throughout the investigation timeframe. Among those 414 had APH with an incidence rate of 4.4%

5.6 Perinatal outcome related characteristics of the study participants

Ninety- seven percent (n=401) of the study participants had a single pregnancy outcome, while 3.1%(n=13) had twin pregnancy outcomes, resulting in a total perinatal count of 427. Among the 427 perinates, 50.8% were male, and 4.5%(n=19) were stillbirths. Eleven percent of the live births had a 1minute APGAR score of 1-6. Eleven cases of perinatal outcomes were VLBW and 23.9% had LBW. Thirty four percent of newborns were admitted into intensive care unit, and among those admitted, prematurity contributed to 0.1%, followed by LBW (39.4%) and perinatal asphyxia (10.9%). Of the neonates admitted to the NICU, 12.4% died.

Table 5. Perinatal outcome

Variables	Categories	Frequency	Percentage
Number of neonates delivered	Single	401	96.9
	Twin	13	3.1
Sex of the neonate (n=427)	Male	217	50.8
	Female	210	49.2
Delivery outcome(n=427)	Alive	408	95.5
	Died	19	4.5
First minute APGAR(n=427)	≥7	361	84.5
	1-6	47	11
	0	19	4.5
Five-minute APGAR (n=408)	≥7	396	97.1
	1-6	12	2.9

Birth weight(n=427)	<1500	11	2.6
	1500-2499	102	23.9
	2500-3999	313	73.3
	≥4000	1	0.2
NICU admission(n=408)	No	274	66.4
	Yes	137	33.6
Indication for admission (n=137)	Prematurity	55	40.1
	LBW	54	39.4
	Birth asphyxia	15	10.9
	Respiratory Distress	7	5.1
	Neonatal Sepsis	6	4.4
Neonatal condition at discharge (n=137)	Improved	120	87.6
	Died	17	12.4

5.7 Composite perinatal outcome of the study participants

According to the chart below, 64% of perinatals had positive perinatal outcomes, whereas 36% had negative ones.

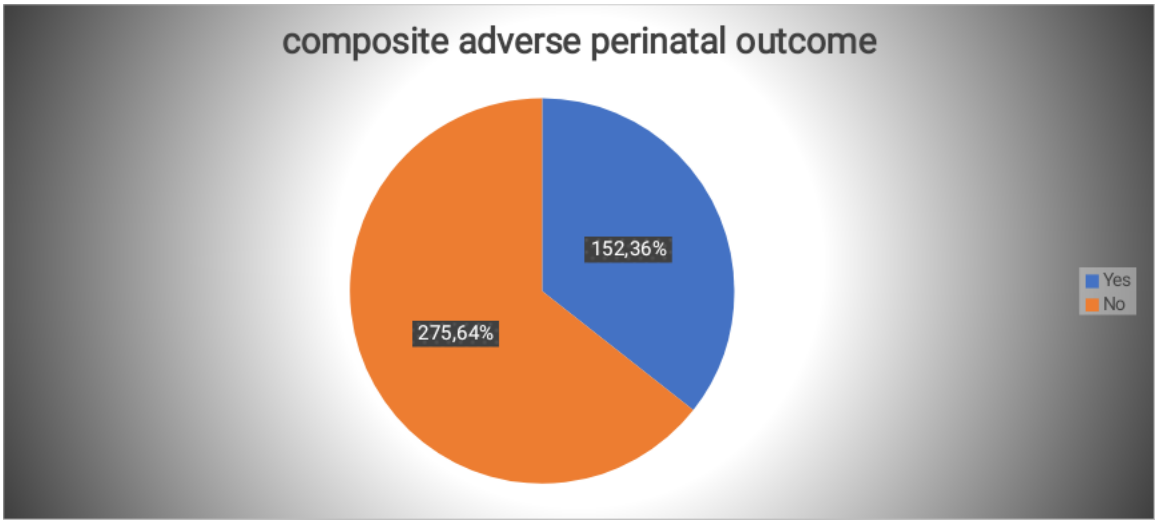

Figure 2. Composite adverse perinatal outcome among women complicated by antepartum hemorrhage.

