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Table of Contents   PAGE

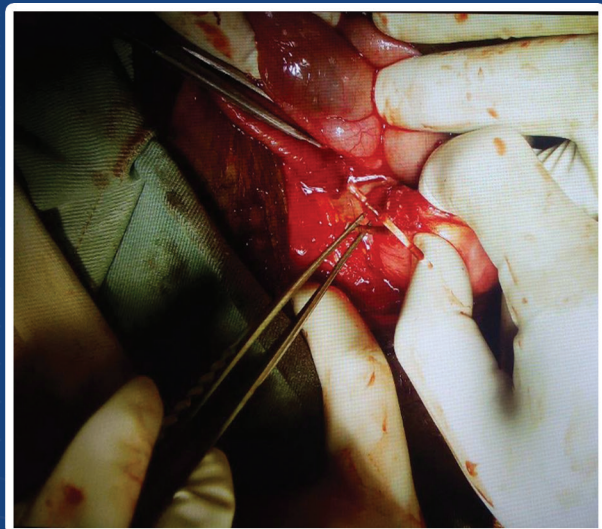# PREVALENCE AND DETERMINANTS OF MATERNAL AND PERINATAL OUTCOME OF PREECLAMPSIA AT A TERTIARY HOSPITAL IN ETHIOPIA

Awol Yemane Legesse MD[1], Yibrah Berhe MD[1], Sumeya Ahmed Mohammednur MHA[2], Hale Teka MD[1], Gelila Goba, MD[3]

ABSTRACT

INTRODUCTION: Preeclampsia is a common pregnancy disorder with potential adverse maternal and neonatal outcome. This study aimed to assess the prevalence and determinants of maternal and perinatal outcome of preeclampsia at Ayder Comprehensive Specialized Hospital. Ayder Comprehensive Specialized Hospital (ACSH), is a tertiary hospital in northern Ethiopia where most preeclamptic patients are treated.

METHODS: We performed a retrospective chart review of preeclamptic patients treated at ACSH between September 1, 2015 and August 31, 2018. Descriptive analysis and logistic regression were applied for different variables. P value <.05 was taken as statistically significant.

RESULTS: Over the study period, the total number of deliveries recorded was 8,502. There were 362 patients with preeclampsia. Poor maternal outcome was present in 40% of cases while 25% of cases had poor perinatal outcome. The top three poor maternal outcomes reported in this study were maternal death (2.8%), eclampsia (6.6%), and renal failure (1.1%). Headache (AOR 32.26 95% CI 0.03-32.60 and low hemoglobin value (AOR 15.94 95% CI 2.34-108.81) were associated with poor maternal outcome. The poor perinatal outcomes were still births (5.8%), early neonatal deaths (1.1%), and low APGAR score (18.8%). Earlier gestational age at diagnosis (AOR 2.15 95% CI 1.22-3.79) was associated with poor perinatal outcome.

CONCLUSIONS AND RECOMMENDATIONS: In a resource limited setting where diagnostic tools are scarce, clinical profile should be taken into consideration for prediction of poor outcome. Owing to the association found in between maternal outcome and hemoglobin, further prospective research is required to identify if anemia was the cause or effect of preeclampsia.

KEYWORDS: Preeclampsia, maternal, perinatal, outcome, Ayder, Ethiopia

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INTRODUCTION

Hypertension is the most frequent medical complication of pregnancy, occurring in 10% of pregnancies and being the main cause of perinatal mortality and morbidity1. Hypertensive disorders during pregnancy are classified into 4 categories, as recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy: Chronic hypertension, preeclampsia-eclampsia, preeclampsia superimposed on chronic hypertension, and gestational hypertension[2,3].

Preeclampsia is a common pregnancy specific disease with potential adverse maternal and neonatal outcome that affects 3–5% of all pregnancies1. The criteria that define pre-eclampsia have not changed over the past decade3. These are: onset at >20 weeks' gestational age of 24-hour proteinuria ≥30 mg/day or, if not available, a protein concentration ≥30 mg (≥1+ on dipstick) in a minimum of two random urine samples collected at least 4–6 hours but no more than 7 days apart, a systolic blood pressure >140 mmHg or diastolic blood pressure ≥90 mmHg as measured twice, using an appropriate cuff, 4–6 hours and less than 7 days apart, and disappearance of all these abnormalities before the end of the 12th week postpartum. Nonetheless, some presentations of pregnancy-related hypertension combined with clinical or laboratory abnormalities should also be considered as potential preeclampsia[2].

In developed countries preeclampsia represents one of the most frequent causes of maternal death (15% of all maternal deaths) and near-miss including eclampsia, placental abruption, pulmonary edema, and acute renal failure[4].

Preeclampsia is a major cause of perinatal mortality and morbidity. Neonates born to preeclamptic mother are nearly 2-fold at higher risk of neonatal death and at increased risk of neonatal suffering including poor APGAR scores, abnormal body movement and admission to neonatal intensive care unit5,6.

The markedly increased incidence of perinatal mortality seen in pregnancies affected by preeclampsia, although multifactorial, is mainly due to the need for preterm delivery and uteroplacental ischemia resulting in a poor blood flow towards the fetus[7].

The chance of severe preeclampsia is significantly increased in a woman with history of preeclampsia, with diabetes mellitus, chronic hypertension and multiple pregnancy[8].

Neonates born to preeclamptic mother are at higher risk of neonatal death and at increased risk of neonatal morbidity including low APGAR scores, seizures, and admission to neonatal intensive care unit5,6. Sadly, the poor perinatal of preeclampsia is more pronounced in developing countries than the developed ones due to destitute care provided to the newborns .

Even though there are few studies exploring hypertensive disorders of pregnancy in Ethiopia, there is a paucity of information regarding maternal and perinatal outcomes of preeclampsia in Tigray region and in Ethiopia at large. This study will generate information regarding the determinants of maternal and perinatal outcome, which may help in devising management protocols.

This study aimed to determine the prevalence of pre-eclampsia, and to assess the maternal and perinatal outcomes.

METHODS

The study design was a retrospective record review of all cases diagnosed to have and managed for preeclampsia in Ayder Comprehensive Specialized Hospital (ACSH) between September 1, 2015 and August 31, 2018. ACSH is located in Mekelle town, Tigray 783 km north of Addis Ababa (capital city of Ethiopia). ACSH is a teaching hospital for both undergraduate and postgraduate students and has 24 hours a day specialty care. Currently it is the second largest public hospital in Ethiopia serving catchment area for 8 million people from Tigray, Afar, and Amhara regional states. It is a tertiary hospital giving all types of care. In obstetrics and gynecology department, there are one sub specialist, 10 specialists, 35 residents and 75 midwives. The evaluations of patients are made by midwives, medical interns, residents, and seniors.

Operational definition

Unfavorable maternal outcome included maternal death, eclampsia, HELLP syndrome, pulmonary edema, hepatic hematoma, and intracranial/intracerebral hematoma.

Poor perinatal outcome included stillbirth, early neonatal death, low APGAR

Perinatal death included stillbirth and early neonatal death

Low APGAR score is fifth minute APGAR score < 6, excluding zero

Incomplete chart is a chart which lacks delivery summary (maternal vital sign at delivery, birth weight, neonatal sex, 5th minute APGAR score) and preeclampsia chart.

Pulmonary edema was defined as respiratory failure, confirmed by typical findings on chest X-ray or clinical chest findings).

Intracerebral hemorrhage was diagnosed by computerized tomography performed on clinical suspicion.

Hepatic hematoma is patients with severe upper quadrant abdominal pain with ultrasound confirmation.

Sever BP measurement is if SBP> 160 and / or DBP 110 mmHg

Elevated AST is AST value > 60

Elevated ALT is ALT value > 60

Elevated creatinine is creatinine value > 1.2

Low platelet is platelet count <100,000

Preeclampsia includes atypical preeclampsia and superimposed preeclampsia.

Preeclampsia with severity features is Preeclampsia with any of the following clinical presentation: cortical symptoms, vascular symptoms, eclampsia, pulmonary edema, sever BP measurement elevated liver enzymes, elevated creatinine, low platelet, and hepatic hematoma Emergency log book, labor ward log book, patients' card and gynecologic ward log book were used as a source of data. The data was collected by two midwives, two-year one obstetrics and gynecology residents, and five interns. Descriptive analysis and logistic regression were completed using SPSS version 20 (IBM, Armonk, NY, USA). Those variables with a P value<0.1 at univariate level were considered for binary logistic regression. P value <0.05 was taken as statistically significant. The study was approved by the research and community service committee of Mekelle University, College of Health Sciences. The data was not used for other purpose other than the objective of the study. Confidentiality of data obtained from chart review was maintained.

RESULTS

During the 3 years study period; the total number of deliveries was 8,502. There were 432 patients with preeclampsia, giving a magnitude of 5.08%. It was possible to retrieve the charts of 402 cases (93.05 chart retrieval rate). Forty patients were excluded because they had incomplete chart. The remaining analysis was made using 362 cases.

Majority 56.4 % of the mothers were in the age range between 25 to 34 years with a median age and standard deviation (SD) of 27 years (SD ± 5.27). The minimum and maximum ages of patients were 18 and 43 years respectively.

Majority 249 (69.8%) of the patients belong to rural residence. The mean parity was 1.5 and 33.4 % were primigravida. Seventy-four patients (20.4%) had previous history of abortion, and 95.8% of the patients received at least one antenatal care.

There were 6 patients who had previous preeclampsia one of which had unfavorable maternal outcome and 7 (1.9%) of the mothers in this study had chronic hypertension. There were 14 patients with twin pregnancies.

Table 1 Demographic characteristic of women with preeclampsia in ACSH September 2015-August 2018.

Characteristics	N	%
Maternal age		
18-24	115	31.8
25-34	204	56.4
>=35	43	11.8
Parity		
Primigravid	121	33.4
Multigravida	241	66.6
Locality		
Rural	249	68.8
Urban	113	31.2
ANC Booking status		
Unbooked	15	4.2
Booked	347	95.8
Gestational age in weeks at time of diagnosis		
<34	93	25.7
>34	241	66.6
Unknown	28	7.7

The most common presenting symptom was headache with 134 (37%). Other symptoms experienced were epigastric pain 91(25.1), right upper quadrant pain 80 (22.1 %), blurring of vision 69 (19.1%), and sever BP measurement 64 (17.7 %).

There were 71(19.6%) patients who were anemic. Other laboratory results were elevated aspartate transaminase (AST) 104 (28.7%), elevated alanine transaminase (ALT) 41 (11.3%), elevated creatinine 46 (12.7%), and low platelet 16 (4.4%).

Majority (66%) of the patients were diagnosed with preeclampsia at the gestational age of 34 weeks or above with mean gestational age and standard deviation (SD) of 35.3 weeks (SD±4.5). The minimum and maximum gestational age at diagnosis were 20 and 43 weeks respectively. Preeclampsia with severity features was the most prevalent diagnosis made to 280 (77.3 %) of the mothers.

There were 44 (12.2%) patients with unfavorable maternal outcomes. The unfavorable maternal outcomes reported in this study were eclampsia 24 (6.6%), HELLP syndrome 16 (4.4%), maternal death 10(2.8%), renal failure 4 (1.1%), pulmonary edema 3 (0.8%), intracranial hemorrhage 3 (0.8%), and hepatic hematoma 2 (0.6). Other obstetric complications were abruptio placenta 23 (6.4%) and oligohydramnios 8 (2.2%).

Table 2 Maternal outcomes of mothers with preeclampsia in ACSH, September 2015-August 2018

Maternal outcomes	N	%
Unfavorable outcomes		
Eclampsia	24	6.6
HELLP syndrome	16	4.4
Maternal death	10	2.8
Renal failure	4	1.1
Pulmonary edema	3	0.8
Intracranial hemorrhage	3	0.8
Hepatic hematoma	2	0.6
Obstetric complications		
Abruptio placenta	23	6.4
Oligohydramnios	8	2.2

The median prolongation of the pregnancy from diagnosis to termination of pregnancy was 1.82 days (range 0-42 days). Most of the mothers achieved vaginal delivery after induction 143 (39.5%), spontaneous vaginal delivery 142 (39.2%), emergency cesarean delivery 57 (15.7%), elective cesarean delivery 14 (3.8%), forceps delivery 4 (1.1%), and destructive delivery was done for two patients.

Table 3 Perinatal outcomes of mothers with preeclampsia in ACSH, September 2015-August 2018

Perinatal outcome	Type of preeclampsia	
	Preeclampsia without severity features N (%)	Preeclampsia with severity features N (%)
Birth weight in grams		
Weight >2500	68 (18.8)	161 (44.5)
Weight 1500-2499	13 (3.6)	93 (25.7)
Weight 1000-1499	1(0.3)	24 (6.6)
Poor Perinatal outcome		
Stillbirth	3 (0.8)	18 (4.9)
Early neonatal death	1(0.3)	3 (0.8)
Low APGAR score	9 (2.5)	59 (16.3)
Abortion	-15 (4.1)	

There were a total of 361 neonates and 15 abortions. The mean birth weight at delivery was 2570 grams. Normal birth weight (>2500 grams) accounted for 63.3%, low birth weight (1500-2499 grams) for 29.3%, and very low birth weight (1000-1499 grams) for 6.9%. Low birth weight and preterm deliveries were common in women who have preeclampsia with severity features than in those who were having preeclampsia without severity features. The mean gestational age at delivery was 36 weeks, term delivery 189 (52.2%), preterm delivery 130 (35.9), and unknown gestational age 28 (7.7%).

Of all cases 25% had poor perinatal outcome. The poor perinatal outcomes reported in this study were 25 perinatal deaths, giving perinatal mortality rate of 69.06 per thousand deliveries; 21 still births yielding the still birth rate of 5.81%; there were 4 early neonatal deaths, and 68 (18.8%) cases with low APGAR score.

Predictors of unfavorable maternal outcome

After univariate analysis, hemoglobin value at admission, gestational age at admission, aspartate amino transferase vale (AST), alanine amino transferase value (ALT), headache, right upper quadrant pain, blurring of vision, and address, were found to be candidates in the binary logistic analysis for the final model. Therefore, a multivariate approach was applied to determine which factors best explained and predict unfavorable maternal outcome. The outcome of the final multiple logistic regression models indicated that address, gestational age, ALT value, right upper quadrant pain stay dropped from the final model. In this analysis, abnormal AST value has significant statistical association with unfavorable maternal outcome of preeclampsia (AOR = 91.7, 95% CI: 3.08-2718.24). The presence of headache and blurring of vision as a presenting complaint have statistical association with unfavorable maternal outcome of preeclampsia (AOR = 32.26, 95% CI: 0.03-32.60) and (AOR = 9.1, 95% CI: 0 .02-62.10) respectively.

Table 4. Univariate and multivariate binary logistic regression on factors associated with unfavorable maternal outcomes.

Variable		Unfavorable maternal outcome	COR (95%CI)	AOR (95%CI)
Address	Rural	36	2.2 (0.99-4.90) *	6.8 (0.91-52.05)
	Urban	8	1	1
Gestational age at diagnosis	<34 weeks	23	3.84 (1.98-7.46) *	1.07 (0.19-5.98)
	>34 weeks	19	1	1
Headache	Yes	26	28 (0.09-67.80) **	32.26 (0.03-32.60) *
	No	18	1	1
Right upper quadrant pain	Yes	16	2.28 (0.23-8.64) *	7.90 (0.39-57.53)
	No	28	1	1
Blurring of vision	Yes	24	7.3 (0.70-26.9) *	9.09 (0.02-62.1) *
	No	20	1	1
AST	Elevated	37	21.28 (0.19-116.01) *	91.57 (3.08-2718.24) *
	Normal	6	1	1
ALT	Elevated	15	5.21 (0.19-11.60) *	4.34 (0.05-1.19)
	Normal	28	1	1
Hemoglobin	<10 g/dl	26	3.44 (1.77-6.76) *	15.94(2.34-108.81) *
	>10g/dl	18	1	1

AST- Aspartate amino Transferase, ALT- Alanine amino Transferase, 1- logical reference, *-P<0.05, *- P<0.01

Predictors of poor perinatal outcome

Address, gestational age at diagnosis, maternal age, parity, history of abortion, order of pregnancy, headache, right upper quadrant pain, blurring of vision, epigastric pain, AST, ALT, platelet, hemoglobin, and creatinine were included in the univariate analysis. Address, gestational age at diagnosis, and maternal age were statistically significant at a univariate level. After multivariate binary logistic regression, gestational age at diagnosis less than 34 weeks was found to have significant association with poor perinatal outcome (AOR = 2.15, 95% CI: 1.22-3.79).

Table 5. Univariate and multivariate binary logistic regression on factors associated with poor perinatal outcomes.

Variable		Unfavorable maternal outcome	COR (95%CI)	AOR (95%CI)
Address	Rural	62	2.2 (0.99-4.90) *	2.14(0.75-4.72)
	Urban	31	1	1
Gestational age at diagnosis in weeks	<34 weeks	34	2.5 (1.49-4.37) **	2.15 (1.22-3.79) *
	>34 weeks	56	1	1
Maternal age in years	>35	15	2.28 (0.26-10.42) *	2.01(0.31-9.65)
	18-34	78	1	1

1- logical reference, *-P<0.05, *- P<0.01,

DISCUSSION

The prevalence of preeclampsia observed in the present study (5.08%) is consistent with an institutional study done by Wagnew et al. in Ethiopia which reported proportion of 4.2%[11]. our studies prevalence is higher than a study done by Gaym et al. which was 1.2%. The discrepancy is explained by lower institutional delivery in the latter study[12].

In our study preeclampsia with severity features was the most prevalent diagnosis made (77.3 %). This may be due to late diagnosis of preeclampsia as most patients were diagnosed after 34 weeks considering the progressive nature. Moreover majority (69.8%) of the patients were rural dwellers leading to delayed seeking of medical care. In this study, unfavorable maternal outcome was present in 12 % of the preeclampsia cases. This is lower than a retrospective cross sectional study conducted among women with preeclampsia/ eclampsia delivering in Addis Ababa selected government hospitals, with a presence of maternal complication for 36% of the cases. The decreased maternal complication might be attributable to difference in operational definition of unfavorable maternal outcome. Aspiration pneumonia was included as unfavorable outcome and diagnosis of HELLP syndrome was not clear in the latter study. Both HELLP syndrome and aspiration pneumonia contributed to majority of unfavorable maternal outcome in the retrospective cross-sectional study[11]. Eclampsia, HELLP syndrome and maternal death were the leading unfavorable maternal outcomes which is comparable to a study done by Seyum et al.[13]. In developing countries pregnancy related acute renal failure may be as high as 36% and is responsible for maternal mortality and morbidity[14]. Our study revealed the occurrence of acute renal failure to be 1.1%, which is relatively low this might be due to improved health care and more effective measures. More over our hospital is well equipped compared to other hospitals in low resource setting.

