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Magnitude of Postpartum Hemorrhage among Women Delivered at Dessie Referral Hospital, South Woll, Amhara Region, Ethiopia

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Abstract

Background: Postpartum hemorrhage refers loss of more than 500 and/or 1000 ml of blood within 24 hour following vaginal, caesarean delivery respectively. It is significant public health problem both in developed and developing countries, causing considerable maternal mortality and morbidity. It is highly fatal if diagnosis and treatment is not provided early. In Ethiopia, the government launches different strategies to prevent postpartum hemorrhage. But still more than half of the maternal mortalities occurred after delivery due to hemorrhage. Even though postpartum hemorrhage is one of the major direct causes of maternal death in Ethiopia, there are only few studies done in the country. Therefore, determining magnitude and associated factors that causes postpartum hemorrhage is important to make different interventions.

Objective: The aim of this study is to assess magnitude and factors associated with postpartum hemorrhage in Dessie referral hospital.

Methods and materials: Institutional based cross-sectional study was conducted in Dessie referral hospital from 5th January 2017 to 10th January 2017. A one year document review (8th July 2015-7th July, 2016) was conducted. Data was collected using structured data extraction format from patient cards, admission and discharge summary registrations, operation registration log books and delivery registration log books. Descriptive statistics were done to characterize the study population using different variables. Bivariate and multiple logistic regression models were fitted to control confounding factors. Odds ratios with 95% confidence intervals were computed to identify determinants of preeclampsia.

Result: In this study, the overall magnitude of postpartum hemorrhage was 5.8%. Delivering women who have not ANC follow-up were about eleven (AOR, 11.3, 95% CI, 4.2-30.2) times more risk of developing PPH than those who have ANC follow-up. Delivering women who had 24 hour and more duration of labor were eight (3.0, 23.0) (AOR, 8.3, 95% CI, 3.0-23.0) times more risk of PPH development as compared to these who had less than 24 hour duration of labor.

Conclusion and Recommendation: The overall magnitude of postpartum hemorrhage is low in this study when compared with previous studies. But still it needs the attention of the government to reduce maternal and child mortality and morbidity. Non utilization of ANC, cesarean section, prolonged duration of labor and multiparty are predictors of postpartum hemorrhage. Health care providers should give high attention to initiate ANC, women who give birth by cesarean section.

Keywords: Magnitude; Postpartum hemorrhage; Hepatic dysfunction; Delivery; Cesarean section

Abbreviations: ANC: Antenatal Care; AOR: Adjusted Odds Ratio; CI: Confidence Interval; COR: Crude Odds Ratio; DHS: Demographic and Health Survey; EDHS: Ethiopia Demographic and Health Survey; PNC: Postnatal Care; PPH: Postpartum Hemorrhage

Introduction

Postpartum hemorrhage (PPH) refers loss of more than 500 and/or 1000 ml of blood within 24 hour following vaginal, caesarean delivery respectively. It is also defined as blood loss sufficient to cause hypovolemia, a 10% drop in the hematocrit or requiring transfusion of blood products regardless of the route of delivery [1-4]. PPH is the leading cause of maternal mortality in developing countries (25-43%), but pulmonary embolism is the leading cause of the maternal mortality in case of developed countries. It is a frequent complication of deliveries and its incidence is 2-4%, after vaginal deliveries and 6% after caesarean sections (C/S) [3-7]. Uterine atony, retained products of conception, trauma in genital tract and coagulation abnormalities are important causes of PPH [4,5,8-11]. PPH has long and short term impacts like, chronic illness, disability, increased risk of death and/or poor growth and development of their children, hepatic dysfunction, adult respiratory distress syndrome and renal failure [2,4,12-14]. Reducing maternal mortality is one of the hot agendas, globally and nationally. The government of Ethiopia provides free maternal and pre delivery waiting services regardless of social and economic status of the women. But with this effort, still maternal mortality ratio is high at the national level [15]. PPH is one of the leading direct causes of maternal

morbidity and mortality in Ethiopia [16]. But there are only few studies done in the country and particularly in Amhara region.