5.8 The determinant factors of adverse perinatal outcome

The following factors were linked to perinatal outcomes in bivariate logistic regression: residence, age, education level, ANC follow-up, hypertensive disease of pregnancy, vital signs at admission, admission hemoglobin level, length of ward hospitalization, and negative maternal outcomes. Maternal age ≥35 years was related to 2.4 times greater chances of adverse perinatal outcomes (APO) than ages twenty–twenty-nine years (with AOR = 2.4; 95% Confidence interval: 1.13–5.13), according to multivariate logistic regression. The risks of APO were roughly 1.6 times greater in pregnant women with hypertensive disorder than with those without the illness (95% CI: 1.16–3.82; AOR = 1.6). The likelihood of APO were 6.3 times greater for mothers with abnormal vital signs at admission than for those with normal vital signs (95% CI: 1.82–22.00; AOR = 6.3). Admission hemoglobin levels <11 g/dL increased the odds of APO by 2.9 times compared to levels >11 g/dL (AOR = 2.9; 95% CI: 1.08–7.93).

Ward admission less than one week was linked to 2.5 times the likelihood of developing APO in contrast to admission longer than weeks (AOR = 2.5; 95% CI: 1.08–5.). The odds of APO were 3.8 times higher for those having a negative maternal outcome than for those with a normal one (AOR= 3.8: 95% confidence interval [CI]: 1.79-7.92).

Table 6. Th relationship between the independent variable and the perinatal outcome using both bivariate and multivariate logistic regression

Variables	APO		P-value	COR and 95%CI	P-value	AOR and 95%CI
	Yes	No				
Residency						
Urban	121	260	1		1	
Rural	18	15	0.021	2.57(1.14, 4.77)	0.137	2.6(0.74, 8.80)
Age in years						
20-29	74	147	1		1	
30-34	33	92	0.172	0.71(0.44, 1.16)	0.196	0.61(0.29, 1.29)
≥35	45	36	0.001	2.5(1.48, 4.18)	0.022	**2.4(1.13, 5.13)**
Education level						
Illiterate	10	11	0.152	1.9(0.78, 5.06)	0.163	3.3(0.62, 17.95)
Primary	61	66	0.008	2.0(1.21, 3.37)	0.122	1.8(0.86, 3.65)
Secondary	42	113	0.426	0.81(0.48, 1.36)	0.039	0.44(0.20, 0.96)
Collage and above	39	85	1		1	
ANC follow up						
Yes	137	263	1		1	
No	15	12	0.029	2.4(1.09, 5.27)	0.143	3.4(0.66, 18.10)
Hypertensive disorder in pregnancy						
Yes	46	31	0.000	3.4(2.05, 5.68)	0.026	**1.6(1.16, 3.82)**
No	106	244	1		1	
Maternal vital sign						
Normal	115	266	1		1	
Deranged	37	9	0.000	9.5(4.44, 20.34)	0.004	**6.3(1.82, 22.00)**
Admission hemoglobin						
<11	27	23	0.005	2.4(1.30, 4.29)	0.035	**2.9(1.08, 7.93)**
≥11	125	252	1		1	
Duration of ward admission in weeks						

<1	28	31	0.002	3.1(1.50, 6.25)	0.033	**2.5(1.08, 5.64)**
1-2	35	83	0.267	1.4(0.76, 2.71)	0.818	1.1(0.52, 2.31)
3-4	14	20	0.044	2.4(1.02, 5.54)	0.801	1.2(0.39, 3.35)
>4	20	68	1		1	
Adverse maternal outcome						
No	89	241	1		1	
Yes	63	34	0.000	5.0(3.09, 8.13)	0.000	**3.8(1.79, 7.92)**

5.9 Maternal outcome

Twenty-two percent women have adverse composite maternal outcome as displayed in the image.