In this analysis, abnormal AST value has significant statistical association with unfavorable maternal outcome of preeclampsia. The odds of unfavorable maternal outcome is 90 times higher if the AST is elevated. This finding is in line with a study done by James N. Martin et al. which reported maternal complication to be associated with elevated liver enzymes[15]. The presence of headache and blurring as a presenting complaint were also associated with unfavorable maternal outcome. Both neurologic symptoms have been reported in previous studies to signify an imminent eclampsia[10]. Hemoglobin value less than 10 was associated with unfavorable outcome. Though this finding is consistent with previous reports, it might be problematic to identify if severe anemia was the cause or effect of preeclampsia in this study as the anemia was detected at admission and may have been a consequence of the disease process (hemolysis in HELLP syndrome).

In present study, there were 93 poor perinatal outcomes including 21 still births,5 early neonatal deaths, and 68 neonates with low APGAR score. Similar to this finding, previous studies reported neonates born to preeclamptic mothers have higher still birth rates and low 1st and 5th minute APGAR scores16,17. There was strong association between gestational age less than 34 weeks and poor perinatal outcomes. This finding is consistent with literatures which report rates of all poor birth outcomes were significantly higher among women with early gestational age at onset of preeclampsia (<34) compared with late onset(>34)13,15,17,18.

The rate of low birth weight in this study was 35% which is consistent with a WHO secondary analysis which reported low birth rate of 32-36% for Sub-Saharan countries19.

Limitation of the study

This study had limitations. Due retrospective nature of the study design, it was difficult to obtain some sociodemographic data. As a result, it was difficult to control all possible determinants of maternal and perinatal outcomes including confounders to the association of low hemoglobin value with poor maternal outcome. Due to smaller sample size wider range of confidence interval was observed for hemoglobin and AST at multivariate level. Additionally, since our data relied on record review, which might not be correctly recorded may introduce bias with gestational age.

CONCLUSIONS

The present study highlighted high magnitude of poor maternal and perinatal outcomes which is similar to studies done in developing countries. The analysis showed that headache, blurring of vision, low hemoglobin, and elevated AST value were associated with unfavorable maternal outcome, while early onset disease is associated with poor perinatal outcome. Thus highighting that, in a resource limited setting where predictive and diagnsotic tools are scarce, clinical profile of women can be taken into consideration for prediction of poor outcome. Further prospective study should be done to control the confounders not addressed in this retrospective study.

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REFERENCES

1. Patrick Saudan MAB, Megan L. Buddle and Michael Jones. Does gestational hypertension become pre-eclampsia? British Journal of Obstetrics and Gynaecology. November 1998;Volume 105(Issue 11):1177-1 184.

2. Barton JR, O'Brien JM, Bergauer NK, Jacques DL, Sibai BM. Mild gestational hypertension remote from term: Progression and outcome. American Journal of Obstetrics and Gynecology. 2001;184(5):979-83.

3. Alessia Mammaro SC, Alessandro Cavaliere, Santina Ermito, Angela Dinatale, Elisa Maria Pappalardo, Mariapia Militello, and Rosa Pedata. Hypertensive Disorders in Pregnancy. J Prenat Med. 2009 Jan-Mar;3(1):1-5.

4. Khan KS WD, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death a systematic review. a systematic review Lancet 2006;367:1066-74.

5. Basso O RS, Weinberg CR, Wilcox AJ, Irgens LM, Skjaerven R. Trends in fetal and infant survival following pre-eclampsia. JAMA. 2006;296:1357-62.

6. Creanga AA, Syverson C, Seed K, Callaghan WM. Pregnancy-Related Mortality in the United States, 2011-2013. Obstetrics and gynecology. 2017;130(2):366-73.

7. Sibai GADaBM. Etiology and pathogenesis of preeclampsia: Current concepts. American Journal of Obstetrics and Gynecology. 1998;vol. 179(no. 5):pp. 1359–75.

8. Catov JM, Ness RB, Kip KE, Olsen J. Risk of early or severe preeclampsia related to pre-existing conditions. International Journal of Epidemiology. 2007;36(2):412-9.

9. Teklu S GA. Prevalence and clinical correlates of the hypertensive disorders of pregnancy at Tikur Anbessa Hospital, Addis Ababa, Ethiopia. Ethiop Med J. 2006 Jan;44(1):17-26.

10. Abalos E, Cuesta C, Carroli G, Qureshi Z, Widmer M, Vogel JP, et al. Pre-eclampsia, eclampsia and adverse maternal and perinatal outcomes: a secondary analysis of the World Health Organization Multicountry Survey on Maternal and Newborn Health. BJOG : an international journal of obstetrics and gynaecology. 2014;121 Suppl 1:14-24.

11. Wagnew M, Dessalegn M, Worku A, Nyagero J. Trends of preeclampsia/eclampsia and maternal and neonatal outcomes among women delivering in addis ababa selected government hospitals, Ethiopia: a retrospective cross-sectional study. The Pan African medical journal. 2016;25(Suppl 2):12.

12. Gaym A, Bailey P, Pearson L, Admasu K, Gebrehiwot Y. Disease burden due to pre-eclampsia/eclampsia and the Ethiopian health system's response. International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics. 2011;115(1):112-6.

13. Seyom. Maternal and fetal outcome of pregnancy related hypertension in Mettu Karl Referral Hospital, Ethiopia. Journal of Ovarian Research. 2015;8(10).

14. Aali BS GJ, Mohamad-Alizadeh S. Severe preeclampsia and eclampsia in Kerman, Iran: complications and outcomes.>. Med Sci Monit. 2004;10(4):CR163–7.

15. James M, et Early risk assessment of severe preeclampsia: Admission battery of symptoms and laboratory tests to predict likelihood of subsequent significant maternal morbidity Am J Obstet Gynecol 1999;180:1407-14.

16. Mandana S, et al. Maternal and neonatal outcomes in women with preeclampsia. Taiwan J Obstet Gynecol. 2007;46(3):255–9.

17. Q.E. Harmon LH, D.M. Umbach, K. Klungsoyr, S.M. Engel, P. Magnus. Risk of fetal death with preeclampsia. Obstet Gynecol (3) (Mar 2015) 2015;125(3):628–35.

18. Witlin ea. predictors of neonatal outcome in women with severe preeclampsia or eclampsia between 24 and 33weeks'gestation. Am J Obstet Gynecol 2000;182(3):607-11.

19. Bilano VL OE, Ganchimeng T, Mori R, Souza JP. Risk factors of preeclampsia/eclampsia and its adverse outcomes in low and middle-income countries: A WHO secondary analysis. PloS one. 2014;9(3):e91198.

MAGNITUDE AND FACTORS ASSOCIATED WITH LOW BIRTH WEIGHT AMONG WOMEN DELIVERED IN PUBLIC HOSPITALS OF BENCH MAJI, KEFFA AND SHEKA ZONES SOUTH WEST OF ETHIOPIA, 2018

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ABSTRACT

BACKGROUND: The burden of low birth weight has decreased dramatically worldwide in the past 40 years. Despite this, there is still a large gap between the developing and developed countries. Ethiopia is one of the developing countries with limited data on the prevalence and main risk factors of low birth weight. Therefore; providing information on this problem is very important for planning maternal and child health care services.

OBJECTIVE: To assess the magnitude and factors associated with low birth weight among women delivered at Mizan-Tepi university teaching hospital, Tepi general hospital, Wacha hospital and Gebretsadik Shawo hospitals Southwest, Ethiopia, 2018.

METHODS: A cross-sectional study was conducted at selected hospitals on all women who gave birth during study period. Data was entered to Epidata version 3.1 and exported to SPSS version 20 for analysis. Logistic regression analysis was carried out to identify associated factors at confidence interval of 95% and significance level of P-value<0.05.

RESULT: The magnitude of low birth weight was 7.5%. Educational status of the mother [AOR 3.6, 95% CI (1.46-8.92)], iron intake during pregnancy [AOR 2.88, 95% CI (1.37-6.05)], Current pregnancy complication [AOR 5.98, 95% CI (3.37-10.62)], induced labor [AOR 2.37, 95% CI (1.08-5.12)] and gestational age [AOR 37.61, 95% CI (20.61-68.56)] were significantly associated factors with low birth weight.

CONCLUSION: The magnitude of low birth weight was found to be high in the study area. Educational status of the mother, iron intake during pregnancy, pregnancy complication, induced labor and gestational age were identified predictors of low birth weight.

KEY TERMS: Low Birth Weight, Pregnancy, Delivery, Women.

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INTRODUCTION

Low birth weight (LBW) is an important adverse outcomes of pregnancy as it is significant in determining neonatal morbidity and mortality, inhibited growth and cognitive development, and chronic diseases later in life1. Family members and professionals who provide prenatal, maternity or postpartum cares are likely to confront an unexpected adverse birth outcome like low birth weight during their professional career2.

Low birth weight (LBW) is defined by the World Health Organization (WHO) as weight at birth less than 2500g. It might be classified as low birth weight (birth weight <2500g), very low birth weight (birth weight <1500g) and extremely low birth weight babies (birth weight < 1000 g)[3-6].

Low birth weight is the highest among the adverse pregnancy outcomes and common in developing countries contributing to 60% to 80% of all neonatal deaths worldwide and estimated that 18 million low birth weight babies born attributing to nearly 14% of all live births[7,8].

The level of low birth weight is estimated to 16.5% in developing countries which is two-fold higher than the level observed in developed countries 7 %9.

Low birth weight infants run the risk of developing many complications includes respiratory distress, sleep apnea, heart problems, jaundice, anemia, chronic lung disorders, and infections are just some of the obstacles that low birth weight babies may face. In addition, it places financial and emotional burdens on families and communities[10].

Like other developing countries, in Ethiopia low birth weight is still major public health problem. However, studies on this area are not sufficient. Therefore, this study aimed to assess magnitude and factors associated with low birth weight among women delivered in the study area.

METHODS AND MATERIALS

Study area and period

The study was conducted in public hospitals found in Bench Maji, Sheka and Keffa zones namely, Mizan Tepi University teaching hospital, Tepi general hospital, Wacha hospital and Gebretsadik Shawo hospital from February 01- March 30, 2018. Mizan Tepi University Teaching Hospital (MTUTH) is located in Bench Maji zone, 560 kms away from Addis Ababa. The two hospitals: Gebretsadik Shawo and Wacha hospitals are found in kefa zone at a distance of 441 and 520 kms away from Addis Ababa respectively, while Tepi general hospital is located in Sheka zone, 565 Kms away from capital city of Ethiopia, Addis Ababa[11].

Study Design

Facility based cross-sectional study design with quantitative data collection method was used.

Source and study population

All mothers who delivered in the four hospitals were considered as source of population and those who gave birth during the study period were considered as study population.

Inclusion and exclusion criteria

All laboring mothers who gave birth at MTUTH, Tepi, Gebretsadik Shawo and Wacha public hospitals were included in the study; however multiple birth, mothers who were critically ill and unable to communicate during data collection were excluded from the study.

Sample Size Determination

The sample size was calculated by using a single population proportion sample size calculation formula considering the following assumptions. d = margin of error of 2% with 95% confidence interval, p=proportion expected prevalence of adverse birth outcome are 25% and considering none response rate of 10%. Then the final sample size became 1980.

Sampling Technique

The total sample size (1980) was allocated to the four public hospitals. The sample size allocation was based on the source of population from each hospital. The source of population of each hospital was taken from six month report of deliveries. Then the average was considered as source of population. The study participants were consecutively interviewed from each hospital until the calculated sample size achieved.

Operational definitions and Definition of terms

Low birth weight: is defined as a birth weight below 2500 grams.

Baby weight: The weight of a neonate taken right after birth and/or within first hour after home delivery using ordinary baby weight scale.

Data collection Instruments

The data was collected using pre-tested structured questionnaire and anthropometric measurements. The English version of questionnaire was developed based on instruments applied in different related studies [12-16] then translated in to Amharic by experts and then translated back to English to check for consistency. This questionnaire contains different sections for assessing low birth weight, demographics and associated factors.

Data collectors

Twelve midwives with BSc degree were recruited purposefully as data collectors from their respective facilities for which they caring to maintain the quality of the data. Four MSc holders in fields of health were recruited as a supervisor.

Data Collection Procedure

Data was collected through face to face interview, measurements and reviewing of medical record of the mother and newborn using pre-tested structured questionnaire and check list by trained data collectors. Data was collected day and night not to miss the cases. Last normal menstrual period (LNMP) was confirmed from her chart and client report. Gestational age was calculated based on the last normal menstrual period (LNMP). When LNMP-based gestational age is unknown, we relied on ultrasonography measures from chart.

Data Processing and Analysis

EPI data Statistical software version 3.1 and Statistical Package for Social Sciences (SPSS) software version 21.0 was used for data entry and analysis. After organizing and cleaning the data, different descriptive statistics were calculated to all variables related to the objectives of the study. Likewise, variables with P- value of less than 0.25 in binary logistic regression analysis was entered into the multivariable logistic regression analysis to control confounders to determine the separate effects of the various factors associated with low birth. Odds ratio with 95 % confidence interval was used to examine associations and variable with P value less than 0.05 was considered significant. Finally the result was presented by using tables, charts and narrative form.

Data Quality control measures

The data quality was assured by using validated pre-tested questionnaires. Consequently, actual was collected on 5% of the total study eligible subjects with similar characteristics at Mizan Health Center. Finally the necessary amendments were made to the tool. The validity of the tool was checked by face validity. Data collectors were trained for two days intensively on the study instrument and data collection procedure that includes the relevance of the study, objective of the study, confidentiality of the information, informed consent and interview techniques. The data collectors worked under close supervision. Supervisors reviewed the filled questionnaires at the end of data collection every day for completeness. There was regular morning session to discuss on potential and faced problems to take timely corrective actions. Moreover, the data was carefully entered and cleaned prio to the beginning of the analysis.

Ethical Considerations

A letter of approval was obtained from Mizan-Tepi University and further permissions were taken from respective Medical Directors of the selected health facilities. After explaining the objectives of the study in detail, informed written consent was taken from all study participants promising that everything will be kept private.

RESULT

Socio-demographic characteristics

The response rate for the study was 100%. Around half 905(45.7%) of the participants were from rural area, and one fourth 505(25.5%) of the study participants were unable to read and write. Most of the respondents 1911(96.5%) were married and majority 1562(78.9%) of them were house wife regarding their occupation (Table 1).

Table. 1. Socio-demographic characteristics of women delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones, Southwest Ethiopia, 2018.

Variables	Category	Frequency	Percent (%)
Age	15-19	178	9
	20-24	854	43.1
	25-29	585	29.5
	30-34	230	11.6
	35+	133	6.7
Residence	Rural	905	45.7
	Urban	1075	54.3
Educational status	Unable to read and write	505	25.5
	Able to read write	413	20.9
	Primary education	643	32.5
	Secondary education	263	13.3
	College and above	156	7.9
Marital status	Married	1911	96.5
	Single	40	2
	Divorced	7	0.4
	Widowed	10	0.5
	Separate	12	0.6
Religion	Orthodox	897	45.3
	Muslim	404	20.4
	Protestant	679	34.3
Occupation	Housewife	1562	78.9
	Merchant	177	8.9
	Gov't employee	126	6.4
	Non-gov't employee	22	1.1
	Daily labor	93	4.7

Table. 2 Obstetric characteristics of women delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones Southwest, 2018.

Variables	Category	Frequency	Percent (%)
APregnancy status	Intended	1888	95.4
	Unintended	92	4.6
ANC follow-up	Yes	1826	92.2
	No	154	7.8
Iron supplement	Yes	1664	84
	No	316	16
Complication during current pregnancy	Yes	266	13.4
	No	1714	86.6
Hypertensive disorders of pregnancy	Yes	90	33.8
	No	176	66.2
APH	Yes	54	20.3
	No	212	79.7
Gestational age	<37weeks	182	9.2
	≥37	1798	90.8
Complication during current labor	Yes	385	19.4
	No	1595	80.6
Status of current labor	Spontaneous	1737	87.7
	Induced	243	12.3
Alive birth	Yes	1801	91
	No	179	9
Birth weight	<2500gm	148	7.5
	≥2500gm	1832	92.5
Anemia (using Hgb)	Yes	378	19.1
	No	1602	80.9
Nutritional status (using MUAC)	Under nutrition	546	27.6
	Normal	1434	72.4

Obstetric characteristics

From the total study participants almost all 1888(95.4%) of the pregnancy were intended. Majority 1826(92.2%) of the participants have antenatal care (ANC) follow-up and also 1664(84%) respondents supplemented iron during current pregnancy. Regarding complication 266(13.4%) and 385(19.4%) mothers developed complication during pregnancy and delivery respectively. Majority 1737 (87.7%) of the participants' onset of labour were spontaneous and only 378 (19.1%) of the participants had anemia during labour and child birth (Table 2).

Magnitude of low birth weight

The magnitude of low birth weight in this study was 148 (7.5%) with 95 % CI (6.3-8.7%). The mean value of low birth weight was 3.3kg with standard deviation of ± 5.6 kg.

Factors associated with low birth weight

Mothers who can write and read were three times more likely to have low birth weight as compared to mothers with educational level secondary and above [AOR 3.6, 95% CI (1.46-8.92)]. Mothers who didn't take iron during pregnancy were three times more likely to have

low birth weight as compared to their counterpart [AOR 2.88, 95% CI (1.37-6.05)].

Mothers who develop complication during pregnancy were six times more likely to have low birth weight as compared to normal pregnancy [AOR 5.98, 95% CI (3.37-10.62)]. Mothers with induced labor were two

times more likely to have low birth weight as compared to spontaneous labor [AOR 2.37, 95% CI (1.08-5.12)]. Mothers who have preterm delivery were thirty seven times more likely to have low birth weight as compared to their counterpart [AOR 37.61, 95% CI (20.61-68.56)] (Table-3).

