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Research Article

Maternal and Perinatal Outcome among Mothers Managed for Antepartum Hemorrhage in Attat Hospital, Southern Ethiopia: A Cross Sectional Study

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Abstract

Background: Antepartum hemorrhages a grave obstetrical emergency and is one of the leading causes of maternal and perinatal morbidity and mortality globally. Timely access to quality obstetric services is the major intervention recommended to avert both maternal and newborn unfavorable outcomes after antepartum hemorrhage. In Ethiopia particularly in Attat hospital, the magnitude and consequences of antepartum hemorrhage were not well studied. So, the aim of this study was to determine maternal and perinatal outcome among mothers managed for antepartum hemorrhage in Attat hospital.

Methods: A hospital-based cross-sectional study was conducted on 106 mothers with antepartum hemorrhage in Attat hospital from February 1 to July 30, 2017. All eligible mothers and their newborns were included till the sample size was achieved. Data were collected by using pre-tested structured interviewer administered questionnaire and reviewing medical records of mothers and their newborns. The data were entered and analyzed using SPSS version20.Binary logistic regression analysis was used to test associations between the independent and dependent variable. Variables with P-value < 0.25 during bivariate analysis were included to multivariable logistic regression model. Finally, variables with P-value ≤ 0.05 were expressed as factors associated with maternal and perinatal outcome of antepartum hemorrhage.

Results: In this study the proportion of women with antepartum hemorrhage was 5.9%. Most of with antepartum hemorrhage (86%) had anemia at admission and the rate of unfavorable maternal outcome was 56.6%. Lack of antenatal care increases three-time (AOR,3, CI,1.1-7.9) likelihood of unfavorable maternal outcome when compared with those who had at least once.

Bleeding more than 12 hours, low birth weight and non-reassuring fetal heart beat condition in labor were the major contributors for unfavorable perinatal outcome.

Conclusion and Recommendation: Having at least one complication in women with antepartum hemorrhage and their new born were very common. Therefore, community mobilization and education about the importance antenatal care and danger symptoms of pregnancy would reduce complication that occur in women with antepartum hemorrhage and their new born.

Keywords: *Antepartum Hemorrhage; Maternal and Perinatal Outcome; Attat Hospital; Ethiopia*

Abbreviations

APH: Ante Partum Hemorrhage; CD: Cesarean Delivery; NRFHR: Non-Reassurance Fetal Heart Rate; PPH: Postpartum Hemorrhage; EDHS: Ethiopian Demographic and Health Survey; WHO: World Health Organization; SDGs: Sustainable Development Goals

Background

Antepartum Hemorrhage (APH) is defined as genital tract bleeding from 28th week of gestation till delivery of the last fetus. Antepartum hemorrhages a grave obstetrical emergency and is one of the leading causes of maternal and perinatal morbidity and mortality globally [1-3].

Maternal outcomes of antepartum hemorrhage were malpresentation, premature labor, postpartum hemorrhage, shock, retained placenta. It also includes higher rates of caesarian sections, per partum hysterectomies, coagulation failure and even death. A study conducted in India revealed that, required blood transfusion was additional outcomes of APH [4,5]. On the other hand, perinatal unfavorable outcomes were prematurity, low birth weight, intrauterine death, early neonatal death, congenital malformations, neonatal intensive care unit admission (NICU), and birth asphyxia [6,7].

There are different factors associated with maternal and perinatal outcome of ante partum hemorrhage deliveries in different literatures. Local study done in Ethiopia indicated that poor access to comprehensive obstetric care is significantly associated with maternal unfavorable outcome [7]. Length delay before arrival, preterm labor, maternal anemia, male fetal sex and vaginal delivery were among factors significantly associated with predictors of perinatal unfavorable outcome in a study conducted in Ethiopia [8]. This study will be aimed to assess the magnitude and factors associated with maternal and perinatal outcomes of antepartum hemorrhage deliveries in Attat hospital, southern Ethiopia. Findings arising from this study may be used to gauge the severity of this problem so that a management and preventive protocol can be established to avert possible fatal maternal and perinatal outcome.