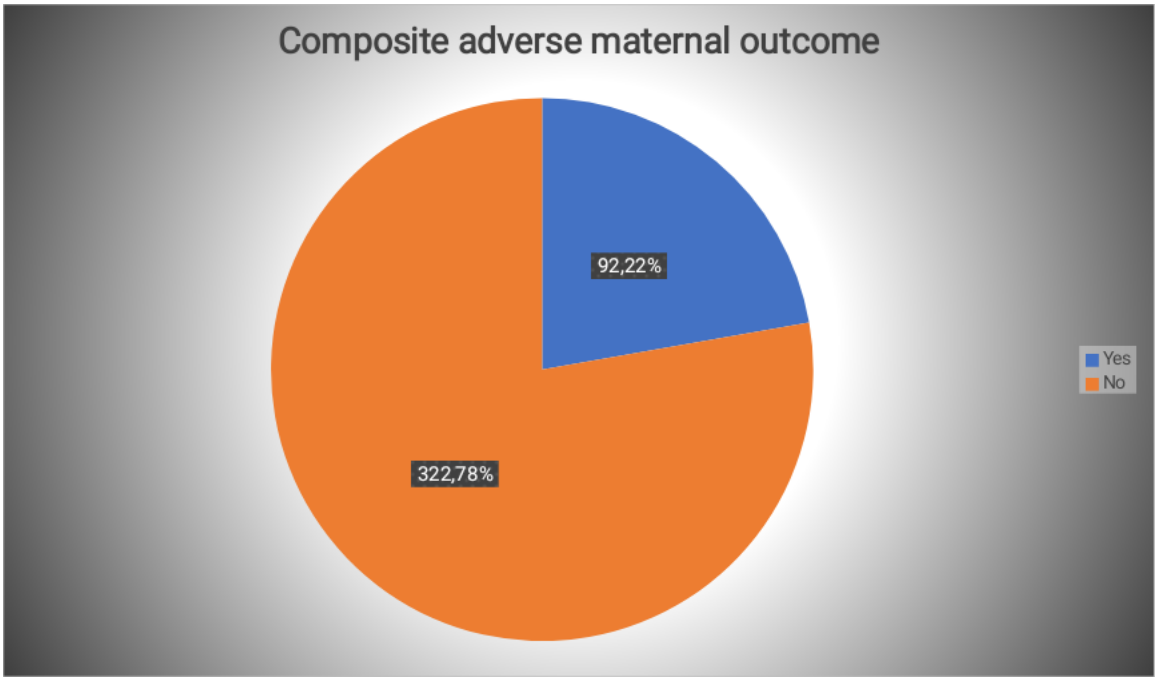

Figure 3. Composite adverse maternal outcome among women complicated by antepartum hemorrhage.

Among those with adverse maternal outcomes 76.1% had anemia, 26.1% had postpartum hemorrhage (PPH), and 18.5% experienced hemorrhagic shock and 10.9% had hysterectomy. From the total APH cases 12.8% received blood or blood product transfusions. Four percent of the study participants were admitted to the ICU, and all of

them improved and were discharged.

Table 7. Maternal outcome

Variables	Categories	Frequency	Percentage
Any adverse maternal outcome	Yes	92	22.2
	No	322	77.8
If yes what was the adverse maternal out come	Anemia	73	76.1
	DIC	9	9.8
	Hemorrhagic shock	17	18.5
	Hysterectomy	11	10.9
	PPH	25	26.1
	AKI	1	1.1
Was she transfused with blood or blood products	Yes	53	12.8
	No	361	87.2
Admitted to ICU	Yes	16	3.9
	No	398	96.1
Duration of hospital stay (in days)	≤1	54	13.0
	2-3	185	44.7
	≥4	175	42.3
Condition of the mother at discharge	Improved	414	100

5.10 The determinant factors of adverse maternal outcome

Residency, maternal age, gravidity, ANC follow-up, hypertensive disorder in the current pregnancy, vital sign status at admission, hemoglobin level at admission, and delivery method were liked with adverse maternal outcomes (AMO) on bivariate logistic regression. Multivariate regression showed the odds for AMO were one point eight times greater among participants living in rural areas in contrast to those living in urban (AOR = 1.8, 95% CI: 1.48–4.49). Grand multiparous women have probabilities that were 6.7 times greater AMO in contrast with primigravida (AOR = 6.7, 95% CI: 1.56–20.80).

The odds of AMO were 1.9 times greater for those with hypertensive problems during pregnancy than for those without (AOR = 1.9, 95% CI: 1.29–3.67). Participants with abnormal vital signs at admission had 12.2 times higher odds of AMO in contrast to those without vital signs derangement (AOR = 12.2, 95% CI: 5.31–27.97).