Table. 3: Factors associated with low birth weight among mothers who delivered in public hospitals of Benchi-Maji, Kaffa and Sheka zones Southwest, 2018.

Variable	Category	Low birth weight		COR(95% CI)	AOR (95% CI)
		Yes	No		
Residence	Rural	93	812	2.12(1.50-3.00)	1.05(0.56-1.96)
	Urban	55	1020	1	1
Educational status	Can't read & write	51	454	3.03(1.68-5.46)	0.75(0.27- 2.10)
	Read and write	36	377	2.57(1.39-4.77)	3.61(1.46-8.92)*
	Primary education	46	597	2.08(1.14-3.77)	1.77(0.70-4.22)
	Secondary school and above	15	404	1	1
History of medical illness	Yes	11	288	0.43(0.23-0.81)	0.57(0.25-1.30)
	No	137	1544	1	1
ANC follow up	Yes	105	1721	1	1
	No	43	111	6.35(4.24-9.51)	0.56(0.21-1.55)
Intake Iron folate	Yes	64	1600	1	1
	No	84	232	9.05(6.36-12.89)	2.88(1.37-6.06)*
Current pregnancy complications	Yes	75	191	8.83(6.19-12.60)	5.98(3.37-10.62)*
	No	73	1641	1	1
Current delivery complication	Yes	41	344	1.66(1.14-2.42)	0.60(0.35-1.12)
	No	107	1488	1	1
Status of current labour	Spontaneous	111	1626	1	1
	Induced	38	205	2.65(1.77-3.94)	2.37(1.08-5.20)*
Nutritional status	Normal	79	467	1	1
	Under nutrition	69	1365	3.35(2.38-4.70)	0.95(0.53-1.70)
Anemia (using HGB)	Yes	64	314	3.68(2.60-5.21)	1.80(0.98-3.28)
	No	84	1518	1	1
Gestational age	37 and above weeks	43	1755	1	1
	Less than 37 weeks	105	77	55.66(36.50-8487)	37.61(20.63-68.58)*

*= Statistically significant, 1= Reference category

Discussion

Low birth weight is public health concerns throughout the world. Developing countries are with the highest rates of this adverse birth outcome. In this study, the magnitude and associated factors of low birth weight

was assessed among women delivered at hospitals found in Bench Maji zone,Kefa and Sheka zone.

This study revealed that the magnitude of low birth weight in the study area was 7.5% with 95% CI (6.3-8.7%). The finding of the study was similar with the

previous studies done in Tanzaniza 8% and Hosana (8.6%) [13,16]. This finding is lower than the studies conducted in Gambia (10.5%) [17], Kenya (12.3%) [18], Tigray (14.6%) [19], Adawa general hospital (10%) [20], Gondar university hospital (11.2%) [14] and Gondar Public health institution (17.4%) [15]. The difference might be due to study period: currently increased antenatal care coverage and health seeking behavior of mothers before and during pregnancy helps in early detection and treatment of pregnancy and non-pregnancy related problems might decrease the chance of getting LBW. Increasing antenatal care utilization at national and regional level gives a chance for pregnant mothers to get advice on danger sign, diet, rest and personal hygiene that can lowers low birth weight. The other possible reason for the lower magnitude of low birth weight in this study might be due to improved socio-economic status of the community from time to time which has direct or indirect impact on fetal weight during pregnancy.

Even though the prevalence of low birth weight in this study is lower than other study in the country, it needs the professionals' intervention like effective counseling about fetal growth and development, dietary and danger signs preconception as well as during pregnancy to prevent problem which result short and long term fetal problems.

This study revealed that educational status of the mother, pregnancy complication, and iron supplementation during pregnancy, induced labor and gestation age of the neonate were significantly associated with low birth weight. This finding is consistent with studies conducted in China, India, Nigeria, Tanzania, Gambia, Gondar and Hossaina [15-17, 21-24]. Mothers who develop pregnancy complication were six times more likely to have low birth weight as compared to their counterpart. This may be due to the fact that pregnancy complication can force to terminate the pregnancy before term and result in low birth weight. This finding is consistent with studies conducted in China, India, Gambia and Gondar [15, 17, 21, 22]. This finding is also in line with the studies conducted in Adawa general hospital and Kenya (18, 20). Mothers who didn't intake iron were more likely to have low birth weight. This may be due to low hemoglobin level and low formation of erythrocytes results in low supply of oxygen to the fetus. Low oxygen concentration supply may affect fetal metabolism and result in low birth weight.

Even though in Ethiopia under five children death is in declining trend, neonatal death remained high. Low birth weight is one of the causes of neonatal death and long term complication. So, health care providers should focus on provision of iron supplementation and prevention of pregnancy complication. In addition to this, based on the educational status, care providers should give clear information about danger sign of pregnancy, diet, personal hygiene and iron folate supplementation every antenatal visit.

In general from this study it can be concluded that the magnitude of low birth weight in the study area was found to be high. Educational status of the mother, iron intake during pregnancy, pregnancy complications, induced labor and gestational age were factors significantly associated with low birth weight. The effort of regional health bureau, zonal health departments and district health offices is important in improving nutritional status of the mothers, prevention and management of obstetric complications and also the obstetric care providers should give an attention on early diagnosis and management of maternal complications during pregnancy to reduce the rate of LBW.

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REFERENCES

1. Kramer MS. The Epidemiology of adverse pregnancy outcomes: An overview. The Journal of Nutrition. Canada, American Society for Nutritional Sciences, 2003.

2. American College of Obstetricians and Gynecologists. Management of stillbirth. ACOG practice bulletin no. 102. Obstet Gynecol. 2009; 113 (3):748-761.

3. Resolution WHA65.6. Comprehensive implementation plan on maternal, infant and young child nutrition. In: Sixty-fifth World Health Assembly Geneva, 21–26 May 2012. Resolutions and decisions, annexes. Geneva: World Health Organization; 2012:12–13 (http://www.who.int/nutrition/ topics/WHA65.6_resolution_en.pdf?ua=1, accessed on 17 October 2017).

4. Cunningham FG, leveno KJ, Bloom SL, Hauth JC, Rouse DC, spong CY. Williams Obstetrics.23rd edition year .McGraw-Hill Companies, 2010.

5. Risnes KR, Vatten LJ, Baker JL, Jameson K, Sovio U, Kajantie E et al. Birthweight and mortality in adulthood: a systematic review and metaanalysis. Int J Epidemiol. 2011; 40:647–61. doi:10.1093/ije/dyq267.

6. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. Lancet. 2008; 371(9606):75–84. Doi: 10.1016/S01406736 (08)60074-4.

7. Althabe F, Bhutta Z, Blencowe H, Chandra-Mouli V, Chou D, Costello A, Cousens S, Davidge R, Johnson JG: In born too soon: The global action report on preterm birth. Edited by Christopher Howson MK, Joy L. Geneva, Switzerland: WHO; 2012.

8. WHO: Guide lines on optimal feeding of low birth weight infants in low and middle income countries. Geneva, Switzerland: World Health Organization 2011.

9. UNCIEF, WHO, Low birth weight: country, regional and global estimates, Executive summary, New York , 2004

10. March of Dimes, "Quick Reference Fact Sheets: Low Birth Weight," 2009. Available at: http://www.marchofdimes.com/professionals/. Accessed date:28/09/2017

11. Gudeta TA, Regassa TM . Prevalence of Pregnancy Induced Hypertension and Its Bad Birth Outcome among Women Attending Delivery Service. J Preg Child Health 4: 355. doi:10.4172/2376-127X.1000355

12. Judith R. Bale, Barbara J. Stoll, Adetokunbo O. Lucas. Improving Birth Outcomes: Meeting the Challenge in the Developing World. National Academies Press ISBN: 978-0-309-08614-12003, PP 8-32.

13. Deborah WJ, Helen AW, John Mc, James T, Balthazar G, Judith B, Rebecce B, David M, .Adverse birth outcome- impact and prevention of maternal risk factors ;Bulletin of the World Health Organization | January 2007, 85 (1)

14. Adane et al. adverse birth outcomes among deliveries at Gondar University Hospital, Northwest Ethiopia. BMC Pregnancy Childbirth, BMC Pregnancy and Childbirth; 2014; 14(1):1–8. [Open access]

15. Zenebe K Awoke T, Birhan N. Low Birth Weight & Associated Factors Among Newborns in Gondar Town, North West Ethiopia : Institutional Based Cross- Sectional Study. Indo Global Journal of Pharmaceutical Sciences 2014; 4(2): 74-80.

16. Abdo RA, Endalemaw TB, Tesso FY. Prevalence and associated Factors of Adverse Birth Outcomes among Women Attended Maternity Ward at Negest Elene Mohammed Memorial General Hospital in Hosanna Town, SNNPR, Ethiopia. J Women's Health Care; 2016, 5: 324. doi: 10.4172/2167-0420.1000324

17. Abdou Jammeh, Johannes Sundby, Siri Vangen. Maternal and obstetric risk factors for low birth weight and preterm birth in rural Gambia: a hospital-based study.Open Journal of Obstetrics and Gynecology 2011, 1, 94-103

18. Onesmus Maina Muchemi, Elizabeth Echoka, Anselimo Makokha. Factors associated with low birth weight among neonates born at Olkalou District Hospital, Central Region, Kenya. Pan African Medical Journal. 2015; 20:108 doi:10.11604/pamj.2015.20.108.4831

19. Meresa Gebremedhin, Fentie Ambaw, Eleni Admassu, Haileselassie Berhane. Maternal associated factors of low birth weight: a hospital based cross-sectional mixed study in Tigray, Northern Ethiopia. BMC Pregnancy and Childbirth (2015) 15:222

20. Yisak Gebregzabiherher, Abera Haftu, Solomon Weldemariam, Haftom Gebrehiwet. The Prevalence and Risk Factors for Low Birth Weight among Term Newborns in Adwa General Hospital, Northern Ethiopia, Obstetrics and Gynecology International Volume 2017, Article ID 2149156, 7 pages https://doi.org/10.1155/2017/2149156

21. Pankaj Kumar, Prasad Pore, Usha patil. Maternal anemia and its impact on perinatal outcome in a tertiary care Hospital of Pune , in Maharashtra .Indian Journal of Basic & Applied Medical Research; March 2012: Issue-2, Vol.-1, P. 111-119

22. Chen Y, Li G, Ruan Y, Zou L, Wang X, Zhang W, Chenet al. An epidemiological survey on low birth weight infants in China and analysis of outcomes of full-term low birth weight infants. BMC Pregnancy and Childbirth 2013,13:242

23. Agarwal, et al. Prevalence and determinants of "low birth weight" among institutional deliveries. Annals of Nigerian Medicine 2011 ; Vol 5 , Issue 2

24. Siza JE. Risk factors associated with low birth weight of neonates among pregnant women attending a referral hospital in northern Tanzania. 2008; 10(1):1–8.

PMTCT SERVICE UTILIZATION AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING PUBLIC HEALTH FACILITIES IN HAWASSA CITY, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND: Among various interventions to control HIV transmission, prevention of mother-to-child transmission program have been implemented to offer a range of related services to the women and their infants. In Ethiopia, although the overall trend of the program coverage has shown improvements over time, studying its utilization and identifying factors that influence the utilization among pregnant women could have paramount importance for improving the service by addressing important bottlenecks. The aim of this study was to determine the utilization of prevention of mother-to-child transmission service and its associated factors among pregnant women attending public health facilities in Hawassa City, Southern Ethiopia.

METHOD: Institution based cross-sectional study was conducted among pregnant women who visited six public health facilities for Antenatal Care service. A sample of 588 pregnant women having at least two Antenatal Care visits were included in the study using a systematic sampling technique. Trained nurses collected the data using the Amharic version structured questionnaire that was pretested before the actual data collection. The collected data were entered and analyzed using Epi info version 7.0 and Statistical Package of Social Science version 20 statistical software respectively. Bivariable and multivariable logistic regression analysis was conducted and we reported both crude and adjusted odds ratios with 95% confidence intervals.

RESULT: Among the study subjects, 531 (90.3%) utilized prevention of mother-to-child transmission service for their current pregnancy. Pregnant women having only two antenatal care visits were 76% less likely to utilize the service as compared to pregnant women having three or more antenatal care visits [AOR= 024, 95% CI=0.11,0.53]. Pregnant women who do not support the idea that every pregnant woman should be tested for HIV/AIDS were 91% less likely to utilize prevention of mother-to-child transmission service as compared to those who support the idea [AOR= 0.09, 95% CI= 0.03, 0.29]. Finally, pregnant women who don't know the view of her partner regarding HIV testing were 96% less likely to utilize the service as compared to pregnant women having a partner who supports couple counseling [AOR=0.04, 95% CI= 01, 12].

CONCLUSION AND RECOMMENDATION: Nearly all of the study subjects utilized prevention of mother-to-child transmission service for their current pregnancy. The number of antenatal care visits, the view of the women on supporting the idea that every pregnant should be tested for HIV and the view of husband regarding HIV screening were found to be the major predictive factors. Encouraging partner involvement on the importance of HIV testing could have an important contribution to further improve the utilization of prevention of mother-to-child transmission service. Further studies to document the best practice of the prevention of mother-to-child transmission service should be undertaken.

KEY WORDS: PMTCT, Utilization, Public Health Facilities, Hawassa, Southern Ethiopia

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BACKGROUND

According to the 2016 UNAIDS report, globally 36.7 million people were living with HIV/AIDS. Nearly 18 million and 2.1 million of them were women aged >15 years and children <15 years respectively. Sub-Saharan African region remains the worst affected region in the world accounting for 64% of all people with new HIV infections from the global community1. In 2017, there were an estimated 613,000 people living with HIV in Ethiopia, of whom 62 % were women. The HIV prevalence among women and men aged 15-49 in Ethiopia was 0.9 % while the prevalence among women age 15-49 was 1.2% with a peak of 3% in the age group 40-44 years. Between 2000 and 2017, Ethiopia has witnessed a marked reduction in HIV/AIDS morbidity and mortality through its leadership commitment and country ownership of the HIV response program. This is evidenced by the development of relevant policy frameworks; series of strategic plans; national policy and technical guidelines, and implementation plans for strengthening the overall national response2.

Among various interventions, Prevention of Mother-To-Child Transmission (PMTCT) program has been implemented to offer a range of services to women and their infants. These include preventing HIV infections among women of reproductive age (15–49 years), preventing unwanted pregnancies among women living with HIV, and providing women living with HIV a lifelong ART to maintain their health and prevent transmission during pregnancy, labour and delivery, and breastfeeding3. The scale-up of the PMTCT of HIV services is one of the greatest public health achievements in recent times. Nevertheless, the global pace of progress is slowing as indicated by the UNICEF projects that if the reduction in new pediatric HIV infections continues at the same rate, there will be 100,000 new infections among children in 2020 alone, in relation to the 20,000 super-fast-track targets4. In line with the global commitment, attaining virtual elimination of Mother-To-Child Transmission (MTCT) is among the strategic objectives of national HIV prevention Road Map that serves as a framework for the prevention response during the years 2018-20202.

Although the overall trend of PMTCT service utilization in Ethiopia has shown improvements in overtime, studies identified various barriers to the implementation of PMTCT of HIV services including socioeconomic and cultural factors affecting the uptake of Voluntary Counseling and Testing (VCT) services, initiation of ARV prophylaxis, and loss to follow-up after starting ARV for PMTCT5. Therefore, studying the utilization of PMTCT service and identifying factors that influence the utilization among pregnant women in different parts of the country could have paramount importance for improving the service utilization by addressing important bottlenecks. The aim of this study was to determine the utilization of PMTCT service and its associated factors among pregnant women attending public health facilities in Hawassa City, Southern Ethiopia.

METHOD

Study Area, Study Design and Population: This study was conducted in Hawassa, a capital city of the Southern Regional State of Ethiopia, which is located 273 km South of Addis Ababa. There were a total of four public health centers and two public hospitals in the city. The study was carried out from September 2015 to May 2016 among all health facilities in Hawassa City namely: Hawassa referral hospital, Hadare hospital, Hadare health center, Alamora health center, Millennium health center, and Tula health center. Institution based analytic cross-sectional study was conducted. All pregnant women who showed up to the health facilities with at least one previous ANC visit were included in the study. Those pregnant women who were seriously ill were excluded from the study.

Sample Size and sampling technique: The minimum required sample size for this study was obtained using a single population proportion formula. The assumptions considered included: the prevalence of PMTCT service utilization (p=72.8%), taken from a study conducted in East Hararge Zone of Oromia Regional State of Ethiopia (6), the reliability coefficient for 95% CI, 4%

margin of error and 20% for non-response. Accordingly, 591 pregnant women were required for the study. The calculated sample size was proportionally allocated to the health facilities considering the total number of pregnant women who had been attending the Antenatal Care (ANC) service at the selected facilities during the previous three months period. A systematic sampling procedure employed to select the study subjects based on the average number of daily ANC visits of each of the health facilities and the planned number of data collection per day. Accordingly, the selected pregnant women were invited to take part in this study right after completing their routine ANC visit.

Data Collection Procedures and Data Quality Control: A structured questionnaire that was initially prepared in English was used for the data collection. The questionnaire was translated into Amharic and back translated to English to ensure the consistency of the translation language. Six nurse data collectors (one from each health facilities) and two supervisors who were fluent Amharic speakers were recruited and trained for two days on the data collection and supervision procedures. The data collectors administered the questionnaire after obtaining verbal informed consent from selected pregnant women. Pretest of the data collection tool involving the data collectors and supervisors was conducted on 5% of sample size in Yirgalem hospital. Close supervision of the data collection procedures were also employed. The investigators and the supervisors were reviewed the questionnaires to make sure the completeness and consistency. To reduce data entry error, experienced data clerks conducted double data entry procedure.

Data Analysis: The collected data were entered and analyzed using Epi info version 7.0 and Statistical Package of Social Science (SPSS) version 20 statistical software respectively. Descriptive analysis was used to summarize the characteristics of the study subjects. Bivariable logistic regression analysis was used to assess the association between each of the independent variables and the utilization of PMTCT service.

Multivariable logistic regression analysis was conducted using significant variables and both crude and adjusted odds ratio with 95% confidence interval were reported. Ethical considerations: Ethical clearance for the study was obtained from the Institutional Ethical Review Board (IRB) of Addis Ababa University School of Public Health. Administrative permissions were also obtained from the participating institutions including the Regional Health Office, Hawassa City Administration Health Offices and the Health Facilities. The detail nature and objective of the study was fully explained to all pregnant women participated in the study before the data collection and verbal informed consent was received.