Methods

Study design and period

Hospital based cross sectional study was conducted from February 1 to July 30, 2017.

Study area and population

The study was conducted in Attat hospital which is found in Gurage zone in southern Ethiopia. It was located 168 km to the south west of Addis Ababa. It gives service for more than 800,000 population.

All pregnant women whose gestational age were ≥ 28th complete weeks with diagnosis of ante partum hemorrhage and delivered, their new born in Attat hospital during the study period.

Sample size and sampling techniques

All delivered mothers and their new born at labor/maternity ward admitted and managed with the diagnosis antepartum hemorrhage during the study period were included.

Study variables

- **Outcome variable**: Maternal and perinatal outcome of antepartum hemorrhage.
- **Independent variables**
- **Socio-demographic characteristics**: Age of the mother, residence, level of education, occupation and marital status.
- **Health System related factors**: Referral system, distance traveled, transport facilities, blood transfusion facilities, diagnostic facilities, NICU service and hospital stay.
- **Clinical factors**: Gestational age, parity, hypertension, history of previous abruption and placenta previa, previous C-D, complaint, maternal vital sign at presentation, HGB at admission, types of APH, fetal presentation, fetal heart beat at presentation, ANC follow up, mode of delivery.

Operational definition and definition of terms

- **Unfavorable maternal outcome**: A mother dead or sustained complication like hemorrhagic shock, postpartum hemorrhage, severe anemia, DIC, couvelaire uterus, placental accrete, renal failure, uterine rupture, cesarean delivery, peri-partum hysterectomy and wound dehiscence after diagnosed and managed for APH.
- **Favorable maternal outcome**: Women did not develop any other complication antepartum, during labor and postpartum except antepartum hemorrhage.
- **Unfavorable perinatal outcome**: The presence of one the following complication like perinatal death, low birth weight, birth asphyxia, low Apgar score, premature baby and need for neonatal admission in first week were considered as an favorable outcomes.
- **Favorable perinatal outcome**: Alive neonate delivered from women with antepartum hemorrhage without clinical complication.

Data collection tools and procedures

Six trained midwifes working in maternity unit who got two days training regarding the research objective and process collected the data. Women who gave birth were interviewed based on an interviewer administered pre-tested structured questionnaire and chart review.

Data processing and analysis

The collected data were checked for completeness, coded and entered into EpiInfo version 7 and then exported to statistical package for social sciences (SPSS) version 20 for analysis. Binary logistic regression analysis was done to test association between the independents and dependent variable and multivariable logistic regression analysis was done to control the effect of confounding factors using p-value ≤ 0.05.

Ethical clearance was obtained from Institutional Review of Jimma University Institute of health and formal permission was obtained from the Attat hospital administrative so as to conduct the study in the hospital. Verbal consent was asked before administration of questionnaire and chart review.

Results

Socio-demographic characteristics of respondents

In the study period, a total of 1,786 women gave birth in Attat hospital. One hundred six of them were diagnosed having APH showing prevalence of 5.9%. Majority of the women were rural residence (78.3%) and Gurage (67%) in ethnicity. The highest proportion of women (43.4%) were in the age group of 21-34years with mean age of 28.76 years with standard deviation of 6.81 years (Table 1).

Variables	Frequency	Percentage
Age in yr.'s		
20 or younger	28	26.4
21-34	46	43.4
35 and above	32	30.2
Residence		
Rural	83	78.3
Urban	23	21.7
Marital status		
Married	104	98.1
unmarried	2	1.9

Educational status		
No formal education	49	46.2
Primary	34	32.1
Secondary	8	7.5
> Secondary	15	14.2
Religion		
Muslim	46	43.4
Christian	60	56.6
Ethnicity		
Gurage	71	67
Amhara	20	18.9
Others	15	14.1
Occupation		
House wife	78	73.6
employed	18	17
Student	1	0.9
Merchant	9	8.5

Table 1: *Socio-demographic characteristics of respondents with APH and those who gave birth in Attat Hospital, 2017 (N = 106).*

Clinical conditions of women with antepartum hemorrhage

Three-fourth of women were 79 (74.3%) multipara and 55.7% of the mothers had deranged vital sign at presentation. Majority of (86%) women had hemoglobin < 11 gm/dl at admission (Table 2).