Table 8. The relationship between the independent variable and maternal outcome using both bivariate and multivariate logistic regression

Variables	AMO		P-value	COR (95%CI)	P-value	AOR (95%CI)
	Yes	No				
Place of stay						
Urban	79	302	1		1	
Rural	13	20	0.016	2.5(1.18, 5.21)	0.042	**1.8(1.48, 4.49)**
Age in years						
20-29	37	173	1		1	
30-34	29	96	0.215	1.4(0.82, 2.44)	0.808	0.92(0.46, 1.83)
≥35	26	53	0.006	2.3(1.27, 4.13)	0.456	1.3(0.63, 2.78)
Gravidity						
I	21	100	1		1	

II-IV	63	218	0.253	1.4(0.79, 2.38)	0.609	1.2(0.62, 2.24)
≥V	8	4	0.001	9.5(2.62, 34.57)	0.011	**6.7(1.56, 20.80)**
History of ANC follow-ups						
Yes	81	306	1		1	
No	11	16	0.020	2.6(1.16, 5.81)	0.488	1.5(0.50, 4.23)
HTN disorder in this pregnancy						
Yes	32	43	0.000	3.5(2.03, 5.91)	0.047	**1.9(1.29, 3.67)**
No	60	279	1		1	
Vital sign at admission						
Normal	59	309	1		1	
Deranged	13	33	0.000	13.3(6.61, 26.76)	0.000	**12.2(5.31, 27.97)**
Admission hemoglobin						
<11	20	30	0.02	2.7(1.45, 5.04)	0.559	1.3(0.55, 3.06)
≥11	72	292	1		1	
Mode of delivery						
CS	80	244	0.024	2.1(1.10, 4.12)	0.113	1.9(0.86, 3.99)
Vaginal	12	78	1		1	

6. Discussion

The incidence rate of APH was 4.4% according to the result of this thesis, comparable to researches from Udaipur, Rajasthan, India (3.1%) (25), Nigeria (5.8%) (26), and Addis Ababa (3.7%) (28). These consistent findings imply that the burden of APH is similar across a range of settings with low and moderate incomes. The incidence found in this study, however, was more than that found in Adodara, Gujarat, India (2.56%) (27) and in a tertiary care hospital setting (2.2%) (24). The higher incidence in these studies may be due to differences in the study settings, which may lead to earlier management and prevention of complications that could otherwise result in APH.

Multiparous women made up 66.4% of the women who had been diagnosed with antepartum hemorrhage (APH) in this study. This finding aligns with a study conducted in Chennai, Tamil Nadu, India (23). The increased incidence of APH among multiparous women may be due to multiparity is also linked with a substantial chance of hypertensive disorders, anemia, and uterine overdistension, all may contribute to the development of APH.

This study found that abruption placentae was the leading cause of APH, accounting for 60% of cases, followed by placenta previa at 30%. This distribution is in accordance with findings from Udaipur, Rajasthan, India (25), also Adodara, Gujarat, India (27). The predominance of abruptio placenta in these settings may be related to shared underlining reason such as hypertensive disorders, advanced age of mother, high parity.

In our research, severity of (APH) were classified as mild on 36.2%, moderate on 51.3%, and severe on 12.5% of cases. This pattern closely aligns with findings from researches done in A.A [28], indicating majority of APH cases fall into the moderate category. The predominance of moderate severity may reflect delays in care-seeking behavior or referral, especially in regions where receiving timely obstetric services is a challenge.

On our study, 80.6% of women with APH presented with vaginal bleeding as the primary complaint. This result aligns with research done at an institution that provides tertiary care (24) also in Addis Ababa (28). This was may be due to vaginal bleeding is the hallmark clinical sign of APH and often prompts urgent medical attention.

