MATERNAL AND PERINATAL OUTCOME OF ANTEPARTUM HEMORRHAGE AT THREE TEACHING HOSPITALS IN ADDIS ABABA, ETHIOPIA

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ABSTRACT

BACKGROUND: Antepartum hemorrhage (APH) is an obstetric emergency contributing to a significant amount of perinatal & maternal morbidity and mortality.

OBJECTIVE: The objective was to assess the maternal and perinatal outcome of pregnancies complicated by APH in Ethiopian setup.

METHODOLOGY: This was a facility based cross sectional descriptive at three teaching hospitals, Addis Ababa, Ethiopia. Pregnant women who were diagnosed to have antepartum hemorrhage and delivered in the three hospitals from January to June, 2018 were included. Data was collected using a structured pre-tested questionnaire by interviewing participants and reviewing medical records. Data was analyzed using SPSS 23 statistical software.

RESULT: There were a total of 9,643 deliveries during the study period. The prevalence of APH was 3.7% of all the deliveries. Abruptio placenta was the most frequent cause (n= 221, 2.3%). Cesarean section was the most common route of delivery (n=224, 62.5 %). The perinatal mortality rate was 158/1,000 births. Fifty four (15%) and 52 (14.5%) of the women developed postpartum hemorrhage and anemia, respectively. There was also one maternal death.

CONCLUSION: The perinatal mortality, cesarean section rates, postpartum hemorrhage & anemia in APH is high in the hospitals.

KEY WORDS: Perinatal mortality, cesarean section rates, postpartum hemorrhage, anemia in APH

(The Ethiopian Journal of Reproductive Health; 2020; 12;12-19)

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INTRODUCTION

Antepartum hemorrhage (APH) is defined as any bleeding from the genital tract during pregnancy, after the period of viability until the delivery of the fetus. Antepartum hemorrhage is generally defined as bleeding after 24 weeks of pregnancy until delivery [1,2]. APH is an obstetric emergency associated with high perinatal & maternal morbidity and mortality. It occurs in 2-5% of pregnancies and is an important cause of fetal and maternal death. Thirty percent of maternal deaths are caused by APH of which 50% are associated with avoidable factors [3].

The causes of APH can be divided into three main groups, placenta previa, placental abruption and others. Maternal complications of APH include postpartum hemorrhage (PPH), shock, retained placenta, preterm deliveries, fetal growth restriction, and higher rates of caesarian section, peripartum hysterectomy, coagulation failure, puerperal infections and even death. Fetal complications include premature delivery, low birth weight (LBW), intrauterine fetal death (IUFD), congenital malformations and birth asphyxia[3].

Ethiopia is one of the developing countries with high perinatal and maternal morbidity and mortality. According to EDHS 2016 the neonatal mortality rate was 32 per 1000 live birth and the maternal mortality ratio was 412 per 100,000 live births[4]. Understanding the associations between APH during pregnancy and perinatal and maternal complications is critical for development of strategies and programs to deliver maternal interventions of proven efficacy. In our country there are limited numbers of published researches on perinatal and maternal outcome of APH. This study was on the magnitude of the APH, maternal and perinatal outcome, and associated factors in Ethiopian.

METHODOLOGY

This was a facility based cross sectional descriptive study which was conducted from January 1, 2018 to June 2018 GC in three teaching hospitals, Addis Ababa, Ethiopia. The hospitals were Tikur Anbesa Hospital (TAH), Gandhi Memorial Hospital (GMH) and Zewditu Memorial Hospital (ZMH) and they are affiliated to the Department of Gynecology and Obstetrics, Addis Ababa University (AAU). All mothers with APH and delivered in the three study hospitals during the study period were included in the study.

The sample size was determined using Epi Info statistical software for cross sectional study using the perinatal death rate of 36.9% from a study Jimma University Specialized Hospital, Ethiopia[5] and was found to be 376 and we included all pregnancies complicated by hemorrhage after 28 weeks of gestational age according to the legal definition in our country[6].