Clinical conditions	**Frequency**	**Percent**
Gestational age in weeks		
< 37wks	71	67
≥ 37	41	33
Parity		
Primipara	27	25.5
Multipara	79	74.5
Complaint of client at presentation		
Vaginal bleeding	71	75.5
Abdominal pain	25	20.9
Decrease movements	10	3.8
Duration of compliant		
< 12 hours	47	44.3
≥ 12 hours	59	55.7
ANC follows up		
Yes	77	72.6
No	29	27.4

HTN		
Yes	24	22.6
No	82	77.4
History of C-delivery		
Yes	20	44.34
No	86	55.66
Maternal vital sign at presentation		
Normal	47	44.34
Deranged	59	55.66
Fetal presentation		
Cephalic	54	55.7
Breech	47	38.7
Others (brow, transverse lie)	5	5.6
Foetal heart beat at presentation		
Absent	6	5.7
Non-reassure fetal status	42	39.6
Normal	58	54.7
Types of APH		
Placenta previa	44	41.5
Abruptio placenta	33	31.13
Uterine rupture	8	7.5
local cause/leech infestation	3	2.83
Others (heavy show and unknown)	18	16.9
Maternal haemoglobin at admission		
< 7 gm/dl	40	37.7
7 - 10.9 gm/dl	51	38.1
≥11 gm/dl	15	14.2
Mode of delivery		
Vaginal	22	20.8
Caesarian	76	71.7
Laparotomy	8	7.5

Table 2: *Clinical conditions of mothers with APH and those who gave birth at Attat Hospital, 2017 (N = 106).*

Two-third of women gave birth before complete 37 weeks of pregnancy and 41% of were had placenta previa and 31% were abruption placenta. More than 50% of women with antepartum hemorrhage presented at emergency after more than half day of clinical presentation.

Health system related factors of mothers with APH.

More than half of the women with antepartum hemorrhage traveled greater than fifty kilometer and the common reason for delay to reach the hospital. Three-fourth of women with antepartum hemorrhage were arrived in labor ward without referral papers and only 60% of women arrived in Hospital by ambulance (Table 3).

Health system related factors	Frequency	Percent
Is there any delay		
Yes	42	39.6
No	64	60.4
Distance travelled in km		
< 50	50	47.2
≥ 50	56	52.8
Women referred		
Yes	27	25.5
No	79	74.5
Place of delay		
Delay at home	25	23.6
Delay on the way	10	9.4
Delay in health facility	7	6.6
Mode of transport		
Ambulance	63	59.4
Public transport	42	39.6
Other option	3	2.83

Table 3: *Health system related factors of mothers with APH and those who gave birth at Attat Hospital, 2017 (N = 106).*

Maternal outcome

The incidence of maternal unfavorable outcome was 60 (56.6%). More than half (52.83%) of mother's were alive with certain complications and (3.8%) of them died. About (43%) of the mothers alive without complication (Table 4).

Maternal Outcome		Frequency	Percentage
Outcome	Alive without complication	46	43.4
	Died	4	3.8
Complications	PPH	25	24.5
	Anemia	16	15.7
	Hemorrhagic shock	10	9.8
	Per-partum hysterectomy	3	2.94
	DIC	2	1.96
Length of hospital stay	< 3 days	24	22.64
	≥ 3 days	82	77.36
Blood transfusion indicated	Yes	38	35.8
	No	68	64.2
Transfused at least o1unit of Blood	Yes	16	42.1
	No	22	57.9

Table 4: *Distribution of maternal outcome among women with antepartum hemorrhage who gave birth in Attat Hospital, 2017.*

Perinatal outcome

The incidence of perinatal unfavorable outcome was 83 (74.1%). Majority (62.5%) of newborns were live birth with certain complications and (6.25%) still birth and (5.35%) of them were early neonatal death. About 26% live birth without complication (Table 5).