Twenty two percent of women with APH experienced problems, with anemia being most

prevalent (76.1%), followed by postpartum hemorrhage (PPH) at 26.1% and hypovolemic shock at 18.5%. This result aligns with research done in Nigeria (26). Anemia on APH cases often results from acute blood loss compounded by preexisting nutritional deficiencies common in low-resource settings. Postpartum hemorrhage and hypovolemic shock are serious, potentially life-threatening conditions that underscore the urgent requirement for rapid action as well as effective blood transfusion strategies. The cascade of hemorrhage and surgical rescue: The clustering of PPH (26.1%), hemorrhagic shock (18.1%), and hysterectomy (10.9%) maps a familiar escalation: Placental pathology → major bleeding → shock → uterotonic/balloon/surgical measures → peripartum hysterectomy in refractory cases. The hysterectomy proportion among AMO is substantial, suggesting timely access to surgical rescue was used to control life-threatening bleeding

In this study, a high proportion of mothers with APH, 78.4% were delivered via c.section. This result is in harmony with researchs from Adodara, Gujarat, India (62%) (27) and Addis Ababa (77%) (28), where cesarean delivery rates among APH cases were also elevated. The predominance of CS in APH management reflects the urgency to avert negative pregnancy and fetal consequences in related to compromised placental function or fetal distress. Cesarean delivery is often preferred to rapidly control bleeding, especially in cases of severe placental abruption or placenta previa.

In this study, 36% of cases experienced poor composite perinatal outcomes. Among these, 4.5% were stillbirths. Additionally, 11% of live births got a low APGAR score at first minute (1–6), and 2.9% had got a low APGAR score at 5-minute. These results match with previous research undergone in Nigeria, Jimma as well as Addis Ababa. These findings reflect compromised fetal well-being likely due to placental insufficiency and hypoxia secondary to bleeding and placental abnormalities highlighting the significant burden of morbidity and mortality associated with APH. However, the finding is greater than an investigation conducted in Ethiopia's eastern region- 21% neonatal death proportion (4.5%) and is higher than population NMR (2.65%)-due to referrals and complicated births.

In this study, eleven neonates were classified as very low birth weight, while 23.9% had low birth weight. These results match with research carried out in Nigeria (27) and Jimma, Ethiopia (31). These conditions significantly increase the chance of newborn morbidity and mortality, implies the requirement for improved maternal health interventions, including early detection and management of APH, to optimize fetal growth and birth outcomes.

In this study, 33.6% of neonates born to mothers with APH required admission to the NICU. Among these admissions, 40.1% were due to prematurity, 39.4% due to low birth weight, and 10.9% due to birth asphyxia. The NICU mortality rate was 12.4%. These findings are broadly consistent with studies from Nigeria (27), Addis Ababa (28), and Jimma (31), which similarly reported Low birth weight and preterm as the main factors contributing to newborn morbidity following APH. The study found that the odds of adverse maternal outcomes (AMO) were nearly two times greater for rural-dwelling mothers than among urban-dwelling women (AOR -1.8, 95% Confidence interval: 1.48–4.49). This result is consistent with a related study carried out in the Awi zone (32). The higher risk in rural areas could be attributed to restricted availability of high-quality antenatal care, delays on reaching health facilities, and less access to urgent maternity care.

According to this report, grand multiparous women have probabilities that were 6.7 times higher

Chance for experiencing AMO in contrast to primigravida women (AOR = 6.7, 95% CI: 1.56–20.80). Material from a comprehensive review and meta-analysis supports this conclusion (29), which also identified one of important contributory factor of maternal problems is grand multiparity. The increased risk may be due to factors such as uterine overdistension, diminished uterine contractility, and higher likelihood of obstetric complications including placenta previa and abruption placentae among women with multiple previous pregnancies.

Participants with hypertensive disorders during pregnancy had 1.9 times the likelihood of experiencing AMO in contrast to those without hypertensive conditions (AOR -1.9 with 95% Confidence interval: 1.29–3.67). The above association reaffirms the

significant infulence of hypertensive disorders on maternal health, as these conditions can exacerbate complications related to antepartum hemorrhage, such as placental abruption and increased bleeding risk.

Maternal age of 35 years or older was associated with 2.4 times greater odds of poor perinatal outcomes (APO) in contrast to moms aged 20–29 years (AOR - 2.4; with - 1.13–5.13, 95% CI). This result is consistent with research that was in the Awi zone (32). Older maternal age is often linked to increased risks of pregnancy complications such as hypertension, diabetes, and placental abnormalities, all of which can negatively affect fetal development and survival.