Therefore, the findings of this study would contribute to the existing knowledge, to explore more about the magnitude and associated factors for PPH and help on the provision of emergency obstetric and gynecological care and functioning health facility based on evidence. Additionally, the finding would be used as baseline data for improving obstetric care in South Wollo by providing base line data for programs implementers and non-governmental organizations (NGOs). It also helps as an input for future planning and intervention for appropriate strategies to prevent maternal morbidity and mortality associated PPH and it would also use as a base line for the scientific community. So the objective of the study is to assess the magnitude and associated factors of PPH in Dessie Referral Hospital from 8th July 2015 to 7th June, 2016.

Methods and Materials

Study setting

The study was conducted at Dessie referral hospital which is located in Dessie town, 401 km away from Addis Ababa, Ethiopia and 482 km from Bahirdar. The catchment total population is estimated to be 8,000,000 of which females are 49.5% and reproductive age women are estimated to be 23.47%. Obstetric ward is the one that serves around 1500 clients per year. The ward is staffed with 3 gynecologist and 31 midwives who provides different maternal health services with a total of 31 beds. One year (8th July 2015 to 7th July, 2016) document review was done for this study.

Sample size determination and procedure

All mothers who were gave birth in Dessie referral hospital were the source and study population. The sample size was determined by using single population proportion, by considering the following assumptions. P=17% [4], Confidence level of 95%, Margin of error 4%. Therefore with this formula, and considering 10% non-response rate, the total sample size was 380 women's chart. All unique medical registration numbers of clients who have gave delivery from 8th July 2015 to 7th July, 2016 was selected from the delivery registration log book, sorted based on their unique medical registration number starting from least and was coded (1,2,3,4,...). Then, by using systematic sampling technique charts was selected. The selected charts were taken from the card room. Then, the trained BSc nurses were filled the required data from the selected charts. The required data which missed from clients chart was searched and filled in to the data extraction format from delivery and operation registration log books.

Study variables and measurement

Postpartum hemorrhage is the outcome variable of this study whereas, age, parity, ANC follow-up, mode of delivery, uterine atony, retained placenta, genital tract trauma, prolonged labor, types of pregnancy, Polyhydraminous were the independent variables that affects PPH. PPH is measured in this study with diagnosis of gynecologist (care provider) who gave deliver services in the hospital and recorded as PPH or not. The data was collected using structured data extracting format developed by using different literatures and client registration book. The data was collected by 4 trained BSc nurses. To assure the quality of data, detail training was given for one day. The data extraction format was pretested at Dessie referral hospital on women's chart not included one the sampling frame before the actual data collection has begun on 30 client card. Day today activities was supervised and corrected by principal investigator.

Data analysis

The completed questionnaire was checked for completeness and consistency by the principal investigator and the coordinators each day and code was given to the completed questionnaire. The data were entered using Epi Info version 3.5.1 and transferred to SPSS 20.0 statistical package for analysis. Data cleaning was performed to check for accuracy, consistencies, and values. Then errors were identified and corrected. Univariate analysis using frequency technique was used to describe the data according to some important characteristics of the study subjects. Then the data were expressed in percentage, means, medians and standard deviations. Then bivariate logistic regression was used to see the crude association between the independent variables and the dependent variable and the strength of association was expressed in Odds Ratio (OR). Variables with ($p<0.25$) were analyzed by using multivariate logistic regression to control confounding effects. For all statistical tests P-value ≤ 0.05 was used as a cut-off point for statistical significance.

Result

Reproductive history of women who give delivery in Dessie referral hospital

A total of 380 women charts were reviewed in this study. But 3 women's charts were not included in the analysis due to incompleteness. The mean age of women's was 28 years (SD 4). About 355 (94.2%) were married and about 61% were from rural dwellers. One 198 (52.5%) of participants were multipara and 50 (13.3%) had no ANC visit. Abnormalities detected during ANC follow-up were twin pregnancy 27 (7.2%) followed by APH 17 (4.5%). 50 (13.33%) deliveries were cesarean sections (Table 1).