RESULT

A total number of 591 pregnant women were approached to take part in the study and 588 of them were willing to take part included in the study with a response rate of 99.4%. The mean (±SD) age of the study subjects was 24.74 (+4.34). Almost all 578 (98.3%) of the study subjects were married and 341(58%) of them were protestants by religion. Four hundred forty-four (75.5%) of the study subjects attended formal education while 338 (57.5%) of them were housewives. With regard to the number of ANC visit, 374 (63.6%) of the study subjects had 3 or more ANC visit for their current pregnancy and the overwhelming, 473 (80.4%) have two or less alive children [Table 1].

Table 1: Socio-demographic Characteristics of the Pregnant Women Attending ANC Service in Public Health Facilities of Hawassa City, Southern Ethiopia, 2016

Variables	Category	Frequency	Percent (%)
Marital Status	Married	578	98.3
	Other	10	1.7
Religion	Orthodox	163	27.7
	Muslim	53	9
	Catholic	31	5.3
	Protestant	341	58
Educational Level	No formal Education	144	24.5
	Formal Education	444	75.5
Occupation	Housewife	338	57.5
	Government employed	111	18.9
	Self employed	123	20.9
	Other	16	2.7
Number of ANC Visit	Two	214	36.4
	Three or more	374	63.6
Number of Alive Children	Two or Less	473	80.4
	Three or more	115	19.6

Nearly all of the study subjects 563 (95.75%) heard about MTCT and for very large minorities 244 (41.50%) of them, health institutions were reported as a major source of information. To assess the MTCT related knowledge of the women, they were asked whether HIV could be transmitted from mother to child through pregnancy, labour and delivery, and breastfeeding. Accordingly, 373 (63.435%), 397 (67.52%) and 489 (83.16%) of the study subjects reported that HIV-Positive women can transmit the virus to her baby/ies during pregnancy, during labour and delivery and during breastfeeding respectively.

Two-third 404 (68.70%) of the study subjects also reported that HIV-positive pregnant women could use medication for PMTCT. Furthermore, nearly all 555(94.40%) of pregnant women support the idea that very pregnant should be tested. Among the partners of the participated pregnant women, 429 (72.96%) of them were tested for HIV and more than half 311 (52.90%) of partners have a view that support couple testing [Table 2].

Table 2: HIV and MTCT Related Characteristics of the Pregnant Women Attending ANC Service in Public Health Facilities of Hawassa City, Southern Ethiopia, 2016

Variables	Category	Frequency	Percent (%)
Heard about MTCT	Yes	563	95.75
	No	25	4.25
Source of information	Health institution	244	41.50
	Media (TV, radio,...)	165	28.06
	Traditional ceremony (idir,...)	122	20.75
	Relatives	22	3.74
	Friends	35	5.95
MTCT of HIV during pregnancy	Yes	373	63.44
	No	215	36.56
MTCT of HIV during labour and delivery	Yes	397	67.52
	No	191	32.48
MTCT of HIV during breastfeeding	Yes	489	83.16
	No	99	16.84
Support the idea that very pregnant should be tested	Yes	555	94.40
	No	33	5.60
The availability of medication for PMTCT	Yes	404	68.70
	No	184	31.20
Partner ever tested for HIV	Yes	429	72.96
	No	159	27.04
Partner view on HIV testing	Support couple testing	311	52.90
	A wife should be tested alone	177	30.10
	I don't know	100	17.00

Among the study subjects, 531(90.3%) utilized PMTCT service for their current pregnancy. Among them, all of them were received the test result and 510 (96.04%) were negative and the remaining 21 (3.96%) were positive for HIV.

To identify factors independently associated with the utilization of PMTCT services, which is an outcome variable, bivariable logistic regression analysis was used.

Accordingly, educational level, the number of ANC visits, supporting the idea that every pregnant woman should be tested for HIV, partner ever tested for HIV and the view of partner on HIV testing were found to have association with the utilization of PMTCT service. The knowledge that HIV-Positive women could transmit the virus to her baby/ies during pregnancy, labor/ delivery and breastfeeding and the knowledge of the availability of medication for PMTCT were also found to be significantly associated with the utilization of PMTCT service (p<0.2). Based on the finding of multivariable logistic regression model, the most important factors associated with the utilization of PMTCT service were having the number of ANC visits, the view of the women on supporting the idea that every pregnant should be tested and the view of partner on HIV testing. Pregnant women having only two ANC visits were 76% less likely to utilize PMTCT service as compared to pregnant women having three or more ANC visits [AOR=.024, 95% CI=0.11,0.53]. Pregnant women who do not support the idea that every pregnant woman should be tested for HIV/AIDS were 91% less likely to utilize PMTCT service as compared to those who support the idea [AOR= 0.09, 95% CI=0.03, 0.29]. Finally, pregnant women who don't know the view of her partner on HIV testing were 96% less likely to utilize PMTCT service as compared to pregnant women having a partner who supports couple counseling [AOR=0.04, 95% CI=.01, 12] [Table 3].

Table 3: Factors Associated with the Utilization of PMTCT Service among Pregnant Women Attending ANC Service in Public Health Facilities of Hawassa City, Southern Ethiopia, 2016

Variables	Utilized PMCT	Not-utilized PMTCT	COR (95%CI)	AOR (95%CI)
Educational Level				
Formal Education	410	34	1	1
No formal Education	121	23	0.44(0.25, 0.77)	0.89(0.38,2.11)
Number of ANC Visit				
Three or more	351	23	1	1
Two	180	34	0.35(0.20, 0.61)	0.24(0.11,0.53)*
MTCT of HIV during pregnancy				
No	177	38	0.25(0.14, 0.45)	0.69(0.27,1.77)
Yes	354	19	1	1
MTCT of HIV during labour and delivery				
No	153	38	0.20(0.11, 0.36)	0.75(0.29, 1.94)
Yes	378	19	1	1
MTCT of HIV during breastfeeding				
No	77	22	0.27(0.15, 0.48)	0.85(0.33, 2.18)
Yes	454	35	1	1
The availability of medication for PMTCT				
No	154	30	0.37(0.21,0.64)	1.03(0.46, 2.30)
Yes	377	27	1	1
Support the idea that every pregnant should be tested				
No	13	20	0.02(0.01, 0.05)	0.09(0.03, 0.29)*
Yes	518	37	1	1
Partner ever tested for HIV				
No	115	44	0.08(0.04, 0.16)	0.61(0.22, 1.67)
Yes	416	13	1	1
Partner view on HIV testing				
I don't know	29	71	0.02(0.01, 0.04)	0.04(0.01, 0.12)*
A wife should be tested alone	140	37	0.31(0.14, 0.68)	0.40(0.15, 1.06)
Support Couple testing	285	26	1	1

DISCUSSION

The study finding indicates that more than nine out of ten study subjects 531(90.3%) were utilized the PMTCT service for their current pregnancy. The study finding is consistent with similar studies conducted in different parts of Ethiopia such as the studies conducted in Sebeta Town,[5], Addis Ababa City[7], Assosa town,[8] and East Hararge Zone[6] and other developing countries such as Cameroon[9]. The higher level of PMTCT service utilization could be explained by the fact that the introduction of various intervention strategies and quality improvement programs in Ethiopian public health system could have attracted more pregnant women who have been utilizing the PMTCT services. The leadership commitment and the ownership of the HIV response program by the Ethiopian government to strengthening the overall national response could also have the lion share for the observed higher level of utilization[2].

The number of ANC visit that the women had for their current pregnancy also have significantly associated with utilization of PMTCT service where those who have three or more ANC visits were more likely to use PMTCT service. In a study conducted in Addis Ababa City, women with two or more prenatal clinic visits were more likely to be tested for HIV (10). A similar study conducted in the East Hararge Zone also revealed that the previous ANC visits were significantly associated with the utilization of PMTCT service[6].

The view of the women on supporting the idea that every pregnant should be tested for HIV showed a statistically significant association with utilization of PMTCT service. Studies also demonstrated that earlier information on HIV transmission routes and the knowledge of MTCT and PMTCT that are assumed to be the major pillars to support the idea of every pregnant should be tested for HIV were associated with the utilization of PMTCT service[6,11,12].

In this study, the view of the husband on HIV screening was also significantly associated with utilization of PMTCT service where to pregnant women having a partner who supports couple counseling were more likely to utilize PMTCT service. Other studies conducted previously found out similar finding where having a discussion with husband on HIV testing, having a plan to disclose the test results to husbands and family and community support have a significant association with the utilization of PMTCT[5,8,13]. Other studies were also identified the lack of communication within the couple, the reluctance of men to learn their HIV status, the misconception by men that their spouse's HIV status was a proxy of theirs, and the unwillingness of women to get their partners involved due to fear of domestic violence, stigmatization or divorce were among the individual factors[14]. The cross-sectional nature of the study and the inclusion of the study subjects from only the health facilities were some of the limitations of the study.

CONCLUSION AND RECOMMENDATION

Among the study subjects, more than nine out of ten of them utilized PMTCT service for their current pregnancy. Among those who utilized the service, all of them were received the test result and 510 (96.04%) were negative and 21 (3.96%) were positive for HIV. Among various factors included in the study, the number of ANC visit that the women had for their current pregnancy, supporting the idea of every pregnant should be tested for HIV and the view of husband on HIV screening were found to be the major predictor factors affecting the utilization of PMTCT service. In the recommendation, while working to improve the utilization of PMTCT service, all concerned bodies should pay attention to the major factors affecting the utilization. Improving the wider use of ANC service could offer an opportunity to engage more women that are pregnant in the PMTCT service. Targeting the partners of pregnant women and encouraging their involvement could also have an important benefit for promoting PMTCT service in the Ethiopian context. Further studies to document the best practice of the PMTCT intervention of the study area should be undertaken.

ABBREVIATIONS

ANC: Antenatal Care; AOR: Adjusted Odds Ratio, COR-Crud Odds Ratio; MTCT: Mother-To-Child Transmission; PMTCT: prevention of Mother-To-Child Transmission; VCT: Voluntary Counseling and Testing

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REFERENCES

1. UNAIDS. UNAIDS DATA 2017. Avenue Appia, Geneva, Switzerland; 2017.

2. FHAPCO. HIV Prevention in Ethiopia National Road Map 2018-2020. Addis Ababa, Ethiopia; 2018.

3. WHO. Prevention of mother-to-child transmission (PMTCT) of HIV. Avenue Appia, Geneva, Switzerland; 2018.

4. UNICEF. CHILDREN AND AIDS: Statistical Update. 2017.

5. Merga H, Woldemichael K, Dube L. Utilization of Prevention of Mother-to-Child Transmission of HIV Services and Associated Factors among Antenatal Care Attending Mothers in Sebeta Town , Central Ethiopia. Adv Public Heal [Internet]. 2016; Available from: http://dx.doi.org/10.1155/2016/6250898

6. Gobena M, Nigatu T, Yimam B, Tasisa A, Wagaw D, Birmechu F, et al. Utilization of Prevention of Mother to Child transmission (PMTCT) services and factors that affect knowledge and service uptake among pregnant women attending antenatal care in East Hararge Zone of Oromia Reginal State. Ethiop J Heal Dev. 2014;28(Special Issue 1):26–35.

7. Deressa W, Seme A, Asefa A, Teshome G, Enqusellassie F. Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa , Ethiopia. BMC Pregnancy Childbirth [Internet]. 2014;14:328. Available from: http://www.biomedcentral.com/1471-2393/14/328

8. Abtew S, Awoke W, Asrat A. Acceptability of provider - initiated HIV testing as an intervention for prevention of mother to child transmission of HIV and associated factors among pregnant women attending at Public Health Facilities in Assosa. BMC Res Notes [Internet]. 2015;8:661. Available from: DOI 10.1186/s13104-015-1652-4

9. George A, Njukeng PA, Ndasi JA, Mbuagbaw LT. Prevention of mother-to-child transmission of the Human Immunodeficiency Virus: investigating the uptake and utilization of maternal and child health services in Tiko health district, Cameroon. Pan Afr Med J [Internet]. 2015;20. Available from: http://www.panafrican-med-journal.com/content/article/20/20/full/

10. Negash TG, Ehlers VJ. Prevention of Mother-to-Child Transmission of HIV in Ethiopia : A Literature Review. ARC J AIDS. 2016;1(1): 7–13.

11. Alemu YM, Ambaw F, Wilder-smith A. Utilization of HIV testing services among pregnant mothers in low income primary care settings in northern Ethiopia : a cross sectional study. BMC Pregnancy Childbirth. 2017;17:199.

12. Ejigu Y, Tadesse B. HIV testing during pregnancy for prevention of mother-to-child transmission of HIV in. PLoS One. 2018;13(8). Available from: https://doi.org/10.1371/journal. pone.0201886

13. Peltzer K, Skinner D, Mfecane S, Shisana O, Nqeketo A, Mosala T. Factors influencing the Utilisation of Prevention of Mother-to-Child Transmission (PMTCT) Services by Pregnant Women in the Eastern Cape , South Africa. Heal SA GESONDHEID. 2005;10(1): 26–40.

DETERMINANTS OF PERINATAL MORTALITY IN ARBA MINCH GENERAL HOSPITAL, GAMO ZONE, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND: Perinatal mortality is one of the major challenges for under-five mortality contributing three fourth of deaths in neonatal period. In Ethiopia the magnitude of perinatal mortality is among the highest in Sub Saharan Africa which ranges 66 to 124 per 1000 births. Factors affecting perinatal death varies among countries with related to the health care provided, therefore identifying this factors is important. The objective this study was to assess determinants of perinatal mortality in Arba Minch Hospital.

METHODS: A facility based case control study was conducted using a pre-tested check list on 821 documents (274 cases & 547 controls) reviewed from January 2017 to June 2017 in Arba Minch hospital. Descriptive statistics was used to describe the status of study population and multi-variable logistic regression used to establish predictors of perinatal mortality.

RESULT: A total of 821 (274 cases & 547 control) documents of included mothers were reviewed. The study indicated that majority of cases 218(79.6%) & controls 429(78.5%) age were (20-34). About 213(77.7%) for case & 490(89.6%) for the control had ANC follow up, 262(95.6%) cases and 106(19.4%) of the controls had at least one type of obstetric complication & 524(95.8%) of controls & 247(90.1%) of cases were cephalic. This study identifies obstetric complication (AOR178.941; 95%CI (70.052, 457.087)), use of partogaraph (AOR 8.970; 95%CI (4.801, 16.759); gestational age (AOR 0.507; 95% CI (0.261, 0.987)) and mode of delivery (AOR 0.167; 95% CI (0.084, 0.331)) as factors that determine perinatal mortality.

CONCLUSION & RECOMMENDATION: History of obstetric complications, use of partograph; gestational age and mode of delivery were factors associated with perinatal mortality. Therefore, hospital staffs particularly those working at MCH need to give particular emphasis on use of Partogaraph & identifying obstetric complication at the time of ANC follow up & delivery.

KEY WORDS: perinatal mortality, still birth, Case control, early neonatal death.

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INTRODUCTION

The perinatal mortality (PNM) is defined neonatal deaths of less than seven days of age and fetal deaths after 28 weeks of gestation for developing countries, where the survival rate of preterm newborns is very low, the numerator for PMR includes all fetal deaths with gestational age of 28 weeks and above and all neonatal deaths within 7 days of life1. Perinatal mortality is one of the global health problems even though variations in distribution among countries exist. Every year about 7.5million perinatal deaths occur across the worldwide, 3.5 million are stillbirths & the remaining early neonatal death2,3,4. Ninety seven percent of globally reported stillbirths and ninety eight percent of neonatal deaths occurred in developing countries[3].

Perinatal deaths in developed countries are falling & in average estimated to 10 per 1000 live births5. In Africa in particular east Africa, perinatal mortality estimated on average 58 per 1000 live births6,7. Ethiopia is among the top ten countries with high perinatal mortality rate contributing about 4% the world's neonatal deaths8. Hospital based study conducted in Ethiopia show that perinatal mortality rate ranges from 66 up to 124 per 1000 births[1,8].

Perinatal mortality is used as an indicator for the quality of care provided to mothers during pregnancy, delivery & the postnatal period and their babies3. About 75% of perinatal deaths are said to be avoidable & determinants vary by country. With the availability and quality of health care, therefore understanding perinatal mortality in relation to factors is crucial. Findings from studies conducted in different parts of the world reveal that perinatal mortality is associated with many factors including; socio-demographic, obstetric, newborn, medical & health care system factors[2,9].

In spite of many efforts by the government and other partners; non-significant decline in perinatal mortality has been achieved in the country as a whole. Particular to study area, important services as neonatal care is providing as strategy to reduce perinatal mortality. So conducting a study on determinants of perinatal mortality and coming up with some understanding of the underlying determinants which might be peculiar to women in study area helps to formulate strategies for prevention and addressing the identified challenges. Therefore, the aim of this study was to identify factors that are associated with perinatal mortality in Arba Minch General hospital that may be very crucial for improvement and effectiveness program.

METHODS & MATERIAL

Institution based unmatched case control study was carried out from January 2017 to June 2017 using a data of July 8/2011-July 7/2016 in Arba Minch hospital.

Study population for case consisted of selected still births or early neonatal deaths in Arba Minch Hospital during the specified period. Study population for control consisted of those selected births discharged alive from the hospital during the specified period. Those births in Arba Minch Hospital from July 8/2011-July 7/2016 were included & study units for which the card number stated in delivery book lost were excluded.

The sample size was determined using of Epi-Info stat-calc based on a study with the assumption that at least 76.5% of controls & 67.25% case used partograaph, with odds ratio of 0.53, at 95% level of confidence, 80% power and alpha of 0.05 (1). The final sample size was 821(274 cases& 547 controls). Population proportion to year allocated & cases were selected randomly with 2 controls for each delivered on the same day & discharged alive.

Data was collected using pretested data abstraction form which address variables including socio demographic, Obstetric, medical & new born. The data abstraction form was prepared in English language & translated to Amharic language and back to English to assure consistency of the tool. The data collectors and supervisors were trained for two days (a day before the pretest and a day after the pretest). After pretest discussion was carried out with the team and some corrections and changes were made on the questionnaires.