Data was collected using a structured pre-tested questionnaire was used by three trained midwives through interviewing the participants, reviewing medical records of mothers and neonates, and using telephone call to interview for maternal and fetal complication on the second and seventh post-delivery days. The independent variables were socio-demographic variables (maternal age, educational status, marital status and family income per month) and obstetric variables (placenta previa, abruptio placenta, APH of unknown origin, uterine rupture, PIH, parity, multifetal pregnancy and previous uterine scar). The dependent variables were mode of delivery, maternal outcome (postpartum hemorrhage, peripartum hysterectomy, anemia, blood transfusion, acute kidney injury (AKI), disseminated intravascular coagulopathy (DIC), hypovolemic shock, ICU admission and maternal death) and perinatal outcome (5^{th} minute APGAR score, preterm birth, LBW, IUFD, neonatal ICU admissions and early neonatal death (ENND)).

The collected data was coded, cleaned and analyzed using SPSS version 23 statistical software. Descriptive statistics was used to present the result and tables were used to assist data presentation. Ethical clearance was obtained from the Institutional Review Board (IRB) of the Department of Obstetrics and Gynecology, School of Medicine, College of Health Sciences of AAU. Permission to conduct the study was also obtained from the heads of the three study hospitals. Participation in the study was completely voluntary and informed consent was acquired from every participant before participation.

RESULTS

There were a total of 9,643 deliveries from January 1 to June 30, 2018 in the three study Hospitals. Out of these deliveries 358 women were diagnosed to have APH giving a prevalence of APH of 3.7% (358/9643).

The majority of the study participant women were in the age range of 20-29 years, married and housewives with proportions of 69% (247/358), 97.3% (348/358) and 60.6% (217/358) respectively. About two third, 68.7% (246/358), had attended formal education. And, 60.6% (217/358) house wives **(Table 1)**.

Table 1: Socio-demographic characteristics of women with APH in teaching hospitals affiliated to AAU, January – June, 2018. (n=358)

Variables		Frequency	Percent
Age			
–	15 – 19 yrs	5	1.4
–	20 _ 24 yrs	88	24.6
–	25 _ 29 yrs	159	44.4
–	30 _ 34 yrs	84	23.5
–	>=35 yrs	22	6.1
Marital status			
–	Married	348	97.3
–	Single	7	1.9
–	Divorced	3	0.8
Educational status			
–	Cannot read and write	25	7
–	Read and write	87	24.3
–	Primary education	104	29.1
–	Secondary education	71	19.8
–	College and above	71	19.8
Occupation			
–	House wife	217	60.6
–	Government employee	84	23.5
–	Private employee	50	14
–	Others	7	1.9
Family income in ETB[a]			
–	0-600	11	3.1
–	601-1650	46	12.8
–	1,651-3,200	121	33.7
–	3,201-5,250	115	32.2
–	5,251-7,800	44	12.2
–	7,801-10,900	9	2.5
–	Over 10,900	12	3.5

(a) Classification according to the Ethiopian employment income tax rate of 2016.

Abruptio placenta was the most frequent diagnosis in 2.3% (221/9643) of women and accounted for 61.7% (221/358) of APH cases. APH of unknown origin was the second most common diagnosis reported in 0.8% (77/9643) of all deliveries and accounts for 21.5% (77/358) of the APH cases. Forty eight women were diagnosed with placenta previa representing 0.5% of all deliveries and 13.4% (48/358) of APH cases. There were 12 women with the diagnosis of uterine rupture which represent 3.4%.

PIH was seen in 16.2% (58/358) of all women with APH. Thirty nine women had previous uterine scar which was present in 10.9% of the cases. PROM was identified in 8.6% (19/358) of cases. **(Table 2)**

Table 2: Causes of APH versus maternal obstetric factors in women with APH at three teaching hospitals affiliated to AAU, January – June, 2018.