Variables		Frequency	Percent
Age of mother	15-19	20	5.3%
	20-24	127	33.70%
	25-29	147	39%
	30-34	63	16.70%

	≥ 35	20	5.30%
Residence of the women	Urban	148	39.30%
	Rural	222	60.70%
Marital status	Single	22	5.80%
	married	355	94.20%
Parity	Primi Para	101	26.79%
	Multi Para	198	40.05%
ANC visit during the current pregnancy	No	50	13.30%
	Yes	327	86.70%
Gestational age during delivery in weeks	32-37 weeks	20	5.30%
	37-42 weeks	317	84.10%
	>42 weeks	40	10.60%
Place of delivery	Home	47	12.50%
	Institutional	330	87.50%
Mode of delivery	SVD	327	86.70%
	C/S	50	13.33%
Duration of labor	<24 hours	330	87.50%
	>24 hours	47	12.50%
Rapture of membrane before onset of labor	<12 hours	63	57.80%
	>12 hours	46	42.20%

Table 1: Reproductive history of women who give delivery at Dessie Referral Hospital, July 2015-2016 (n=377).

Proportion and causes of postpartum hemorrhage

About 22 cases of PPH were registered which makes the magnitude of PPH is 5.8% during one year period. The causes of PPH identified during the study period were uterine atony (45%) followed by retained placenta (40%) and genital tear (14%) (Figure 1).

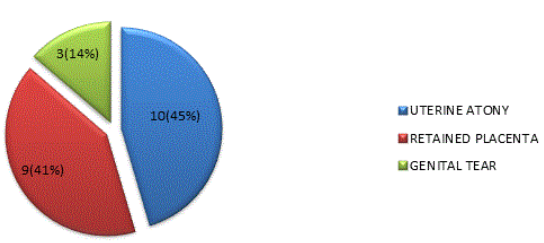

Figure 1: Causes of PPH in women who give delivery at Dessie Referral Hospital, 8th July 2015 to 7th July, 2016.

Factors associated with PPH

Different factors were analyzed for their independent effect on PPH. Delivering women who have not ANC follow-up were about eleven (AOR, 11.3, (30.2), 95% CI, 4.2-30.2) times more risk of developing PPH than those who have at least one ANC follow-up. Delivering women who had 24 hour and more duration of labor were eight (AOR, 8.3, 95% CI, 3.0-23.0) times more risk of PPH development as compared to these who had less than 24 hour duration of labor. Delivering women who had given delivery by cesarean section were about five (AOR, 5.3, 95% CI, 1.8-15.8) times more risk of developing PPH as compared to these who had given spontaneous vaginal delivery (Table 2).

Variables	Postpartum hemorrhage		COR	AOR
	Yes	No		
ANC				
No	12 (24%)	38 (76%)	10.0 (4.1, 24.7)	11.3 (4.2, 30.2)
Yes	10 (3.05%)	317 (96.8%)		
Duration of labor				
<24 hours	12 (3.6%)	318 (96.3%)		

≥ 24 hours	10 (21.2%)	37 (78.7%)	7.2 (2.9, 17.7)	8.3 (3.0, 23.0)
Mode of Delivery				
SVD	14 (4.3%	313 (96.3%)		
C/S	8 (16%)	42 (78.7%)	4.3 (1.7,10.8)	5.3 (1.8, 15.8)
Parity				
Primi Para	1 (0.99%)	100 (99%)		
Multi Para	7 (4.6%)	144 (95.36%)	4.9 (0.6, 40.1)	4.3 (0.6, 36.0)
Grand multi Para	14 (11.2%)	111 (88.8%)	12.6 (1.6, 97.6)	12.4 (1.6, 97.2)

Table 2: Factors associated with PPH among women who give delivery at Dessie Referral Hospital, July 2015-2016 (n=377).