Pregnancy-related hypertension was linked to 1.6 times higher risks of adverse perinatal results (APO) during pregnancy compared to pregnancies without hypertension (AOR - 1.6; 1.16–3.82, 95% CI). The above result reflects well-established link between hypertensive conditions such as preeclampsia and gestational hypertension and complications like intrauterine growth restriction, preterm birth, and stillbirth.

Having abnormal maternal vital signs at admission was associated with 6.3 times higher odds of APO in contrast to individuals whose vital signs are normal (AOR - 6.3; 95% CI; 1.82–22.00). This significant association indicates that maternal physiological instability on presentation, such as altered blood pressure, pulse rate, or respiratory status, may reflect severe maternal compromise that directly impacts fetal well-being.
Admission hemoglobin levels below 11 g/dL were connected to 2.9 times 2.9 times increased odds for APO in opposition to levels above 11 g/dL (95% CI: 1.08–7.93; AOR = 2.9). Low hemoglobin levels can impair oxygen delivery to the fetus, increasing the possibility of low birth weight, preterm delivery, and fetal growth limitation.

Having an AMO was linked to probabilities that were 3.8 times higher adverse perinatal outcomes (APO) in opposition to women having normal maternal outcomes (95% CI: 1.79–7.92, AOR = 3.8). This strong association highlights the interconnected nature of maternal and perinatal health, where complications affecting the mother such as severe

hemorrhage, hypertensive disorders, or shock can directly compromise fetal well-being.

7. Conclusion

The incidence of APH according to our study was 4.4% during the study period. The majority of APH cases occurred among multiparous women (66.4%). Among the APH cases, 22.2% of mothers developed complications, with anemia (76.1%), postpartum hemorrhage (26.1%), and hypovolemic shock (18.5%) being the most common. A high rate (78.4%) of cesarean deliveries was observed among affected mothers. Key determinants of poor maternal outcomes included rural residence, grand multiparity, hypertensive disorders during pregnancy, abnormal maternal vital signs at admission, and advanced maternal age (≥35 years).

Regarding perinatal outcomes, 36% of the neonates had poor outcomes, including 4.5% stillbirths, low APGAR scores, low birth weight (23.9%), and NICU admissions (33.6%). Among NICU admissions, the leading reasons were low birth weight and prematurity, with 12.4% neonatal death rate in the NICU. Determinants of poor perinatal outcomes were maternal hypertensive disorders, abnormal vital signs at admission, low maternal hemoglobin levels (<11 g/dL), and adverse maternal outcomes.

8. Recommendations

- ✓ Prioritize close monitoring and antenatal follow-up for high-risk factors such as hypertensive disorders, anemia, grand multiparous and if age of the mother ≥35 years.
- ✓ Equip NICUs to handle common complications of APH such as perinatal asphyxia and low birth weight/prematurity.
- ✓ Train healthcare providers on neonatal resuscitation as well as postnatal care to reduce NICU mortality.

9. Limitation of study

Lack of clear documentation on the diagnostic criteria for placenta abruption and idiopathic APH was the main limitation of the study

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Annexes

Annex 1: Participants' information sheet

_____ is my name. Dr. Biniyam Denekew is carrying out research

for the Department of Obstetrics and Gynecology at Addis Ababa University in order to partially fulfill the prerequisites for a Specialty Certificate in Gynecology and Obstetrics, and I am serving as a data collector for this study. The purpose of this study is to evaluate the rate and related elements of your current issue. Your current pregnancy issue is the reason you were chosen to take part in this trial. Therefore, I respectfully ask to give me some of your time so that I can explain the study to you. I would like honest opinion pertaining to the questions

Procedure: At first, I will explain to you about the research and the conditions for your participations. If you're open to taking part in our study, I'll conduct an interview with you and collect data from your medical record. The interview and clinical record review are not part of your ongoing medical care. Your ongoing medical care will not be affected if you don't participate.

Discomfort or Risk of participation: Engaging on this study may cause you to feel uncomfortable, particularly if it wastes your time (about fifty minutes) or causes psychological discomfort.

Benefit; Although you might not directly profit from taking part in this study endeavor, it is likely to be beneficial as for prevention and management of APH-related complications by detecting the determinant risk.

Incentive; There won't be any sort of reward for your involvement in this project.