Causes of APH	Maternal obstetric factors			
	PIH	Multiple pregnancy	Cesarean scar	PROM
Placenta previa (n=48)	3 (6.25%)	1(2%)9	(18.75%)	0
Abruptio placenta(n=221)	49 (22.2%)	7 (3.2%)	13 (5.9%)	15 (6.8%)
Uterine rupture (n=12)	0	0	9 (75%)	0
APH of UK origin (n=77)	6 (7.8%)	1 (1.3%)	8 (10.4%)	4 (5.2%)
Total (n=358)	58 (16.2%)	9 (2.5%)	39 (10.9%)	19 (8.6%)

The most common clinical type of abruptio placenta was mild abruption accounting for 51.1% (113/221). Clinically severe and moderate types accounted for 25.8% (57/221) and 23.1% (51/221) of abruption cases respectively.

From the 48 women with placenta previa, placenta previa totalis was diagnosed in 34 (70.8%) women which is the most common type, followed by low lying

placenta previa, placenta previa partialis and placenta previa marginalis diagnosed in 7 (14.6%), 4 (8.4%) and 3 (6.2%) patients respectively.

Cesarean section was the most common route accounting for 62.6 % (224/358) of all deliveries with APH. The most common indication for cesarean section was non reassuring fetal heart rate pattern which accounted for 51.8% (185/358). In women with abruptio placenta 71% (156/221) were by cesarean section representing 69.6% (156/224) of the total cesareans done for APH. Forty five cesarean sections were done in women with placenta previa with a rate of 93.8% (45/48) and contribute 20.1% (45/224) of the cesareans deliveries for APH. The cesarean section rate for APH of unknown cause was 16.9% (13/77) and accounts for 5.8% (13/224) of cesareans for APH. **(Table 3)**

Table 3: Causes of APH versus mode of delivery in women with APH at three teaching hospitals affiliated to AAU, January – June, 2018. (n=358)

Cause of APH	SVD	Instrumental Delivery	Cesarean delivery	Others[a]	TOTAL
Placenta previa	2 (4%)	0	45 (93.8%)	1 (2%)	48
Abruptio placenta	60 (27%)	4 (1.9%)	156 (70.6%)	2 (0.9%)	221
Unknown cause	58 (75.3%)	5 (6.5%)	13 (16.8%)	0	77
Uterine rupture	0	0	10 (83.3%)	2 (16.7%)	12
Total	120 (33.5%)	9 (2.5%)	224 (62.6%)	5 (1.4%)	358

(a) Others include breech delivery and laparotomies

There were 367 neonates born to the 358 mothers with APH of which 95.1% (349/367) were singleton. Out of the 367 neonates 12.3% (45/367) were still born while 3.5% (13/367) were Early Neonatal Deaths (ENND). Abruptio placenta and uterine rupture accounted for 77.8% (35/45) and 13.3% (6/45) of the IUFDs respectively. Fifty eight (16.6%) of the neonates were admitted to NICU and the major reason for referral was preterm and low birth weight. From the 349 live births, 13 (3.7%) neonates died in the first week of their life and abruptio placenta was responsible for 11 (84.8%) of ENNDs.

The perinatal mortality (PNM) rate among the participants with APH was 158‰ (158 per 1000) births. The PNM was 208 per 1000 birth for AP, 583 per 1000 birth for uterine rupture, 62.5 per 1000 birth for placenta previa and 26 per 1000 birth for APH of unknown origin. The birth weight was below 2500gm in 25.3% (93/367) of the neonates and 77.4% (72/93) of these neonates were born to women with abruptio placenta. There were 9 LBW neonates in women with placenta previa which was present in 18.8% (9/48) of the cases. Preterm delivery accounts for 18.8% (69/367) of all deliveries. From these 55 (24.9%) were in women with abruptio placenta. Seven were in women with placenta previa representing 14.5% (7/48) in this group. In this study 19.3% (71/367) neonates had low APGAR score at the 5th minute. More than 24.4% (54/221) of neonates born to mothers with AP had 5th minute APGAR of <7. In 10.4% (5/48) of women with placenta previa the 5th minute APGAR score is <7. More than 66.7% of neonates born to mothers with uterine rapture and dehiscence had 5th minute APGAR score of <7. **(Table 3)**

Table 3: Causes of APH versus perinatal outcome in women with APH at three teaching hospitals affiliated to AAU, January – June, 2018.