Discussion

In a one year period the overall magnitude of PPH was 5.8% (22 of 377). The magnitude is relatively lower than previous studies. In Pakistan hospital [7.1%] and prospective study done at Gonder town (18%), Uganda (9%), Cameron (23%) [1,4,8,14]. The difference could be due to coverage differences of the study subjects and study design. Improvement of ANC services through time would contribute for the discrepancy. ANC is an important maternal health interventional area which reduces the occurrence of PPH by providing early diagnosis and treatment of preexisting disease, complications and health promotion and disease prevention actions like, feeding practice, personal hygiene which are essential services to decrease pregnancy related complications like PPH. Other justification would be, in Ethiopia institutional delivery utilization is increased from time to time which prevents PPH by removal of retained products, giving oxytocin for contraction of uterus. In our study the blood loss is estimated based on provider's observation and judgment. But other studies use standard blood loss measurements. In line with other findings, the commonest causes of PPH in this study are uterine atony (45%) and retained placenta (41%) [8,14].

ANC follow-up reduces occurrence of PPH. In Ethiopia Now a days, the government provides focused ANC for pregnant women based on evidence. Therefore pregnant women get interventions based on their problem. During ANC follow-up, potential risk factors for pregnancy related complications including PPH are predicted and interventions like, iron-follet supplementation, nutritional interventions are important actions to reduce PPH. During ANC service providers encourage institutional delivery, family planning utilization reduces high risk pregnancies (too many, narrow and late) which are potential risk factor for PPH. Prolonged labor increases the risk of PPH by eight folds. The result is supported by other literatures. As the duration of labor increases the risk of developing PPH also increases. Prolonged labor will also cause uterine atony [12,14].

Parity of the women had increase development of PPH. The finding is supported by other researches [1,8,13]. As the number of pregnancies and live birth increases the risk of PPH is high. Parity increases both the occurrence of secondary and primary PPH. Advanced age would increase the risk of anemia and blood coagulation problem which are responsible factors for PPH. Cesarean section increases the risk of PPH than vaginal delivery. The finding is supported by other researches [8-11]. Cesarean section increases the vasodilatation and most emergency cesarean section is performed to relief abnormal labor condition that that increases uterine atony.

Limitations

It mainly focuses on individual level factors and factors related to the health system and the service providers did not included, the socio cultural factors and related misconception on maternal health services feeding practices. So the study would not representative of the catchment area since women who were give delivery at home were not assessed. The data is secondary which makes us from detail analysis of different factors.

Conclusion and Recommendations

The overall magnitude of postpartum hemorrhage is low in this study when compared with previous studies. But still it needs the attention of the government to reduce maternal and child mortality and morbidity. Non utilization of ANC, cesarean section, prolonged duration of labor and multiparty are predictors of postpartum hemorrhage. Based on the findings the following recommendations were given. As maternal health services (ANC, institutional delivery and PNC) are potential times for counseling of mothers about post-partum FP, counseling about modern family planning should get more focus. There is great need to prioritize education of girls to empower them to use postpartum FP and policies need to encourage women to be supported by their spouses and to promote postpartum family planning. In addition there is need to improve the quality of knowledge on the recommended postpartum contraceptives to enable extended post-partum mothers make informed choices, which can be facilitated by strengthening client-provider interaction especially through maternal and child health services.

Ethical Consideration

Letter of ethical clearance was obtained from Wollo University collage of medical and health sciences, institutional health research ethics review committee about the importance of the research for the community and the harms that would be occurred during data collection. Official letter was written to Dessie referral hospital. Collection of clinical data from hospital registers and medical records is authorized by the hospital administrative and does not require women consent. Confidentiality of information was maintained by giving codes for women's chart rather than recording their name.

Authors' Contributions

MA was the principal investigator (conception and design of the study, acquisition of data, analysis of data, interpretation of data, and revising the paper), and also involved in data analysis, revising the paper and manuscript write-up.

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Competing interests

The author declares that he has no competing interest.

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