The dependent variable was perinatal mortality which stands for stillbirths (fetal loss after 28 weeks of gestation)

and neonatal deaths before discharge from the hospital. The completed questionnaire was checked for completeness, consistency and entered in to EPi- Data version 3.1 and exported to SPSS version 16 for analysis. Univariate analysis was done using frequency, percentage, tables & charts. An association between perinatal mortality and independent variables was assessed using logistic regression. Those variables associated at Bivariate logistic regression with significance level of p value < 0.25 was entered into multivariate logistic regression model to identify determinants after controlling possible confounding effects. Multi-variable analysis was done to assess individual effect of variables on perinatal mortality. Crude and adjusted odds ratio with 95% confidence interval was calculated using binary logistic regression; p-value less than 0.05 was considered as statistically significant.

Ethical clearance was obtained from Ethical Review committee of Arba Minch University College of Public Health and Medical Sciences. Permission was obtained from both Arba Minch town health department and Arba Minch hospital. Confidentiality of information and privacy of participants' interviewwas respected; the names of the informants were not included in the questionnaire.

RESULT

Socio demographic characteristics

A total of 821 (274 cases & 547 control) documents of included mothers were reviewed with the mean age of 26±5.25 & 24.29±4.88 for cases & controls respectively. Majority of cases 218(79.6%) & controls 429(78.5%) age was b/n 20-34. Table (1)

Table 1.Socio demographic characteristics of mothers with perinatal deaths (cases) and controls in Arba Minch hospital, Ethiopia.2017

Variables	Category	Cases	Controls
Marital age	<20yr	21(7.6%)	76(13.9%)
	20-34yr	218(79.6)	429(78.5%)
	>=35	34(12.4%)	35(6.4%)
	Not registered	1(0.4%)	7(1.2%)
Marital			
	Married	251(91.6%)	524(95.8%)
	Widowed	1(0.4%)	2(0.4%)
	Divorced	1(0.4%)	1(0.2%)
	Not registered	21(7.6%)	20(3.6%)

Obstetrics characteristics of respondents

Eighty-four (30.5%) cases & 270(49.2%) controls were prim-gravida. One third of cases and quarter of control were with parity b/n 2-4. About 213(77.7%) of case & 490(89.6%) for the control had ANC follow up. Majority of mothers were vaccinated with TT2 209(76.3%) case & 490(89.6%) control, SVD 200(72.9%) case & 412(75.3%) control, no history of abortion 245(89.4%) case & 497(90.9%) control. Fifty-one (6.2%) mothers had previous history of abortion, 28(10.2%) & 1(0.4%) cases & 18(3.3%) and 2(0.4%) of controls had previous history of stillbirth and early neonatal death respectively.

Medical factors

Seven hundred seventeen (87%) mothers were screened for HIV with majority 704(98.2%) being non-reactive and 13(1.6%) were reactive. Hemoglobin level was determined for 703(85.6%) of mothers during ANC follow up or before delivery. The minimum level of hemoglobin was 4.5gm/dl & maximum of 16gm/dl with mean value of 12.10±1.971 m/dl. Proportion of anemia was 71(30.4%) in cases and 14(14.9%) in controls. About 262(95.6%) mothers of the cases and 106(19.4%) of the controls had at least one type of obstetric complication. (Table 2)

Table 2. Obstetric complications of mother's with perinatal deaths (cases) and control in Arba Minch hospital, Ethiopia.2017

Variables	Category	Cases	Controls
Any obstetric complication	Yes	262(95.6%)	106(19.4%)
	No	11(4.0%)	438(80.1%)
	Unknown	1(0.4%)	3(0.5%)
Type of obstetric complication	APH	31(12.4%)	11(2.0%)
	Obstructed labor	18(7.2%)	4(0.8%)
	Hypertensive disorders of pregnancy	54(21.6%)	24(4.4%)
	Mal-presentation	8(3.2%)	0
	PROM	18(6.8%)	35(6.4%)
	Cord accident	9(3.3%)	4(0.7%)
	Congenital malformation	27(10.8%)	0
	Uterine rapture	15(5.5%)	0
	IUFD	95(38.0%)	0
	Other	12(4.8%)	7(1.4%)

Newborn related factors

Findings about presentation of child during delivery showed that 247(90.1%) of cases &524(95.8%) of controls were cephalic. Concerning the type of delivery 791(96.4%) of mothers delivered single newborn & 25(3.0%) delivered multiple newborns with comparable proportion between cases and controls. More than half of newborns (56.3%) reviewed were male. About 622(75.8%) of new born weight was found b/n 2.5-4kg. The mean birth weight of newborns was 3000±814 gm. with a minimum of 300 and maximum of 5000gm. Very low birth weight & low birth weight newborns were more common in cases representing 42(15.3%) &66(24.1%)respectively.

Health care factors

Partogaraph was used in 546(66.5%) of total study subjects during labour. The proportion of mothers who delivered without partogaraph follow up was 152(55.5%) in cases and 89(16.3%) in control groups. Among 259 stillbirths, 16(6.4%) of them were admitted to the hospital having positive fetal heart beat and later reported as stillbirth during the course of labor and delivery.

Factors associated with perinatal mortality

An association between perinatal mortality and independent variables was assessed using logistic regression. Those variables associated at Bivariate logistic regression with significance level of p value < 0.25 was entered into multivariate logistic regression model to identify determinants after controlling possible confounding effects. The effects of different independent variables were tested for perinatal mortality using multivariable logistic regression analysis. Among variables parity, age, number of abortion, ANC, place of ANC follows-up, history of chronic disease, TT vaccination, history still birth, the level of hemoglobin, mode of presentation & newborns weight were not statistically significant factors associated with perinatal mortality. However, history of obstetric complication, use of partogaraph, gestational age & mode of delivery were significantly associated with perinatal mortality.

This study has shown that mothers who have history of obstetric complications had 178.941 times higher risk of perinatal death in the perinatal period than mothers who had no history of obstetric complications with AOR 178.941;95% CI (70.052, 457.087). This study has shown that mother who doesn't have partogaraph follow up had 8.970 times higher risk of perinatal death in the perinatal period than those who followed using partogaraph with AOR 8.970; 95%CI (4.801,16.759). This study has shown that mother who deliver at term had 0.507 times lesser risk of perinatal death in the perinatal period than mother who deliver at pre-term with AOR 0.507; 95% CI (0.261, 0.987). This study has also shown that mother who deliver C/S had 0.167 times lesser risk of perinatal death in the perinatal period than to those who deliver by SVD with AOR 0.167; 95% CI (0.084, 0.331).   (Table 3)

Table 3. The association between different factors and perinatal mortality, Arba Minch hospital, Ethiopia.2017

Variable	Category	Case	Control	p-value	Crude odd ratio(95%CI)	Adjusted odd ratio(95%CI)
Level of Hemoglobin	>=11	163(69.7%)	393(85.1%)		1	1
	8-10.9	54(23.1%)	61(13.2%)	0.884	2.134(1.418, 3.214)	1.354(0.651,2.817)
	<7	17(7.3%)	8(1.7%)	0.418	5.123(2.168,12.107)	0.920(0.299,2.826)
Gestational age	28-36wk	110(40.1%)	89(16.3%)		1	1
	37-42	115(42.0%)	374(68.4%)	0.046	0.249(0.176, 0.353)	0.507(0.261,0.987)*
	>42	49(17.9%)	84(15.4%)	0.032	0.472(0.301, 0.740)	0.387(0.162,0.923)*
Age	<20yr	21(7.7%)	76(14.1%)		1	1
	20-34yr	218(79.6)	429(79.4%)	0.775	1.839(1.104, 3.062)	0.623(0.081, 4.786)
	>=35	35(12.7%)	35(6.5%)	0.0.265	3.619(1.846, 7.094)	0.968(0.094, 9.996)
ANC	Yes	213(77.7%)	490(89.6%)		0.406(0.274, 0.603)	0.760(0.217,2.658)
	No	61(22.3%)	7(10.4%)		1	1
Mode of delivery	SVD	200(77.2%)	412(75.3%)		1	1
	Instrumental	5(1.9%)	28(5.1%)	0.823	0.368(0.140, 0.967)	1.184(0.269,5.209)
	CS	35(13.5%)	107(19.6%)	0.000	0.687(0.452, 1.043)	0.167(0.084,0.331)
Obstetric Complication	Yes	262(95.6%)	106(19.4%)	0.000	90.83(49.05,168.22)	178.941(70.052,457.09)*
	No	12(4.4%)	441(80.6%)		1	1
History of chronic illness	Yes	9(3.3%)	15(2.7%)	0.830	(0.348, 1.864)	0.668(0.122, 3.666)
	No	265(96.7%)	532(97.3%)		1	1
Partogaraph	Yes	91(33.2%)	455(83.2%)		1	1
	No	183(66.8%)	92(16.8%)	0.000	9.95(7.102, 13.93)	8.970; (4.801,16.759)*
Presentation	cephalic	247(90.1%)	524(95.8%)		1	1
	breech	14(5.1%)	19(3.5%)	0.588	1.563(0.771, 3.169)	1.387(0.425, 4.531)
	others	13(4.8%)	4(0.8%)	0.504	6.895(2.225, 21.361)	1.863(0.301, 11.540)

*shows significant association

DISCUSSION & CONCLUSION

The finding from this study revealed that history of obstetric complications, use of partograph; gestational age and mode of delivery were factors significantly associated with perinatal mortality.

Using partogaraph was associated with perinatal mortality in which 8.97 times higher among mother without partogaraph follow up compared to those who followed using partogaraph. This shows that partogaraph is significant tool decrease perinatal mortality. This is consistent with study in Addis Ababa & Uganda that showed use of partogaraph was protective factor for perinatal death by 65%[2,10]. Since partogaraph is labor follow-up chart recommended by WHO, appropriate use of partogaraph can help health professionals to pick any abnormalities during the course of labor. And best tool to help you detect whether labour is progressing normally or abnormally, and to warn as soon as possible if there are signs of fetal distress or if the mother's vital signs deviate from the normal range. Other research studies have shown that maternal and fetal complications due to prolonged labour were less common when the progress of labour was monitored by the birth attendant using a partogaraph[3]. Therefore, it can prevent perinatal loss that can be managed if early diagnosis is done. It also tells us the quality of intra partum care. This strengthens the recommendation consistent use of partogaraph for every delivery.

Perinatal mortality was higher among mothers with history of obstetric complications. This is consistent with studies done in AddisAbaba hospital that showed obstetric complication was strongly associated with

perinatal mortality with a case fatality rate of 73.5 %11. It was also consistent with a Study in Jimma & Democratic Republic of Congo that showed complications during labor & increased risk of obstetric complications were identified as determinants of perinatal mortality12,13. This might be due to in fact most mothers as in our country having obstetric complication visit health institution after long delays with developing events endangering newborn's life. This aware professionals & other concerned bodies on early identificationof complications seriously.

Based on the findings of this study, perinatal mortality were 0.507 times lesser among term newborns compared with preterm babies. This is true that prematurity one of the condition that expose newborns for a number of medical complications that rescues their life. This is similar with study done in Hawassa & Jimma indicating perinatal mortality was 3 times higher among preterm babies than term babies12. The finding also similar with study Democratic Republic of Congo & WHO multi-country study13,14. The association of preterm babies with perinatal mortality is mainly because of prematurity is one of the commonest causes of perinatal death is preterm birth and its complications. And low birth weight newborns had a risk for perinatal mortality than normal weight babies.

Another finding of this study, perinatal death were 0.167 times lesser among mothers who delivered by cesarean section than SVD. This result was contrary to expectations. This finding is supported by study in Addis Ababa that showed perinatal death were less likely among mothers who delivered by cesarean section than SVD2. The finding is not consistent with study in Zimbabwe that showed that normal SVD is a protective factor for perinatal death compared with instrumental delivery or cesarean section15. The association might be since this kind of delivery was commonly conducted might be selective cesarean sections which commonly end up with alive births or when there was an obstetric complication.

STRENGTH & LIMITATION

The type of study design used is strong to see an association of exposures towards the outcome variable and it is a better study design to look multiple exposures for perinatal mortality.

The main limitation of this study is it used secondary data as a source of information. Since this data was gathered for other purpose, it was difficult to gather all necessary variables like educational status, occupation, birth interval & residence which have association in literatures. The status of the live births that were discharged alive was unknown. Being a single hospital based study lacks of generalization to the community is another limitation to this study.

CONCLUSION

The study revealed that history of obstetric complications, use of partograph; gestational age and mode of delivery were factors associated with perinatal mortality.

From factors that are mentioned above, some of them can be prevented with early investigation of pregnant mothers up on their follow up to identify abnormalities and manage them accordingly. The other factor is poor quality of intra partum care, reflected by not using partograph for labor follow up which is one of the important determinant factors for perinatal loss.

RECOMMENDATION: We recommend supervision & support of health professionals on use of Partogaraph & identifying obstetric complication at the time of ANC follow up & delivery.

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REFERENCES

1. Yifru Berhan &Asres Berhan, systematic review done to assess the trend and causes of perinatal death in Ethiopia ,Ethiopia Journa OF health, 2014, volum 24,

2. The World Health Report, Make Every Mother and Child Count. World Health Organization, Geneva, 2005

3. Yemisrach Getiy , assessment of factors associated with perinatal mortality among public hospital deliveries in Addis Ababa, ethiopia, 2015

4. Office of national statistics. Childhood, Infant and Perinatal Mortality in England and Wales, 30 January 2014

5. WHO, Neonatal and Perinatal Mortality; Country, Regional and Global Estimates, 2006

6. Schmiegelow C, Minja D, Oesterholt M et al. factors associated with and causes of perinatal mortality in northeastern Tanzania. Pub med. 2012; 91(9): p. 1061-8.

7. Nakibuuka VK, Okong P, and Byaruhang RN. Perinatal death audits in a peri-urban hospital in Kampala, Uganda. Journal of Africa health science, 2012; 12(4): p. 435-442

8. Derek Osborn, Amy cutter fu. Universal sustainable understanding the Transformational Challenge for Developed Countries Report a study by stake holder forum. 2015

9. Mendes KG, Teresa M, Case-control study on infant mortality in Southern Brazil Estudo de caso-controlesobremortalidadeinfantilem Caxias do.2006;40(2):240–8

10. VK Nakibuuka, P Okong, and RN Byaruhang. Perinatal death audits in a peri-urban hospital in Kampala, Uganda. Journal of Africa health science, 2012; 12(4): p. 435-442

11. Lalisa Chewaka, preventable causes of neonatal mortality and associated factors among neonates admitted to neonatal intensive care units of Addis Ababa governmental hospitals from 2011 -2015 gc: a retrospective study,2016

12. Tachiweyika Emmanuel, Gombe Notion, Shambira Gerald1et al. Determinants of perinatalmortality in Marondera district, Mashonal and East Province of Zimbabwe, 2009. Pan AfricanMedical Journal, 2011. 8 (7).

13. Ntambue AM, D.P., Dramaix-Wilmet M. et.al. Risk factors for perinatal mortality in the city of Lubumbashi, Democratic Republic of Congo. Revue Epidemiologic et de santé publique, 2012; 60(3): p. 167-76..

14. Nhu Thi Nguyen Ngoc,a Mario Merialdi,b Hany Abdel-Aleem ,et al Causes of stillbirths and early neonatal deaths: data from 7993 pregnancies in six developing countries, 2008

15. Tachiweyika Emmanuel, Gombe Notion, Shambira Gerald1et al. Determinants of perinatalmortality in Marondera district, Mashonal and East Province of Zimbabwe, 2009. Pan AfricanMedical Journal, 2011. 8 (7).

EARLY POSTNATAL CARE SERVICE UTILIZATION AND ASSOCIATED FACTORS AMONG MOTHERS WHO GAVE BIRTH IN THE LAST ONE YEAR PRECEDING THE SURVEY IN SIDAMA ZONE MALGA DISTRICT, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND: Early Post-natal care service utilization is extremely low and stagnant over the decade of period in Ethiopia. Ethiopian Demographic and Health Survey 2016 reported that only 17% early post-natal care service utilization occurred despite the fact that, maternal mortality is high in the first 24 to 48 hours after delivery.

OBJECTIVE: The aim of this study was to assess early postnatal care service utilization and associated factors among mothers who gave birth in the last one year, in Sidama Zone Malga Woreda, Southern Ethiopia.

METHOD: A community based quantitative supplemented by a qualitative cross-sectional study was conducted from September 15, 2017 to October 15, 2017 in Sidama Zone, Malga district among 395 mothers who gave birth in the last one year. Mothers were selected by Simple random sampling technique. Quantitative data was collected by semi structured questionnaires and coded, cleaned, entered into EPI info version 3 and exported to SPSS version 20 for analysis. In binary logistic regression, variables with P value less than 0.25 were taken into multivariable logistic regression analysis and then, variables with p value < 0.05 at the final model were considered statistically significant predictors of the outcome variable. Qualitative data was collected by focus group discussions, and Individual In-depth interview and then thematic analysis were used to interpret the results.

RESULTS: In this study, 22.5% of mothers utilized early postnatal care. Women who had experience of early postnatal care utilization has two times (AOR: 2.11, 95% CI: 1.11, 4.00), those who delivered at health facility were four times, (AOR: 4.10, 95% CI : 1.76, 9.57), those mothers who decide by themselves about early post-natal care utilization nearly four times (AOR: 3.84, 95% CI: 1.88, 7.82) , mothers who traveled on foot for less than two hours were four times (AOR: 4.24, 95% CI: 1.82, 9.91), mother who had four antenatal care follow up were nearly four times (AOR: 3.94, 95% CI: 1.18, 13.23) and educated mothers were seven times (AOR: 7.04, 95% CI: 2.42, 20.49) more likely to utilize early postnatal care service than their counterparts.

CONCLUSION: The study revealed that, early postnatal care services in the district are low. Maternal education, place of delivery, decision making power of the mother, time taken to reach to health facility, antenatal care follow up, previous early postnatal care utilization and experience of the mother were independent predictors of early post-natal care service utilization. Therefore, Social and behavioral change communication strategies and continuum of community based care should have to strengthened.

KEY WORDS: Early Post-natal care, utilization, Barrier, Associated factor, Malga district

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BACKGROUND

Globally, four million new-born die in the neonatal period of time, that accounts 40-44% of under five-year age of deaths. About 1, 000, 000 of new born death and 46% of all maternal death occur within the first day of life. A large proportion, 515, 000 of maternal deaths and 75% of Newborns death occur during the first weeks of postnatal periods[1-3].