Causes of APH	VLBW and LBW	5th MINUTE APGAR <7	NICU admission	ENND	IUFD	Preterm	Perinatal death
Placenta previa (n=48)	9 (18.8%)	5 (10.4%)	4 (8.3%)	1 (2%)	2 (4%)	7 (14.6%)	3 (6.25%)
Abruptio placenta(n=221)	72 (32.6%)	54 (24.4%)	38 (17.2%)	11 (5%)	35 (15.8%)	55 (24.9%)	46 (20.8%)
Unknown cause (n=77)	12 (16.7%)	4 (5.2%)	9 (11.7%)	0	2 (2.6%)	6 (7.8%)	2 (2.6%)
Uterine rapture (n=12)	0	8 (66.7%)	2 (16.6%)	1 (8.3%)	6 (50%)	1 (8.3%)	7 (58.3%)
TOTAL (n=358	93 (25.3%)	71 (19.3%)	53 (14.4%)	13 (4%)	45 (16.8%)	69 (18.8%)	58 (15.8%)

Fifty four (15%) of the mothers developed postpartum hemorrhage as diagnosed clinically or by the 10% drop in hematocrit criteria. Most women with uterine rupture, 91.7% (11/12) developed PPH. More than 43% (21/48) of mothers with placenta previa were diagnosed to have PPH while only 8.6% (19/221) of mothers with AP were diagnosed to have PPH. A total of 52 (14.5%) women were diagnosed with anemia in the postpartum period and 91.7% of women with uterine rupture were diagnosed with anemia while 40% women with Placenta previa were diagnosed with anemia postpartum. Fifteen women were transfused with blood and blood products of which eight were for women with uterine rupture. There were 3 women with a diagnosis of DIC, 2 women with AKI, 3 women with peripartum hysterectomies, 10 women with hypovolemic shock and 3 mothers were admitted to ICU. There was one maternal death from the three admitted cases to ICU with possible cause of death being multiple organ failure. **(Table 4)**

Table 4: Causes of APH versus maternal outcome in women with APH at three teaching hospitals affiliated to AAU, January – June, 2018.

Causes of APH	PPH	Anemia	Blood transfusion	AKI	DIC	Hysterectomy	Maternal collapse	admission ICU	Maternal death
Placenta previa (n=48)	21 (43.8%)	20(41.7%)	1 (2.1%)	0	0	0	0	0	0
Abruptio placenta (n=221)	19 (8.6%)	19 (8.6%)	4 (1.8%)	2(0.9%)	2(0.9%)	0	8 (3.6%)	2 (0.9%)	1 (0.45%)
Unknown cause (n=77)	3 (3.9%)	2 (2.6%)	2(2.6%)	0	0	0	1(1.3%)	0	0
Uterine rapture (n=12)	11 (91.7%)	11(91.7%)	8(66.7%)	0	0	3(0.84%)	1(8.3%)	1(8.3%)	0
Total	54 (15%)	52 (14.5%	15 (4.2%)	2 (0.6%)	2 (0.6%)	3 (0.84%)	10 (2.8%)	3 (0.84%)	1 (0.3%)

DISCUSSION

Antepartum hemorrhage accounts for 3.7% of all deliveries in this study which was similar to the study done by Majumder S. et al in India (7), where an incidence of 3.8% was reported. But the incidence was lower compared to the study done by Nega Chufamo et al (5) at JUSH and studies done in other parts of India (8), where an incidence of as high as 7.2 was observed. This could be due to the fact that the JUSH was the only referral hospital in the south west region where high risk mothers are managed. Abruptio placenta was the major cause of APH in the present study diagnosed in 2.24 % of all deliveries during the study period, the second common cause being APH of UK origin with 0.79% and followed by placenta previa which accounts for 0.49%. This finding was in contrast to the study done in JUSH where placenta previa was the second most common cause with an incidence of 1.4% (5). Other studies had

also reported placenta previa as the leading cause of APH[3, 7, 9 and 10]. The age distribution in this study revealed 69% of women were in the age group 20-29 years which is similar to the study done in JUSH where 65% were in the same age group[5]. This is in contrast to the traditional association of Abruptio placenta and Placenta previa with advanced maternal age.