Perinatal Outcome			Frequency	Percentage
Outcome	Live birth without complication		29	25.9
	Died	Still birth	7	6.25
		Early neonatal death	6	5.35
Complications	Low birth weight		36	32.14
	prematurity		5	4.5
	Birth asphyxia		17	15.2
	Low Apgar score		11	9.8
	Neonatal sepsis-jaundice		1	0.9
NICU admission	Yes		61	54.5
	No		51	45.5
Indication of NICU admission	Low birth weight		17	15.2
	Birth asphyxia		36	32.1
	Preterm birth		3	2.68
	Others		5	4.5
Number of fetus	Single		100	89.3
	Twin		12	10.7
Sex of newborn	Male		59	52.68
	Female		53	47.32
Apgar score	< 7 at first minute		33	31.4
	≥ 7 at first minute		72	68.6
Apgar score	< 7 at fifth minute		11	6
	≥ 7 at fifth minute		94	94

Table 5: *Distribution of perinatal outcome among newborns those delivered from women with diagnosed antepartum hemorrhage in Attat Hospital, 2017.*

Factors associated with unfavorable maternal outcome among mothers managed for antepartum hemorrhage

Association of each independent variables were assessed by bivariate and multivariate logistic regression. Maternal sociodemographic status, age, parity, vital sign status at admission, residence and anemia status were not affect the unfavorable maternal outcomes. But lack of antenatal care increases three times (CI:1.09,7.90) more likely unfavorable maternal outcome when compare to those women who had at least one antenatal visit (Table 6).

Variables	Maternal outcome		COR (95%CI)	AOR (95%CI)
	Favorable outcome	Unfavorable outcome		
ANC follow up				
Yes	39 (84.8)	38 (63.33)	1.0	1.0
No	7 (13.2)	22 (36.67)	3.23 (1.2,8.4)*	3 (1.09,7.9)**
Parity				
Primipara	14 (51.9%)	32 (40.5%)	1.0	
Multipara	13 (48.1%)	47 (59.5%)	1.6 (0.66,3.8)	
Maternal Vital sign at presentation				
Normal	25 (53.2%)	21 (35.6%)	1.0	
Deranged	22 (46.8%)	38 (64.4%)	2.06 (0.94,4.5)	
Age in years				
20 or younger	15 (32.6%)	13 (21.67%)	1.0	
21-34	19 (41.3%)	27 (45.0%)	1.64 (0.64,4.23)	
35 and above	12 (26.09%)	20 (33.3%)	1.9 (0.69,5.4)	
Residence				
Urban	9 (19.6%)	14 (23.33%)	1.0	
Rural	37 (80.4%)	46 (76.67%)	0.8 (0.3,2.05)	
Hgb at admission in gm/dl				
< 7	14 (30.4%)	26 (43.33%)	2.8 (0.822,9.44)	
7 - 9.9	13 (28.3%)	22 (36.67%)	2.54 (0.74,8.77)	
10 - 10.9	10 (21.74%)	6 (10%)	0.9 (0.212,3.82)	
≥ 11	9 (19.6%)	6 (10%)	1.0	
Is there any Delay				
Yes	13 (28.3%)	29 (48.33%)	2.34 (1.05,5.38)*	1.2 (0.22,5.92)
No	33 (71.7%)	31 (51.67%)	1.0	1.0
Place of delay				
Delay at home	6 (12.24%)	19 (31.67%)	3.37 (1.19,9.54)*	2.6 (0.42,15.76)
Delay on the way	4 (8.2%)	6 (10%)	1.59 (0.41,6.2)	1.4 (0.19,10.94)
Delay in other facility	3 (6.1%)	4 (6.67%)	1.42 (0.3,6.9)	1.5 (0.34,11.87)
No delayance	33 (67.35%)	31 (51.67%)	1.0	1.0
Distance traveled in km				
< 50	21 (45.6%)	29 (48.33%)	1.0	
≥ 50	25 (54.4%)	31 (51.67%)	0.9 (0.42,1.94)	
Mothers referred				
Yes	13 (28.3%)	14 (23.3%)	1.0	
No	33 (71.7%)	46 (76.7%)	1.3 (0.54,3.1)	