In Sub Saharan Africa, the maternal mortality ratio due to the condition related to pregnancy and child birth is unacceptably high over the decade. Ethiopia is one of the sub-Saharan countries with higher Maternal Mortality Ratio. Lancet series and state of the world children stated that, majority of maternal and new born death occurred during early postnatal period[1,4-6].

The United Inter-Agency Group for Child Mortality Estimation (UN-IGME 2014) indicated that, there is a further decline in under five mortality ratio (U5MR), Infant mortality ratio (IMR) and Neonatal mortality ratio (NMR). However, the proportion of newborn death is still high and Ethiopia is one of the eight high newborn mortality countries (together with Bangladesh, Malawi, Nepal, Liberia, United Republic of Tanzania, Timor – Leste, Niger and Eritrea)[11]. Federal Ministry of Health of Ethiopia dully recognized that, the current under-five and neonatal mortality rates of 64 and 29 per 1,000 live births, respectively, is unacceptably high and also acknowledged that, neonatal mortality rate is disproportionally high accounting for 44% of under-five deaths[8].

Both The Lancet series on Newborn and Maternal Health suggested that, 15 to 32% of neonatal deaths can be prevented through achieving high coverage of a few key practices through early post-natal care (The care that newborn and mothers received within the first 2 days following delivery) intervention. In other hand, blended module for health extension program stated that, early PNC service utilization could decline 10-27% of neonatal deaths. For this reason, community based new born care programs in Ethiopia recommended that,

mother and new born should receive early postnatal care services following delivery regardless of their birth place[1,9].

However, utilization of early postnatal care in developing countries in general and in Ethiopia in particular is very low. In the 2016 Ethiopian Demographic and Health Survey, it's reported that only 17% of women received early PNC within 48 hours[1,10]. Utilization of early post natal care can be prejudiced by cultural, demographic, social and Economic factors, and other barriers that need to dig out from community according to the local conditions[11].

It is said that, there are multiple associated factors, facilitators and barriers that affect early PNC service utilization[1,3-5,8]. Thus, identifying associated factors for early postnatal care will contribute on reduction of maternal and new born mortality, and strengthen the existing supply and birth surveillance mechanism, improve early PNC utilization by women of reproductive age and will help decision makers at all level to design for defending mechanism for associated factors and barriers.

Despite this importance, there is scarcity of studies that assessed utilization of early post natal care utilization and associated factors in the study area and also the previous published researches in Ethiopia at different regions were not focused on early PNC service utilization, rather focused on PNC service utilization in general. In addition, most studies conducted in the country were not focused on cultural factors than can hinder the utilization of early post natal care service. So, the main aim of this study was to assess early post natal care service utilization and associated factors among mothers who gave birth in the last one year in Malga district of Sidama zone, Southern Nations Nationalities and Peoples Region.

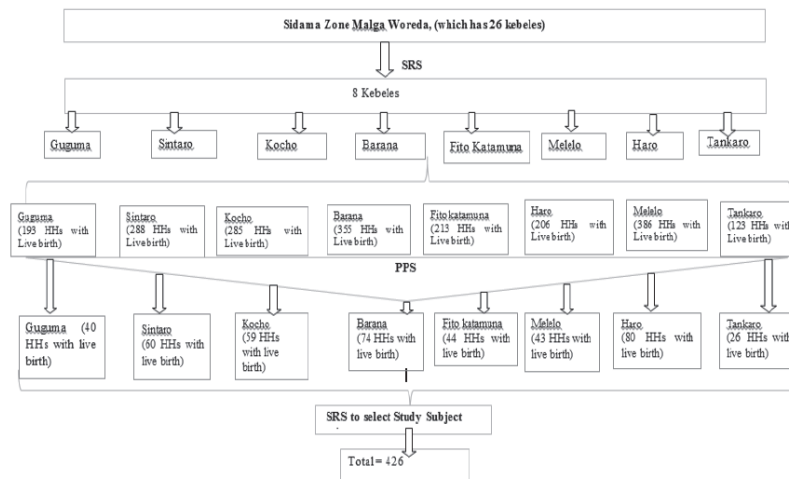## Zone, Southern Nations Nationalities and Peoples Region.

Figure 1: Sampling procedure of earlypost-natal care utilization in Sidama zone, malga woreda, 2017

METHODS

A community based quantitative cross sectional study design supplemented with qualitative study was conducted from September 15,2017 to October 15, 2017 in Malga district, Sidama zone, Southern Ethiopia among 426 women who gave birth in the last one year in the district. Malga district is found in SNNPR state Sidama Zone, and located 300 km far from the capital city, Addis Ababa and 27 km from Hawassa city of SNNPR. Based on the adjusted 2010 census estimation by the CSA, the total population of Malga Woreda is 142,536 of whom 69,996 are males and 72,561 are females. All mothers who gave birth in the previous one year in Malga district were source population and all mothers who gave birth in the last one year in selected kebeles of Malga district were the study population for this study. All mothers who gave birth in the last one year prior to data collection and who resided in malga woreda for at least 6 months were included in to the study and mothers who had a mental problem and/or critically ill during data collection were excluded from this study.

To get the required sample size, multistage sampling technique was used. First, 8 kebeles were selected by lottery method from 26 kebeles in Malga district. Then, census was conducted to identify number of households with study respondent and proportionally allocated for each selected kebele. Finally, lottery method was used to select the study sample (Figure 1).

For qualitative study, purposive sampling was used to select participants for FGDs. Two FGDs which comprise a total of 8-12 individuals with mothers, and father groups and 3 IDI, one with health professional and two with health extension workers were conducted. The number of the FGD and IDI was determined based on information saturation.

Data collection procedures and quality control

Quantitative data

Structured interviewer administered questionnaire, which was prepared in English and translated to Amharic was used for data collection. Data was collected by 8 trained data collectors and two supervisors supervised the data collection process.

Qualitative data

Qualitative data was collected by using FGD and IDI. FGD and IDI guide were prepared and implemented after reviewing relevant literatures. Two FGD were conducted with a total of 20 participants. Among these, 12 participants were from lactating mothers, and 8 from father's groups. The selected mothers for these FGDs had similar background with respondents, whereas fathers were husbands who currently living with eligible mothers for the study. In other hands 3 IDI were conducted with one health workers from health center and two health

extension workers from two different health posts. The number of FGD and IDI was determined based on the information saturation.

To control the quality of data, instruments were translated to local language, data collectors and supervisors were trained, questionnaire, FGD and IDI guides were pretested on respondents who were not included into the study to validate the instrument. Based on the findings of the pretest, necessary modifications were made. Data collection procedure was closely supervised and the collected data were checked for completeness, consistency and reliability.

Dependent variable for the study was utilization of Early Post-natal care. Independent variables were: Socio demographic factors including: age, marital status, gravidity, party and religion; Socio economic factors including: level of income, education, birth preparedness, planed pregnancy, media exposure and culture; Health care related factors including: status of ANC follow up, previous delivery history and access for health care, and attitude related factors including: thought, norms, perception, belief and practice

Measurements

Early post-natal care utilization: in this study, it refers to mother who have at least one postnatal visit within 48 hours following delivery.

Barriers for Early PNC: in this study, it refers to any thought, norms, perception, belief and practice that confine mother and new born from benefiting from early PNC.

Awareness: in this study, it refers to whether the mother or FGD participants mentioned at least one of the PNC services among the components

Data processing and analysis

Quantitative data

Data was entered using EPI-data version 3.1 and exported to SPSS version 20 for analysis. Descriptive statistics were computed. Presence of association between dependent and independent variables was assessed by using OR with 95% confidence intervals. Binary logistic regression analysis was conducted to identify the candidate variables for the final model and

then, all variables with p-value less than 0.25 at binary were taken into multivariable logistic regression to outline the independent predictors of early post-natal care utilization. Variables with P-value of <0.05 at final model were considered as an independent predictors of the outcome variable. Finally results were presented using text, tables and charts.

Qualitative data

The qualitative data responses were coded, categorized, and then organized by content with thematic analysis. Ideas in the text were merged with their themes and a thematic analysis was performed manually. Finally, the results were presented in narration by making triangulation with quantitative findings.

Ethical consideration

Ethical clearance was obtained from Arba Minch University, College of Medicine and Health Science Ethical Review Committee. A formal letter was written to different administrative bodies and organizations to obtain permission to conduct the research in the settings. Finally, verbal informed consent was obtained from all study participants before interview.

RESULTS

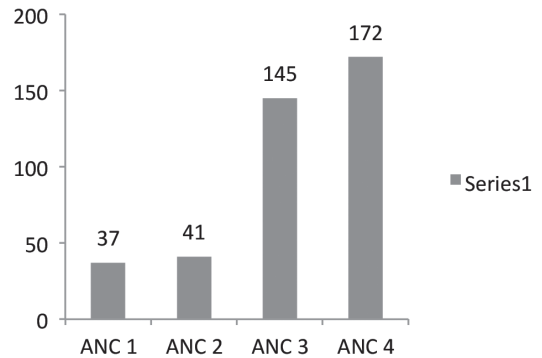**Socio Demographic and Socio Economic Characteristics of Respondents**

A total of 395 participants were interviewed making response rate of 92.7%. The mean age of study participants was 26.39 ± 5.82 standard deviation. Majority, 303 (76.7%) of the respondents were protestant, and Catholic followers account only 6 (1.5%). Majority 389 (98.5%) of the respondents were married, and unmarried accounts only 6 (1.5 %). Regarding place of residence 340 (86.1%) were rural and 55 (13.9 %) were urban residents. Majority, 209 (52.9 %) of the respondents were uneducated and secondary and above attended accounts only 52 (13.2%). Regarding maternal occupation, majority 272 (68.9 %) of the respondents were housewives and private employed accounts only 2 (0.5 %). Concerning husband Education, majority 238 (60.3 %) of the respondents were uneducated and Secondary and above attended accounts only 26 (6.6%).

Concerning average monthly income, majority 264 (67.6 %) of the respondents earned ≤ 500 birr and those who earned above 2500 birr accounts only for 23 (5.6%) (Table 1).

Table 1: Socio demographic characteristics of respondents, Malga district, Southern Ethiopia, 2017 (n=395).

Variable name and categories		Frequency	Percentage (%)
Age of the mother	15-19	47.0	11.9
	20-24	132.0	33.4
	25-29	87.0	22.0
	30-34	91.0	23.0
	35-40	38.0	9.6
Marital Status	Not Married	6.0	1.5
	Married	389.0	98.5
Religion	Orthodox	7.0	1.8
	Muslim	78.0	19.7
	Protestant	304.0	77.0
	Catholic	6.0	1.5
Place of residence	Urban	340.0	86.1
	Rural	55.0	13.9
Maternal Education	Uneducated	209.0	52.9
	Primary Education	134.0	33.9
	Secondary and above	52.0	13.2
Maternal Occupation	Unemployed/ House wife	272.0	68.9
	Self employed	117.0	29.6
	Government employed	4.0	1.0
	Private employed	2.0	0.5
Husband Education	Uneducated	238.0	60.3
	Primary Education	131.0	33.2
	Secondary and above	26.0	6.6
Husband Occupation	Unemployed /Farmer	222.0	56.2
	Self employed	158.0	40.0
	Government employed	11.0	2.8
	Private employed	4.0	1.0
Average monthly Income	≤ 500 birr	285.0	72.2
	501_1500 birr	63.0	15.9
	1501_2500 birr	25.0	6.3
	≥ 2500 birr	22.0	5.6

Maternal and Health care utilization related factors

Out of the total respondents, 37 (9%), 41 (10%), 145 (36.7%) and 175 (44.3%) of the respondents utilized ANC 1, ANC 2, ANC 3 and ANC 4 respectively (Fig.2).

Figure 2: Bar chart showing ANC follow up among respondents in Malga district, Southern Ethiopia 2017

Regarding place of delivery, 146 (36.96%) of respondents gave birth for their last child at health facility. About 170 (43%) of respondents have previous experience of EPNC service utilization. Regarding decision making about utilization of health services, only 91 (23%) of respondents have a power to decide to seek health services. About 180 (45.57%) of the respondents received health education about both antenatal care and postnatal care services and also 83 (21%) informed about importance of early postnatal care service utilization. In addition, 116 (29%) of respondents were knowledgeable about importance of early postnatal care service utilization. About 253 (64%) of the respondents have no transportation access to reach health facility and majority, 286 (72%) of the respondents travel more than or equal to 2 hours to reach health facility (Table 2).

Table 2: Maternal and health care service utilization related factors of the study respondents in Malga district, Southern Ethiopia 2017

Variable	Category	Frequency	Percentage
Place of delivery	Home	249	63.04
	Health facility	146	36.96
Experience of EPNC	Yes	170	43
	No	225	57
Decision making power	Mother	91	23
	Family members	304	77
Health education on ANC and PNC	Yes	180	45.57
	No	215	54.43
Information on EPNC	Yes	83	21
	No	312	79
Knowledgeable on EPNC	Yes	116	29
	No	279	71
Transportation access	Yes	142	36
	No	253	64
Time to travel to health facility	< 2 hours	109	28
	> 2 hours	286	72

Barriers to utilize early post-natal care services

The FG discussants were asked if they had awareness about EPNC. The mother group was mentioned that, they have awareness about EPNC and its benefits and all mothers had positive attitude towards PNC services. The benefits mentioned by them include; health checks, immunization service, contraception and counseling services. The father group FG discussants had no awareness about EPNC utilization rather; they focused on health center delivery.

Focus group discussant father responded that .... "We are not aware about EPNC follow up and our intention is about health center delivery. Due to mountainous topography, distance, inaccessible and poor ambulance services in our health center, most women couldn't access EPNC...." (38 years-old father, Guguma kebele). IDI with health care professional revealed that .... "Health care professionals give much emphasis on provision of information on immunization rather than EPNC".... "HEWs do not use family health guide to teach the mother and do not follow ORPA steps. Even though they use the family health guide, they might have knowledge gaps on use of materials properly. Mothers who live with Grandmother and father-in-law couldn't utilize health services, so that elder family members have a great role on mothers' care and they are resistant to change...." (26 years-old health professional, Guguma Health center).

The cultural practice, beliefs and norms were the main barriers that affect utilization of early post-natal care. The focus group discussant mothers responded that.... "Having any health care services even on a day to day base following delivery is very important, in practice it is very difficult due to the inherited practice we acquired. in Sidama culture it's not allowed for a delivered mother to go out until 40 days. The culture is locally called 'hashucho gira gesha', due to fear of evils sprit; mother have safety pin or locally called 'merfe kulf' on her close or holding knife even when going out for toilet. For this reason, mothers prefer to get post-natal care services after 40th day...." (28 years-old mother, Guguma kebele).

Another discussant mother added that... "I am a mother of four children and I have got immunization service from health center at 45 days after blessing my babies by church leaders. In our locality mothers first take her child for blessing by church leaders before going to anywhere after delivery...." (30 years- old mother, Guguma kebele). IDI with HEWs reveled that home delivery, delivery notification, accessibility, distance and work over load were important factors that can affect EPNC services utilization.

Interviewed HEW responded as.... "I have served for 7 years and provided EPNC in better way for mothers who delivered at health center and nearby health facility than those who delivered at home". She also added that... "Currently providing early PNC for mothers delivered at home is a tough work due to failure to notify by the family of postnatal women and when we go for PNC provision after we have informed through HDAs, some family members responded as she slept ......" In addition, she responded that... "HEWs under take16

packages and other additional tasks. Due to this case, we couldn't manage all post-natal care for the mothers early but we try our best and visit them any time...." (28 years-old health extension worker, Guguma kebele).

On another Kebele, interviewed HEW responded as.... "Family guidance association appointed women groups who worked closely on issue related to maternal health which promote our kebele's institutional delivery and facilitate EPNC utilization. Of course we couldn't have handled early all delivered mothers due to work over load, wide geographic coverage, lack of transport access and distance...." (26 years-old health extension workers, Sintaro kebele).

IDI with health extension workers about community side barriers revealed that.... "if mothers after delivery go back for health care services without any health problems; the community believe that she is mentally ill and questioned on her family. The conditions are very ashamed for mothers and her family" said by nodding the head...." (26 years-old health extension workers, Sintaro kebele).

Prevalence of early post-natal care utilization

The prevalence of early postnatal care service utilization in the study area is 89 (22.5%). Among these, 71 (17.97%) of participants had got within 24 hours following delivery, whereas 18 (4.55%) within 24 to 48 hours of postpartum period (Fig. 3).
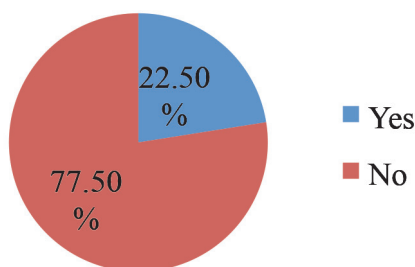
Multivariable logistic regression analysis showing factors associated with early post-natal care service utilization Maternal education, ANC follow up, Place of delivery, Time taken to reach health facilities, and decision making power of mothers were found to be statistically significant predictors of early postnatal care service utilization.

Mothers who have attended secondary and above level of education were seven times more likely to utilize early postnatal care service compared to uneducated mothers (AOR: 7.04, 95% CI: 2.42, 20.49). Similarly, mothers who had got four ANC follow up during their last pregnancy were nearly four times more likely to utilize early postnatal care service compared to those who had less number of ANC follow up (AOR= 3.94, 95% CI: 1.18, 13.23).

On other hand mothers who delivered at health facilities were four times more likely to utilize early postnatal care service (AOR: 4.07, 95% CI: 2.48, 6.68) compared to those who delivered at home. Mothers who had decision making power on utilization of health service were nearly four times more likely to utilize early postnatal care service compare to those who did not have decision making power (AOR = 3.84, 95% CI: 1.19, 7.82), mothers who had previous EPNC experience were 2.1 times more likely to utilize early postnatal care service compared to those who did not have the experience (AOR = 2.11, 95% CI: 1.11, 4.00)

Regarding the time taken to reach Health institution, mothers who travel for less than two hours to reach Health facilities were four times more likely to utilize early PNC service compared to those who traveled two or more hours (AOR= 4.24, 95% CI: 1.82, 9.91) (Table 3).

Figure 3: Prevalence of early post natal care service utilization among respondents in in Malga district, Southern Ethiopia 2017

Table 3: Multivariable Logistic Regression showing factors associated with Early PNC Service Utilization in Malga, district, Southern Ethiopia, 2017.