Anonymity and confidentiality: We will maintain the confidentiality of the data we gather for this study. Your personal data gathered will be kept in a file with a code number issued to it instead of your name, address, phone number, or health care record number. The chief investigator alone will be the only one to know.

The ability to decline or withdraw: Your health services at any medical care provider will not be impacted if you choose not to participate in this study, which gives you complete control over whether or not to answer any or all of items. Additionally, you are free to leave this study whenever you like, without compromising your privileges as a facility client.

Contact information: You can get in touch with them at any moment when you want to ask questions.

Name:- Dr Biniyam Denekew

phone number: +251931355826

Annex 2. Consent form of the participants

I have received written details regarding this research project and have gotten completely aware of its purpose. I am also aware that the outcome will aid to enhance the antepartum hemorrhage outcomes for both the mother and the fetus. I am aware that taking part in this study carries very little risk. I consented to take part in the current research, to be interviewed, and to have my clinical records' data examined. I am aware that through taking part, I am not eligible for any special treatment, compensation, or rewards. I was informed that the data collected would be kept private. I am aware that any details that could be used to identify me will not be used in any publications or reports. Only this study is covered by this authorization.

Would you be open to taking part in the study? First- Yes; Second- No

Thank you if the response is yes! Do the interview. Thank you if the response is no!

Avoid pressuring or pressuring someone to complete the survey.

I_____ (Name of the interviewer) has informed the participants as written is the information and responded to her questions and interviewed her by respecting all the research participant's right

The code used by the interviewer --------- name ---------- signature -------
Interview date ---------- date ---------- month of 2017 E. C.
Interview time started at _____ hours:minutes
Interview completion time: _____ hours: minutes

Confirmed on the date ----------. ----------month of 2017 E.C.

If complete: 1

If Incomplete: 2 Other (specify) ----

Annex-3: Questionnaire

Annex 3.1: English version of Questionnaire

The following is the survey that will be employed in the research titled, "magnitude and associated factors of APH at AA, Ethiopia."

001. code _____

002. date_____

Part 1. Identification

1. Residency: (1) urban, (2) rural

2. Age in years _____

3. Ethnicity: (1) Oromo, (2) Amhara, (3) others, mention---.

4. Religion: (4) other, mention ---------, Protestant (3), Orthodox (2), Muslim (1)

5. Status of marriage: married (1), unmarried (2), widowed (3)

6. Occupation: homemaker (1), A government employee (2), student (3), merchant (4), (5) daily laborer

7. Educational background: Not literate (1), Enrolled in classes 1-8 (2), enrolled in grades9-10 (3), Collage and above (4)

8. house hold monthly income in birr_____

Part 2. Obstetric and Gynecologic History

1. Weeks of Gestational age

1.1. LNMP is known: (1) yes, (2) no

1.2. If yes, what is the GA is weeks -----28 -33+6wks (1), 34-36+6weeks (2), >/=37weeks (3)

1.3. If no, GA using ultrasound ---------- (1) -28-33+6wks, (2)-34-36+6wks, (3)>/=37wks

1.4 If no ultrasound, GA by measurement of fundal height---------cm/finger (1) -28-33wks, (2)-34-36wks, (3)>/=37wks

2. Gravidity. (1) PG, (2) GII-GV, (3) above GV

3. Parity: Primiparous -(1), Para II-IV (2), Para-V and above (3)

4. Initially compliant (1) Pushing down pain, (2) leakage of liquor, (3) Bleeding from the Vagina

(4)-Elevated Blood pressure (5) other, Mention---

6. Is there an interval of more than twelve hours to arrive? (1) -No, (2) -Yes

7. If the answer is yes, where? (1) - Delay in choosing to seek medical attention, (2)- wait time for transportation to a hospital, (3) dalliance of receiving proper and sufficient care.