Higher rate of cesarean delivery among APH cases, 62.6% (224/358), was found in this study which is comparable to studies done in JUSH and some developing countries [5, 7, 8]. Even higher rate of cesarean section as high as 90 % has been reported in other studies[3, 11]. The most common indication for cesarean section was non-reassuring fetal heart rate pattern which accounts for 51.8% which was similar to findings from JUSH report[5].

In general, increased perinatal morbidities and mortalities were observed in this study. The perinatal mortality rate was 158 per 1000 births which was lower than some of the local studies where perinatal mortality of 365 to 500 per 1000 was reported[5, 12]. The PNM for AP was 208 per 1000 births while higher perinatal mortality was reported in some of the developing regions (3,8). The main reason for the relatively low perinatal mortality rate could be due to that 97.5% of the clients in the present study were having ANC follow up and are living in the city where access to health facility within a short period of time was possible unlike those studies conducted in JUSH and Hawassa referral hospital, where more than 70 % of the clients were from rural areas[5, 12]. The other reason could be according to EDHS 2016 at the national level there is a decrease in perinatal and neonatal mortality due to different factors and those local researches were done 5 years back which might not reflect the current status.

There were 69 (19.3%) preterm deliveries and from this 55(79.7%) neonates were in women with abruptio placenta and similar findings were reported in studies done in India where 21.3% were delivered prematurely. The finding was lower compared to the study done at JUSH[5], where 50% were delivered prematurely. Ninety three (25.3%) were below 2500gm and from this 72 (77.4%) neonates were born to women with Abruptio placenta similar findings were reported in a study done in India. IUFD, Prematurity and low birth weight were the major fetal and neonatal problem in this study.

Fifty four (15%) of the mothers with APH had developed postpartum hemorrhage in this study which is lower compared to studies done at JUSH and other developing regions where as much as 60 % were diagnosed with PPH which could be because most our cases were having mild to moderate abruption and lesser proportion of placenta previa totalis[3, 5-14]. Compared to the current study higher maternal morbidities and mortalities were reported in studies done in JUSH and other developing regions[3,5,8,10,12 and 13]. This relatively lower maternal morbidity and mortality compared to other local studies [5, 12] could be due to timely intervention, availability of blood and blood products and relatively lesser proportion of patient with major degree placenta previa and more cases of mild and moderate Abruption.

CONCLUSION

The prevalence of antepartum hemorrhage in the present study was 3.7%. Abruptio placenta was the major cause accounting for 61.7% of APH cases. APH in the present study is associated with high maternal and perinatal morbidity and mortality with increased rates of anemia, postpartum hemorrhage, blood and blood products transfusion, caesarean section rates, preterm deliveries, low birth weight, NICU admission, IUFD and early neonatal death. The perinatal and maternal morbidity and mortality in this study, however, were lower compared to most of the studies done in developing countries.

RECOMMENDATION

Further research with larger sample size and different setup should be done to explore the association between perinatal and maternal morbidity and mortality with antepartum hemorrhage.

LIMITATIONS

A major limitation of this study was inability to follow discharged mothers after day seven postpartum. As a result, maternal morbidly and mortality might have been underestimated if additional complications occurred

at home. In addition; due to the nature of the study association between the causes of APH and maternal and perinatal morbidity and mortality were not assessed.

COMPETING INTEREST

The authors declare that there is no competing interest regarding the publication of this paper.

ACKNOWLEDGEMENT

We would like to thank Addis Ababa University for funding the study, the data collectors for their contribution for successful completion of the study and the clients for their willingness to be part of the study.

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