Variables	Categories	Early PNC Utilization		COR(95%CI)	AOR(95%CI)
		Yes	No		
Place of residence	Rural	72	268	1	1
	Urban	17	38	1.67 (0.89,3.12)	0.74 (0.28, 1.95)
Maternal Education	Uneducated	36	173	1	1
	Primary	20	114	0.84 (0.47, 1.53)	0.88 (0.38, 2.04)
	Secondary and above	33	19	8.35 (4.28, 16.29)	7.04 (2.42, 20.49)**
ANC follow up status	One times	5	32	1	1
	Two times	5	36	0.89 (0.24, 3.35)	0.75 (0.15, 3.76)
	Three times	8	137	0.37 (0.12, 1.22)	0.27 (0.07, 1.12)
	Four times	71	101	4.49 (1.67, 12.11)	3.94 (1.18, 13.23)**
Place of Delivery	Home	33	216	1	1
	Health Facility	56	90	4.82 (1.81, 12.86)	4.07 (2.48, 6.68)**
Previous EPNC service utilization Experience	No	39	186	1	1
	Yes	50	120	1.99 (1.23, 3.20)	2.11 (1.108, 4.00) **
Decision Making Power	Family members	45	259	1	1
	Mother	44	47	5.39 (3.21, 9.05)	3.84 (1.882, 7.82)**
Health Education about ANC and PNC	No	41	174	1	1
	Yes	48	132	1.54 (0.96, 2.48)	0.58 (0.27, 1.24)
Information about EPNC	No	53	259	1	1
	Yes	36	47	3.74 (2.21, 6.33)	2.31 (0.87,6.16)
Knowledgeable on EPNC Services	No	52	227	1	1
	Yes	37	79	2.05 (1.25, 3.35)	1.19 (0.57, 2.49)
Time taken to reach health facility	> 2hrs	20	89	1	1
	< 2hrs	69	217	1.42 (0.81, 2.47)	4.24 (1.82, 9.91)**
Transport Accesses	No	35	218	1	1
	Yes	54	88	3.82 (2.34, 6.25)	0.36 (0.11, 1.23)

(Note: ** = Statistically significant association at p-value of <0.05).

DISCUSSION

This study revealed that early postnatal care service utilization is 22.5 %. This is slightly higher than the study conducted in Pradesh, India (19%)[12] and Ethiopian demographic and health survey, 2016 (17%) (1). This difference might be attributed to the time gap between the studies, socio-demographic differences and health service accessibility. The current study finding is lower when compared with the study findings study conducted in Debre Markos town of Amhara region (33.5%)[13] and study conducted in Nepal (40.9%)[14]. This difference might be attributed to the difference in approaches of implementing Early PNC service provision along with the difference in socio-economic status, geographical barriers, accessibility of services,

information and health education between countries. In other hands, the current study result is similar with the study conducted at Arsi Zone, Aseko district (21.4%)15 and study conducted Amhara region, in Jabitena district (20.2%)16.

This study revealed that Maternal education, Place of delivery, decision making power of the mother, time taken to reach health facility, ANC follow up and previous early postnatal care utilization experience of the mother are an independent predictors of early PNC service utilization.

Those mothers who attended secondary and above level of education were seven times more likely to utilize Early PNC service compared to uneducated mothers, which is consistent with study conducted in Amhara region Jabitena district16, EDHS, 2016 report1, study conducted in Dembecha district of Amhara region17, study conducted in Pradesh, India12 and study conducted in Nepal14. This is due to the fact that, educated women can get adequate information about maternal health services including importance of early postnatal care by reading different books, pamphlets, leaflets and other. In addition, educated women are economically better than uneducated women that help them to access Medias like radio and television.

In this study, place of delivery was one of the predictors of the outcome variable. Mothers who gave birth at health facility were four times more likely to utilize early PNC service than those who delivered at home. This finding is consistent with the study conducted in Aseko district of Arsi zone15, study conducted in Jabitena district of Amara region16, study conducted in Debre Markos of Amhara region13, EDHS, 2016 report1, study conducted in Rwanda18, study conducted in Nepal14 and Study in Pradesh, India12. The possible explanation for this association can be attributed to the fact that, women who gave birth at health institution have greater opportunity for health education related to early postnatal care services immediately after delivery and thus get access to learn about importance of early postnatal care, complications during postnatal

period and importance of postnatal care not only for themselves, but also for their newborn.

IDI with health extension workers support the association between early postnatal care service utilization and place of delivery as …. "I have served for 7 years and provided early PNC in better way for mothers who delivered at health center and nearby health facility than those who delivered at home". … "currently providing early PNC for mothers delivered at home is a tough work due to failure to notify by the family, when postnatal women are available and when we go for PNC provision after we have informed through HDAs, some family members respond that she slept, and also…. HEW under take16 packages and other additional tasks. Due to this case, we couldn't provide early postnatal care for all post-natal women……" (28 years-old health extension worker, Guguma kebele)

In this study, women who had decision making power on utilization of health care services had nearly four times more likely to utilize early postnatal care service compared to those whose decision making power was vested with other family members. This finding is consistent with a study conducted in Oromia region Arsi Zone Aseko district15, study conducted in Gonder Zuria district19, study conducted in Rwanda18 and study conducted in Amara region Jabitena district16. This association may be due to the fact that, women who can decide by themselves about their health services can get health services at any time, make necessary preparation to seek health service and also may have an awareness about complications during postnatal period than those for whom decision to seek health service is made by other family members.

The above association was supported by the finding of IDI with health care professional stated that …. Family member play a key role in allowing early PNC care service utilization. Especially those families who live with Grandmother and grandfather couldn't utilize health services including postnatal care, because, those mothers cannot allowed to seek health services, unless permitted by their grandmothers and grandfathers. So, elder family members have a great role on mothers'

health care seeking and even if information is given for them, they are resistant to change...." (26 years-old health professional, Guguma Health center). This result was supported by qualitative study conducted in Ethiopia20 and FMoH blended module for Health extension workers[11].

Regarding the time taken to arrive at health facility, Mothers who travel on foot for less than two hours were four times more likely to utilize EPNC compared to those who traveled for greater than or equal to two hours, which is consistent with study conducted in Gonder Zuria district of Amhara region19, Dembecha district of Amhara region17 and study conducted in Aseko district of Arsi zone15. This may be due to the fact that, being closer to health facility can help mothers to access health information and reduces transportation costs that can help them to utilize the service.

The association between time taken to reach health facility and early postnatal care service utilization was also supported by FGD results of father group that responded as .... "we are not aware about EPNC follow up and our intention are about health center delivery even which cannot be utilized by women in most cases due to mountainous topography, distance, inaccessibility and poor ambulance services in our health center...." (38 years-old father, Guguma kebele). This result was supported by study done in Gonder Zuria19 and FMoH blended module for Health extension workers[11].

In this Study mothers who had four Ante natal care follow up were nearly four times more likely to utilize early postnatal care service compared to those with no ANC follow up, which is consistent with the findings of study conducted in Gonder Zuria19, EDHS, 2016 report1 and study conducted in Nepal14. This may be attributed to the fact that, women who utilized Antenatal care four or more times have an opportunity to get health information about importance of institutional delivery and early postnatal care service utilization. In addition they can also get information about complications of post natal period and the importance of seeking health service as early as possible.

Regarding community perception, community has poor perception towards early postnatal care at health center if mother go back for the service. Results of IDI with health extension workers reveals that,.... "after delivery, if mothers go back for health care services/checkup without any health problems; the community believe that she is mentally ill and questioned on her family and give them a little respect. As a result, the conditions are culturally very ashamed for mothers and her family" said by nodding her head...." (26 years-old health extension workers). Culturally in most parts of rural Ethiopia, the period before the umbilical cord stump falls off is understood to be a period when the baby is particularly vulnerable to harm by jealous or malevolent people and spirits, and the baby is usually secluded inside (20). This finding can also be supported by many studies conducted in Ethiopia and other developing countries [21-24].

STRENGTH AND LIMITATION OF THE STUDY
Strength of the study
The study was conducted using mixed method, in which the quantitative supplemented by qualitative that helps to dig out the deep insights of the community at large.

LIMITATION OF THE STUDY
Cross sectional nature of the study makes it difficult to establish cause effect relationship.

CONCLUSION AND RECOMMENDATION
The study revealed that, 22.5% of study mothers utilized early postnatal care services in the district. Maternal education, Place of delivery, decision making power of the mother, time to travel to health facility, ANC follow up and previous early postnatal care service utilization were independent predictors of early Post-natal care. Qualitative part of study revealed that Sidama cultural practice, beliefs of blessing child by church leader, community perception toward EPNC visit on mother come back to HC, HEWs work over load, quality of health care provision and delivery notification were barrier for Early PNC service utilization.

The respective responsible bodies should address the following recommendations to enhance early post-natal care service utilization in the study area:

➢ **For district health office**

The district health office should give much emphasis to address independent predictors that influence the utilization of early Post-natal care services like; maternal education, place of delivery, decision making power of the mother, transportation access, ANC follow up of the mothers.

➢ **For district education office**

Women empowerments through continues education program need to be strengthened since educated mothers more utilize early post natal care and other maternal health services.

➢ **For health workers and HEWs**

The health care workers should have to give much emphases on strengthen ANC follow up, Institutional delivery, enhancing mother's decision making power ,and reducing distance related factors through delivering Community based care services.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest regarding publication of the manuscript.

AUTHORS' CONTRIBUTION

GK and GG: Involved in generating the concept of this research paper, proposal writing, designing, analysis, write-up, preparation of scientific paper, and manuscript preparation; MK: Involved in approval of the final manuscript; AT: supported in proposal writing, designing, analysis, and approval of the final manuscript. All authors read and approved the final manuscript.

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REFERENCES

1. EDHIS. Key Indicators Report Central Statistical Agency Addis Ababa, Ethiopia The DHS Program ICF Rockville, Maryland, USA. 2016:201-45.

2. Series L. Every Newborn; Neonatal Survival Series. 2014.

3. Joy E Lawn SC, Jelka Zupan, for the Lancet Neonatal Survival Steering Team. Neonatal Survival 4 million neonatal deaths: When? Where? Why? 2005;Vol 365

4. WHO U, UNFPA and Worlid bank Estimate. Trends on Maternal Mortality 1990-2010. 2010:1.

5. Joy E Lawn SC, Zulfiqar A Bhutta, Gary L Darmstadt, Jose Martines, Vinod Paul, Rudolf Knippenberg, Helga Fogstadt, Priya Shetty, Richard Horton. Why are 4 million newborn babies dying each year? wwwthelancetcom March, 2005. 2005.

6. Fund UNP. The state of the world children 2009. 3 United Nations Plaza New York, NY 10017, USA 2008. p. 55-60.

7. Levels_and_Trends_in_Child_Mortality_2014.pdf.

8. Health Fhdfmo. National Strategy for Child Survival, Ethiopia; Adis Aeba. 2005.

9. CBNC Implementation plan -FMOH finalized March 26 2013-1 (6).

10. WHO. World health recomandations on Postnatal care of the mother and newborn. World Health Organization 2014. 2013.

11. Health FDRoEMo. Postnatal Care Blended Learning Module for the Health Extension Programme.114-15-20.

12. Sharma A, Thakur P, Kasar P, Tiwari R, Sharma R. Utilization of post natal care in tribal area of Madhya Pradesh, India: A community based cross-sectional study. International Journal of Medical Science and Public Health2014;3(10):1266.

13. Miteku L., Zerfu E., Berihun D. Postnatal care service utilization and associated factors among women who gave birth in the last 12 months prior to the study in Debre Markos town, northwest Ethiopia: a community based cross-sectional study. International journal of Reproductive medicine, volume 2016, 7 pages: http//dx.doi.org/10.1155/2016/7095352.

14. Sulochana Dhakal*1 GNC, Padam P Simkhada1, Edwin R van Teijlingen1, Jane Stephens2 and Amalraj E Raja1. Utilisation of postnatal care among rural women in Nepal. 2007.

15. An T, D N, A T. Early Postnatal Care Service Utilization and Associated Factors among Mothers Who Gave Birth in the Last 12 Months in Aseko District, Arsi Zone, South East Ethiopia in 2016. Journal of Women's Health Care2017;06 (01).

16. Yinager Gebeyehu Workineh DAH. Factors Affecting Utilization of Postnatal Care Service in Amhara Region, Jabitena District, Ethiopia. Science Journal of Public Health 52014;Vol. 2, No. 3, 2014, pp. 169-176. doi: 10.11648/j.sjph.20140203.15.

17. Mulatu Ayana Hordofa, Samirawit Shiferaw Almaw, Molla Gedefaw Berhanu, Habte Bolka Lemiso. Post natal care service utilization and associated factors among women in Dembecha District, Northwest Ethiopia. Science Journal of Public Health. Vol.3 No. 5 2015, pp. 686-692. Doi:10.11648/j.sjph.20150305.24.

18. Rwabufigiri BN, Mukamurigo J, Thomson DR, Hedt-Gautier BL, Semasaka JP. Factors associated with postnatal care utilisation in Rwanda: A secondary analysis of 2010 Demographic and Health Survey data. BMC pregnancy and childbirth2016 May 31; 16(1):122.

19. Tesfahun F, Worku W, Mazengiya F, Kifle M. Knowledge, perception and utilization of postnatal care of mothers in Gondar Zuria District, Ethiopia: a cross-sectional study. Matern Child Health J2014 Dec; 18 (10):2341-51.

20. Charlotte Warren PD, Lalla Toure, Pyande Mongi. Care seeking for maternal health: challenges remain for poor women. Ethiopian health journal of development: 2010; 24 Special Issue 1:100-104. 2010.

21. MCHIP. Cultural Barriers to Seeking Maternal Health Care in Ethiopia: A Review of the Literature. 2012.

22. Regassa N Institute of Environment GaD, Hawassa Univerity, Hawassa, SNNPR, Ethiopia. Antenatal and postnatal care service utilization in southern Ethiopia: a population-based study. African Health Sciences 2011;Vol 11 No 3.

23. Hannah Gibson AG. MCHIP Count brief Ethiopia End-of-Project Report. 2014.

24. Jessica N. DiBari SMY, Shin M: . Use of Postpartum Care: Predictors and Barriers Hindawi Publishing Corporation. Journal of Pregnancy. 2014;2014, Article ID 530769,: 8 pages.

MIGRATION OF A TCU380A INTRAUTERINE DEVICE INTO THE ABDOMINAL CAVITY AFTER INSERTION: A RARE ENTITY

Habib Mohammed Ahmed, MD[1], Woubishet Girma Teka, MD[2]

ABSTRACT

Intrauterine device (IUD) is most frequently used long acting reversible contraception.

Uterine perforation is a serious problem which can happen after intrauterine device (IUD) insertion. Migration of the IUD to the pelvic and abdominal cavity or adjacent organs may be seen following perforation of the uterus. Migration of an IUD to a far intra-abdominal site is extremely rare.

Severe or unrelenting pelvic pain, active vaginal bleeding and unusually short string during or after IUD insertion suggest uterine perforation with migrating IUD into abdominal cavity. Ultrasound and X-ray can be used to locate the migrating IUD.

The patient reported here had undergone IUD placement seven months back at local Health center three months after delivery. Since the time of insertion she has lower abdominal pain. Because of its rarity, this case report may help in suspecting, diagnosing, approaching and management of patients' with migrating IUD after uterine perforation.

KEY WORDS: Missed/migrating IUD, uterine perforation

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INTRODUCTION

Intrauterine device (IUD) is most frequently used as long acting reversible contraception. Copper IUDs primarily work by disrupting sperm motility and damaging sperm so that they are prevented from joining with an egg. Copper acts as a spermicide within the uterus, increasing levels of copper ions, prostaglandins, and white blood cells within the uterine and tubal fluids. The increased copper ions in the cervical mucus inhibit the sperm's motility and viability, preventing sperm from traveling through the cervical mucus, or destroying it as it passes through[1,2,3]

Uterine perforation due to an IUD is seen in 1 case out of 1,000 IUD placements. Uterine perforation following IUD insertion may be observed during or soon after the procedure or as a delayed event. Delayed perforation can happen due to uterine spasms. Although significant illness or injury related to intraabdominal IUD location is rare serious complications have been reported. Insertion of IUD by less experienced gynecologic care providers, lactation, and postpartum insertion are associated with perforation[4].

Severe or unrelenting pelvic pain, active vaginal bleeding and unusually short string during or after IUD insertion suggest uterine perforation with migrating IUD into abdominal cavity. Following the uterine perforation, an IUD may potentially migrate to the pelvic or intra-abdominal cavity causing several complications. There are not many reports on the far-migration of an IUD[4,5].

Minimally invasive techniques, such as hysteroscopy and laparoscopy, are ideally suited to the diagnosis and surgical management of the perforated IUD. Ultrasounds and X-ray can be used to locate where IUD is located. Immediate laparotomy is required if laparoscopic or hysteroscopy removal is difficult, if perforation of intraabdominal organs is suspected or with ongoing intraperitoneal hemorrhage[6,7].

To the best of our knowledge there were rare reported cases of uterine perforation with migrating or missed IUD. Therefore this case report will help care providers and researchers to be familiar with patient's clinical presentation, investigation and management of migrating IUD after uterine perforation.

CASE PRESENTATION

A 23-yearold Para-III (all alive) mother gave birth vaginally seven months back at a health center, presented with right lower abdominal pain of four months duration following IUCD insertion three months after delivery by a nurse. Following insertion she was having persistent lower abdominal pain for which she repeatedly visited the health center. She felt the IUCD string only for one week after which she could not feel it nor has she seen it being expelled. The patient was not having vaginal bleeding following insertion. Finally she was referred to Jimma University Medical Center, south west Ethiopia, with a diagnosis of lost IUCD. She is exclusively breast feeding and still amenorrhic and has no symptoms of pregnancy.

On examination, her vital signs were within normal ranges and conjunctiva was pink. On pelvic examination the cervix is closed and the string is not visible on speculum examination but there was right adnexal tenderness on bimanual examination with normal sized uterus.