8. Does She have History of ANC follows up (1) Yes, (2) No

If yes, how many times she visits (1) <8, (2) >/= 8

9. Does She have any type of HTN on this pregnancy? (1) Yes, (2). No

10. Does She has Previous C-delivery history? (1). Yes, (2). No

11. Does She has Previous Abruption history? (1). Yes, (2). No

12. Does She has Previous Placenta previa history? (1). Yes, (2). No

13. Does She has trauma to the abdomen? (1) Yes, (2) no

Part 3. General Physical examination

1. Mother's V.S: (1) normal, (2) abnormal (BP < 90/60, PR > 100 B/M).

2. **Fetal Assessment**

2.1. Presentation of Fetus: Cephalic- (1), Breech -(2), (3) -others mention---------

2.2. FHB---------- (1) Normal, (2) Abnormal, (3) Negative

Part 4. Laboratory Results

1. Hemoglobin up on arrival------(1): <7gm/dl, (2): 7-10, (3) 10- 11, (4) > 11

2.Did Renal function test is done? (1) yes, (2) No.

3. If yes what is the result of creatinine: (1) </= 1.1, (2) > 1.1

4. Did coagulation profile test is done? (1) yes, (2) No.

5. If yes, is it normal? (1) yes, (2) No.

Part 5. Ultrasound result

1. Was ultrasound performed? (1) Yes, (2) no

2. If the answer is yes, select the finding? (1) Placenta Previa, (2) Placental abruption, (3) other mention----------

3. If PP, Category? (1) True Placenta previa, (2) low lying

4. If placental abruption, which Grade? (1) Grade 1, (2) Grade 2, (3) Grade 3

Part 6. Management course

1. Was she admitted to maternity ward: (1) yes, (2) no
2. If yes, for how many weeks she was admitted: (1) <1 week, (2) 1-2weeks, (3) 3-4 weeks, (4) >4 weeks

3. If she was admitted, what steps were taken? (1) - Steroids, (2) tocolytic, (3) other mention…….

4. What is the mode of delivery (1) Vaginal, (2) C.S

5, If vaginal: 1: SVD, 2:induced, 3: operative V.D

Part 7. outcome of Neonate

1. Neonates delivered? (1) singleton, (2) twins

2. Gender: (1) -male, (2) -female

3. Perinatal Result (1) alive, (2) Not alive (SB or END)

3.1 APGAR score if alive -------1: less than 7, 2: greater than or equals to 7

3.2 Delivery weight in grams------- 1:1000-1500gm, 2:1500-2500gm, 3: >2500gm

4. Was the newborn admitted to Intensive care unit? : 1: yes, 2: no

5. If yes, mention reason for admission? (1) Respiratory distress, (2) premature delivery, (3) a low weight at birth, (4) asphyxia at birth, (5) Neonatal sepsis

6. At discharge, what was the neonate's status? (1) got better, (2) passed away

7. if passed away, mention reason: (1)- newborn sepsis, (2) -RDS, (3)- other mention…

1.1 **For twins**

1.1.1 Twin- B sex; (1)-male, (2)- female

1.1.2 Result: (1) -Alive, (2)- Died

1.1.2.1 1st minute APGAR score -------1: less than 7, 2: greater than or equals to 7

1.1.2.2 5th minute APGAR score if alive-------1: less than 7, 2: greater than or equals to 7

1.1.3 Delivery weight in grams------- 1:1000-1500gm, 2:1500-2500gm, 3: >2500gm

1.1.4 Was the newborn admitted to Intensive care unit? : 1: yes, 2: no

1.1.5 If yes, mention reason for admission? (1) asphyxia at birth, (2) a low weight at birth, (3) premature delivery, (4) further specifics…

1.1.6 At discharge, what was the neonate's status? (1) got better, (2) passed away

1.1.7 if passed away, mention reason: (1)- newborn sepsis, (2) -RDS, (3)- other mention…

Part 8. Result of Mother

01, Is there is any adverse Maternal outcome (1) YES (2), NO

1.1 If yes for the above question, what was the adverse out come? (1) Death (2) PPH (3) Anemia (4) DIC (5) Hemorrhagic shock (6) other, specify……

1.1.1 If deceased, what resulted the death? - (1): Hemorrhagic shock, (2) End stage Renal insult, (3): DIC, (4): Cardiorespiratory Arrest, (5): other mention…….

2. Was the women candidate for Blood transfusion? (1) Yes, (2) no

3. If yes, did she get? (1) Yes, (2) no

4, Was she admitted to ICU? (1) : Yes, (2) :No

5. Duration in days after delivery: (1): less than 2, (2): two-seven, (3): greater than seven days

6. Status of the women during discharge? (1) Cured, (2) deceased