Table 6: *Factors associated with maternal outcome of APH on bivariable and multivariate logistic regression analysis among mothers who gave birth in Attat hospital, 2017.*

**Variables which had p-value < 0.25 by bivariate analysis.*

***Variables which had p-value < 0.05 by multivariate analysis*

Factors associated with unfavorable perinatal outcome among new born delivered from APH mothers

The socio-demographic health system related factors, antenatal care status, types of antepartum hemorrhage and distance from the Hospital were tested for their association with perinatal unfavorable outcomes and there were no associated factors. But the fetal condition before intervention, bleeding per vaginum more than 12 hours and gestational before term are associated with unfavorable perinatal outcomes. Non-reassuring fetal heart status five times (CI,1.2 - 20.5), vaginal bleeding more than 12 hours four times (CI,1.0 - 12.8) and prematurity 25 times (CI,7.0 - 87.7) status increase unfavorable perinatal outcome.

In this study, the determinant factors for the unfavorable perinatal outcomes are prematurity, symptoms more than 12 hours and fetal heart rate abnormality on admission.

Variables	Perinatal outcome		COR (95%CI)	AOR (95%CI)
	Favorable outcome	Unfavorable outcome		
FHB at presentation				
Absent	0	6 (7.2%)	12 (0.00,26)	9.3 (0.0,12.5)
Non-reassure	4 (13.8%)	38 (45.8%)	7.2 (2.27,22.82) *	5 (1.23, 20.5) **
Normal	25 (86.2%)	39 (47%)	1.0	1.0
Gestational age in weeks				
< 37	5 (17.2%)	66 (92.9%)	28.8 (9.07,91.5) *	25 (7,87.7) **
≥ 37	24 (82.8%)	17 (7.1%)	1.0	1.0
Antenatal care follows up				
Yes	23 (79.3%)	57 (68.7%)	1.0	
No	6 (20.7%)	26 (31.3%)	0.612 (0.22,1.7)	
Duration of compliant				
< 12hrs	19 (65.5%)	31 (37.34%)	1.0	1.0
≥ 12hrs	10 (35.5%)	52 (62.66%)	3.3 (1.36,8.14)	4 (1.02,12.84) **
Types of APH				
Placenta previa	13 (44.8%)	34 (41%)	0.908 (0.32,2.6)	
Abruptio placenta	8 (27.6%)	28 (33.7%)	1.2 (0.381,3.72)	
Others	8 (27.6%)	21 (25.3%)	1.0	
Mothers referred				
Yes	8 (27.6%)	22 (26.5%)	1.0	
No	21 (74.4%)	61 (75.5%)	0.86 (0.33,2.26)	
Distance traveled in km				
< 50	12 (41.4%)	41 (49.4%)	1.0	
≥ 50	17 (58.6%)	42 (50.6%)	1.4 (0.6,3.3)	

Table 7: *Factors associated with unfavorable perinatal outcome of APH on bivariable and multivariable logistic regression analysis among new born in Attat hospital, 2017.*

**Variables which had p-value < 0.25 by bivariate analysis.*

***Variables which had p-value < 0.05 by multivariate analysis.*

Discussion

In this study, the incidences of unfavorable maternal and perinatal outcome among antepartum hemorrhage deliveries were 60 (56.6%) and 83 (74.1%) respectively. Lack of antenatal visit was the determinant factor unfavorable maternal outcomes whereas prematurity, late arrival in healthy facility and abnormality fetus heart beat were determinant factor for perinatal complications.

More than half of women with APH developed at least one of the following complications: post-partum hemorrhage, anaemia, coagulation failure, sepsis and death. This finding was comparatively higher when compared to world health statistics 2016 (27%) [1] and a study conducted in Tanzania (28.2%), Nigeria (53.3%) and three studies in India (4%, 53.4% and 2.2%) [9,13,15-17]. But lower than a study conducted in Thailand (86.7%), India (66.7%) and Ethiopia (89.74%) [6,7,14]. Possible explanation regarding higher figure in this study might be the small sample size, geographical location and quality of care given in our set up.

Postpartum hemorrhage is one of the common complications among mothers with antepartum hemorrhage. In this study 24.5% of the mothers developed postpartum hemorrhage. This finding is higher than a study conducted in India (16%) and Tanzania (5.9%) [4,9]. But less than a study conducted in Ethiopia (37.4%) [7]. This might be poor prevention of postpartum hemorrhage in the study area.

Anemia is another complication in mothers with APH. Sixty percent of the mothers develop anemia. This result is higher than in a study conducted in India (11%) [15]. However, lower than in a study conducted in Nigeria (77.7%) and Ethiopia (37.4%) [7,13].

Peri-partum hysterectomy is other complication in mothers with APH. In this study 2.94% mother's peri-partum hysterectomy done for uncontrolled PPH. The result is nearly similar with a study conducted in India and Ethiopia, which were 3%, 3.1% respectively [5,7]. But less than a study conducted in Thailand (10%) [14].

Shock is also another complication in mothers with APH. This study shown 9.8% of mothers develop shock. This finding is higher than a study conducted in India (4%) [4]. Most of women with antepartum hemorrhage present more than 12 hours and travel more than 50kilometre for treatment, that why many developed shocks.

Poor quality of antenatal care or absent of antenatal resulted in unfavorable maternal outcome which comparable with other studies [4,10,11,13].

In this paper showed that three-fourth of neonates born from women with antepartum hemorrhage were developed at least one of the complications like mothers: birth asphyxia, low first Agar score, prematurity, early onset neonatal sepsis and jaundice and death. This finding was lower than a study conducted elsewhere [6-10,13]. This difference might be related to quality of services and resources in the managing health facility.

Low birth weight took the lion share complications observed among neonates born from APH mothers. In this study 36 (32.14%) of the new born develop low birth weight. This finding is lower than in a study conducted in India (68.4%), Tanzania (48.1%) and Ethiopia (35%) [6-7,9]. But more than a study conducted in Ethiopia (10.4%) [8].

Low Apgar score is other complication in new born delivered among APH mothers. Eleven (9.8%) new born had low Apgar score (< 7) at fifth minutes. The result is less than a study conducted in India (79%) and Nigeria (44.4%) [13,15].

Indeed, birth asphyxia is another complication in neonates delivered from mothers with APH. Seventy (9.8%) of new born develop birth asphyxia in this study. This result is less than a study conducted in Nigeria (38.9%) [11].

In this study, prematurity was a strong predictor of unfavorable perinatal outcome indicating that new born who had delivered before 37 completed weeks were 25 times more unfavorable outcome than those new born who delivered after 37 weeks. This finding is in line with the studies done in different parts of the world [4,5,7,10]. Prematurity also responsible for other perinatal complication mentioned in this study.

Non-reassuring fetal status at presentation was another factor associated with perinatal outcome revealed that fetus who had non-reassuring fetal status at presentation were 5 times more unfavorable outcome compared to those who had normal fetal heart beat before intervention. This finding is consistent with a study conducted in India, Thailand and Nigeria [5,12,14].

Visit health facility beyond 12 hours onset of complaint was another factor associated with unfavorable perinatal outcome which showed new born those delivered from APH mother visit health facility beyond 12 hours onset of complaint were four times more unfavorable outcome than those women arrive within 12 hours of symptoms. This finding was compatible with the study conducted in India, Nigeria and Ethiopia [5,8,11-23].

In this study, recognized limitation are small sample size, being institutional study and we were not able follow maternal outcome after discharge from Hospital.

Conclusion and Recommendation

Antepartum hemorrhage is the major cause of both maternal and perineal morbidity and mortality in Ethiopian and other resource limited countries. it facilitates other complication as consequence like postpartum hemorrhage, shock, anemia. Provision of community about the importance antenatal care, providing quality antenatal care in health facility and service might prevent most of the morbidity and mortality related antepartum hemorrhage.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

SA designed the study, involved in data analysis and interpretation, wrote the paper and prepared initial draft of the manuscript for publication.

YA had oversight of all the stages of the research, critically reviewed final draft of the paper and the prepared manuscript for publication. Both authors read and approved the final manuscript.

MG had re writing and reviewing the manuscript the finally summit to journals

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