Ultrasound was done showing an empty uterus and IUCD on the right adnexa just over uterus (Fig.1). Abdominopelvic X-ray was also taken by radiologist suggestion with uterine sound insitu showing a T-shaped Cu-IUCD on the right side of the pelvis and uterine sound in the uterine cavity. The sound was used to delinate the uterine cavity to identify whether the IUD is found in close proximity or far away from the sound (Fig.2). With the impression of migrating IUCD into pelvic cavity the patient was prepared for laparotomy. After abdomen was entered through pfannensteil incision there was Cu-IUCD attached to cornu and with stem partially in uterus and no bleeding (Fig.3). The IUCD was removed after serosa was dissected and hemostasis secured without any complication. The size of uterine perforation, at right uterine cornu between tube and round ligament, was a small one and there was no need of repair except approximation of overlying

serosa. The patient was counseled on contraception options and chose DEPOT Provera to take at the local health center and discharged improved on the 3rd post op day.
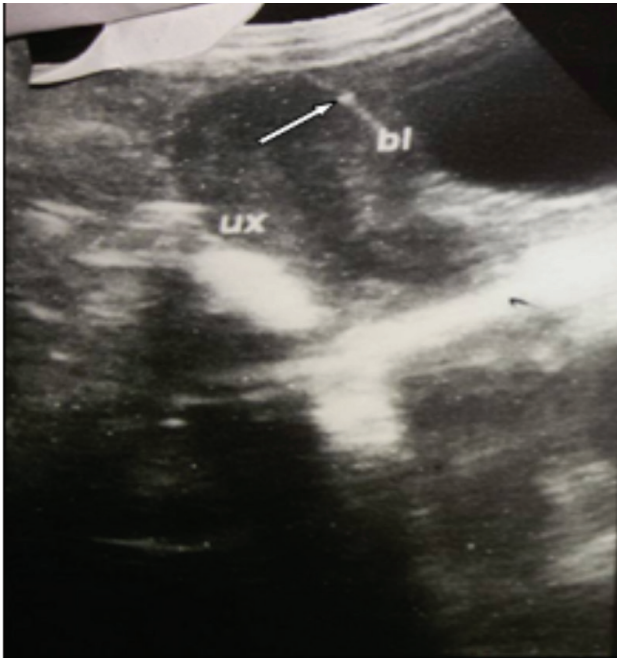

Figure 1: Abdominal ultrasound showing Cu-IUCD seen outside uterine cavity with cross section view (an arrow) at Jimma University   Medical Center (JUMC), Southwest Ethiopia, 2018

Figure 2: Showing Cu-IUCD on the right side (a white arrow) with Uterine Sound insitu (a black arrow) at Jimma University Medical Center (JUMC), Southwest Ethiopia, 2018
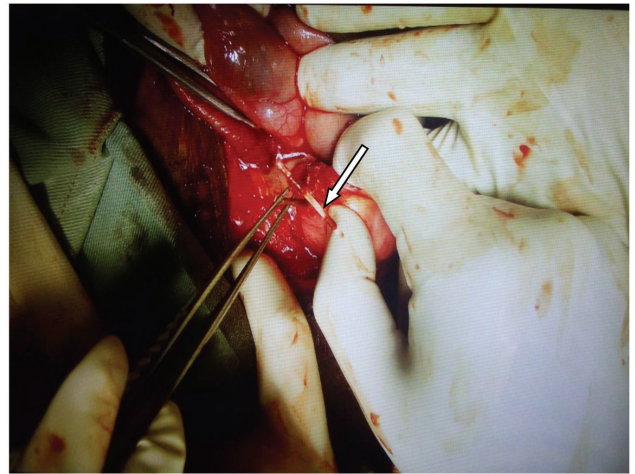

Figure 3: Showing Cu-IUCD after laparotomy (an arrow), on the right side of the uterus near the cornu, at JUMC, Southwest Ethiopia, 2018

DISCUSSION

The IUD is a long-term, reversible, effective and safe method of contraception. Used by about 100 million women, it is now the most widespread reversible contraceptive method in the world[1].

Uterine perforation after IUD insertion is a rare accident; its incidence varies in the literature, 1 to 3/1000. The perforation can occur in two ways: immediately during insertion, following a technical failure of IUCD insertion. It may be secondary to a partial myometrial perforation during insertion. Intramyometrial migration begins with embedment of the IUD into the myometrium; inflammatory phenomena and uterine contractions will allow the IUD to continue its migration. This inflammatory reaction leads to a significant accumulation of enzymes and of lytic/liposomal substances causing endometrial destruction and secondary migration of the IUD under the action of uterine contractions[8].

Certain factors predispose to uterine perforation and IUD migration: weakening of the myometrium by multiple pregnancies and cesarean scars; abnormal position, or size of the uterus; breastfeeding probably due to excessive uterine involution and endometrial atrophy as the consequence of lactation-induced

hypoestrogenism. Topographically, IUDs generally migrate into the peritoneal cavity (omentum, broad ligament, retropubic space), more rarely within an organ (ovary, rectum, sigmoid colon, appendix, bladder), or exceptionally intravascular (stenosis of the iliac vein), sometimes in the subcutaneous fat[9,10].

In case of ectopic IUD, pelvic examination is often not very successful in diagnosing IUD migration and in about 90% of cases, perforation is not recognized at the time of IUD insertion. The symptoms can be reduced to the immediate pain caused by improper insertion of the device revealing iatrogenic perforation. Very often, uterine perforation by the IUD remains asymptomatic; the diagnosis is suspected in the absence of visualization of the retrieval strings at vagina level and can be diagnosed with ultrasound or x-ray[11].

Sometimes the puncturing is only detected at the stage of complications such as pelvic abscess, organ perforation like the bladder or digestive segment. Death as the result of digestive complication has been reported in the literature. The clinical diagnosis is not always easy, additional explorations are required to locate the intrauterine device. Pelvic ultrasound by transabdominal and transvaginal route is the first line examination in the event of doubt[11,12].

Up to 15% of uterine perforations caused by IUDs affect adjacent pelvic and abdominal viscera, with the intestines most often involved. Intestinal complications arising from an ectopically placed IUD include perforation and obstruction of the large and small bowel, mesenteric penetration, bowel infarction, rectal strictures, and rectouterine fistula. There was a report on a case of ileal penetration 4 weeks after uterine perforation with a copper containing IUD[12,13].

CONCLUSION

Uterine perforation is a serious problem which can happen after intrauterine device (IUD) insertion leading to a rare event, migration of the IUD to the pelvic and abdominal cavity or adjacent organs may be seen following perforation of the uterus. The health care providers have to obtain adequate level of knowledge and skill in counseling and insertion of IUCD.Post insertion the client should be appointed to come at one month to see if thread is in place. However, in our case, the client was not advised to come back and even her problem was not detected and not referred timely despite she visited the health center for her complaint. Severe or unrelenting pelvic pain, active vaginal bleeding and unusually short string during or after IUD insertion suggest uterine perforation with migrating IUD into abdominal cavity. Following the uterine perforation, an IUD may potentially migrate to the pelvic or intra-abdominal cavity causing several complications. Hysteroscopy and advanced laparoscopy are ideally suited to the diagnosis and surgical management of the perforated IUD.Ultrasounds or X-ray can be used to locate where IUD is located. Exploratory laparatomy is required if difficult with laparoscopy or if perforation of intraabdominal organs is suspected. For our patient laparotomy was done and IUCD was removed after its migration was confirmed by ultrasound as laparoscopy is not yet the practice in our set up.

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REFERENCES

1. Treiman K, Liskin L, Kols A, Rinehart W (1995), "IUDs – an update", Popul Rep B (6): 1–35, PMID 8724322, retrieved 2006-01-01.

2. Grimes, D.A., MD (2007). Hatcher, R.A.; Nelson, T.J.; Guest, F.; Kowal, D., eds. "Intrauterine Devices (IUDs)". Contraceptive Technology (19th edition). New York: Ardent Media.

3. Oritz ME, Croxatto HB (2007). "Copper-T intrauterine device and levonorgestrel intrauterine system: biological bases of their mechanism of action". Contraception. 75 (6 Suppl): S16–S30.

4. Heinemann K,Westhof CL,Grimes DA,Moehner S"Intrauterine devices and the risk of uterine perforations:final results from EURAS-IUD study(abrstract).Obstet Gynecol 2014;123(suppl):3S

5. Sun CC, Chang CC, Yu MH. Far-migrated intra-abdominal intrauterine device with abdominal pain. Taiwan J Obstet Gynecol. 2008; 47:244.

6. Ech-Cherif El Kettani N, Dafiri R. Migration of intra uterine devises: role of imaging. Feuillets de Radiologie. 2007; 47(3):159-66.

7. Chi E, Rosenfeld D, Sokol T. Laparoscopic removal of an intrauterine device perforating the sigmoid colon: a case report and review of the literature. Am Surg 2005; 71:1055e7.

8. Goldstuck ND,Wildemeersch D.Role of intrauterine force in intrauterine device placement,perforation and migration.Int JWomen's Health.2014;6:735-744

9. Kaliskan E.Ozturk N,Dilbaz BO,Dilbaz S. A nalysis of risk factors associated with uterine perforation by intrauterine devices.Eur J Contracept Reprod Health Care. 2003;8:150-155..

10. Nceboz US, Ozcakir HT, Uyar Y, Caglar H. Migration of an intrauterine contraceptive device to the sigmoid colon:A case report. Eur J Contracept Reprod Health Care2003;8(4):229–32.

11. Ledger WJ,Wilson R. Intrauterine contraceptive devices:the recognition and management of uterine perforations.Obstet Gynecol.1966;28:806-811.

12. Chen C-P, Hsu T-C, Wang W. Ileal penetration by a Multiload-Cu 375 intrauterine contraceptive device. A case report with review of the literature. Contraception. 1998; 58:295–304 [PubMed].

13. Bergin A, Tristan S, Terplan M, et al. A missed opportunity for care: two-visit IUD insertion protocols inhibit placement. Contraception 2012; 86:694.

CASE REPORT ON TUBERCULOSIS OF CERVIX: RARE ENTITY

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ABSTRACT

This is the case report of a rare form of genital TB, cervical tuberculosis, which accounts for only 5-15 % of genitourinary tuberculosis (GUTB). Although pulmonary tuberculosis remains the commonest and the most infectious type of tuberculosis, extra pulmonary tuberculosis is becoming more prevalent in reproductive age women of developing countries. We report a case of 24 years old married nullparous lady presented with vaginal discharge and mild lower abdominal pain despite repeated treatment with antibiotics. She became amenorrhea and failed to conceive for the last 5 years despite regular, unprotected sexual activity. She visited different health facilities before her referral to Jimma University Medical Centre where genital tuberculosis was confirmed histologically by the presence of caseous necrosis and epithloid granuloma on cervical biopsy

KEYWORDS: Cervical tuberculosis, amenorrhea, infertility

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INTRODUCTION

The usual incidence of cervical involvement in genital TB is 5–15% 1. In women with genital TB, four major presenting complaints are described with varying frequencies: infertility, abnormal bleeding, pelvic pain, and amenorrhea2. As with other parts of the female genital tract; there are no macroscopic changes in the cervix that are specific for TB. The cervix may appear normal or inflamed, and its condition may resemble invasive carcinoma, both grossly and with the colposcope. The most common type is the ulcerative form, although papillomatous and miliary forms may also occur2.

Histopathologic examination reveals granulomatous inflammation and sometimes marked inflammatory atypia along with frequent hyperplastic mucosal changes. Caseation may be seen. Endocervical involvement is common and usually results in an increased secretion of mucin. The actual incidence of genital TB cannot be determined accurately in any population because it is estimated that at least 11% of patients are asymptomatic and the disease is discovered incidentally. Incidence varies greatly according to socioeconomic and public health conditions; it usually parallels the incidence of pulmonary and abdominal TB2. Female genital TB is rare in western world but relevant in developing countries and is associated with significant morbidity in the form of menstrual dysfunction, tubal block, peritubal adhesions, intrauterine adhesions, and perihepatic adhesions. It is mostly acquired by hematogenous route and always occurs secondary to pulmonary (commonest) or extra pulmonary tuberculosis such as gastrointestinal tract, kidneys, skeletal system, meninges and miliary tuberculosis[3].

TB can cause infertility, but usually it does not show any kind of symptoms until the infection has advanced to a severe level affecting the fertility in women by total destruction of the endometrium with resulting amenorrhea secondary to end-organ failure4. The tuberculous process generally is localized to the endometrium, is most extensive in the fundus, and decreases toward the cervix[2].

Systemic symptoms tend to be relatively mild, if present, and may include weight loss, fatigue, and a tendency toward a persistent mild evening elevation of temperature[5,6].

CASE REPORT

Twenty four years old nulliparous married lady presented to our hospital with a complaint of whitish vaginal discharge, mild lower abdominal pain of 3 years and was taking unspecified medication at different times from different health facilities with no improvement.

She also gave history of failure to menstruate for the last 5 years. Her menses was becoming minimal three years before it totally stopped. She had history of failure to conceive for the last 5 years despite regular unprotected sexual activity. She has history of use of one dose of injectable contractive 6 years back. Otherwise she has no history of significant weight loss, chronic cough, anorexia, undue fatigue, fever, postcoital bleeding, dyspareunia, and previous history of treatment for tuberculosis (TB), no urinary leakage.

On examination, she was well looking , all vital signs were within normal range, BMI was19.6kg/m2 ,no abnormal chest finding, no abdominal or pelvic mass .She had mild tenderness over lower part of abdomen up on deep palpation. Digital pelvic examination and bimanual examination were non revealing other than minimal, odorless whitish discharge.

Blood group and Rh A+, hemoglobin 13gm/dl, RBS 98 gm/dl, U/A: normal, VDRL: negative, chest x ray: normal, no abdominal or pelvic mass, US: normal size of uterus. Endocervical curettage was taken and revealed hyperplasic glands with intense chronic inflammation, focal area of caseous necrosis and epitheloid granuloma consistent with genitourinary TB affecting cervix (figure 1).

She was put on antitubercular treatment for six months, and then biopsy was taken from endo cervix which revealed no evidence of tuberculosis.The vaginal discharge subsided, and lower abdominal pain improved, but menstruation did not resume.
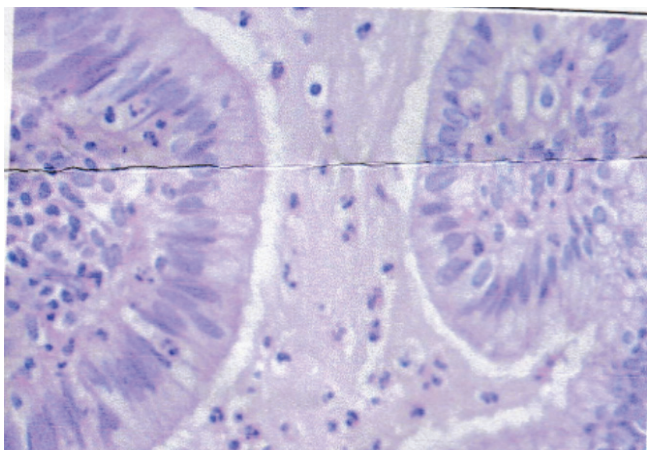
Fig1:- Pathology result shows hyperplasic endocervical glands with intense chronic inflammation with focal area of caseous necrosis and epitheloid granuloma

DISCUSSION

TB is a bacterial infection frequently seen in less developed countries. It is a frequent cause of chronic pelvic inflammation and infertility. While lung and lymph node localization are common, genital organ involvement is rare. TB involvement in the female genital tract in almost all cases is secondary to extragenital tuberculosis. The fallopian tubes are affected most commonly (90%), followed by the endometrium (50%) and the ovaries (10-30%). The cervix is rarely involved and accounts for 5-24% of the cases of genital tract[7].

The route of contamination can be direct, by inoculation of the bacillus to the cervix,

thus constituting the primitive form of this location. This form could be transmitted by a partner suffering from epididymal or urogenital tuberculosis. Usually it is secondary to lymphatic dissemination or contiguity from genital tuberculosis, itself secondary to hematogenous spread from a pulmonary localization[7]. The diagnosis of genital tuberculosis is usually made in a woman of reproductive age. However it can occur at any age, from pre-puberty to menopause. In the young girl in pre-pubertal period, TB is responsible for adhesions with primary amenorrhea, difficult to cure. In postmenopausal period, tuberculosis of the uterine cervix is a real diagnostic problem with the cervical cancer or endometrial cancer[9].

Fertility is generally poor even after treatment, owing to endometrial and tubal involvement at presentation and subsequent healing by fibrosis[10].

The diagnosis of TB is based on the identification of M. tuberculosis. Biopsy is a frequent first diagnostic step, and although its sensitivity suffers from sampling errors, it can be very helpful if granulomata are found or, less commonly, if smears or cultures are positive for M. tuberculosis[11].

The treatment of tuberculosis of the cervix is essentially based on antibacillary bactericidal drugs (Rifampicin, Isoniazid, pyrazinamide, streptomycin) and antibacillary bacteriostatic drugs (Ethambutol, Ethionamide). The efficacy and safety of treatment should be carefully monitored. The surgical management of uterine adhesions currently imposes a hysteroscopy to improve fertility. The use of surgical treatment should be reserved for the management of complications (fistulas or abscesses) or in case of resistance or relapse in well conducted medical treatment.This treatment must be preceded and followed by drug treatment. The post treatment surveillance of tuberculosis of the cervix requires regular speculum examination and control biopsies, if necessary[8].

CONCLUSION

Cervical tuberculosis is an uncommon genital location. A definitive diagnosis of TB requires isolation of tubercle bacilli, although many authorities accept a diagnosis based on histological examination, which confirms granulomata. The treatment of tuberculosis is essentially medical. Surgical intervention may be indicated in persistent and recurrent disease despite adequate medical treatment.

CONSENT

Consent was obtained from patient for publications of this case report and accompanying images

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REFERENCES

1. Nogales-Ortiz F, Villar E: Diagnosis and treatment of tuberculous cervicitis. FeburtshinfeFrauenheilkd 17:677, 1957

2. Varma, T, Glob. libr. women's med.(ISSN:17562228) 2008; DOI 10.3843/GLOWM.10034

3. International Journal of Reproduction,Contraception, Obstetrics and Gynecology Bettaiah R et al. Int J Reprod Contraception Obstet Gynecol. 2016 Aug;5(8):2891-2894 www.ijrcog.org

4. Hasselgren PO, Bolin T: Postmenopausal tuberculous pyometra. Acta Obstet Gynecol Scand 56:23, 1977

5   Schaefer G: Female genital tuberculosis. Clin Obstet Gynecol 19:223, 1976

6. Daly JW, Monif GRG: Mycobacteria. In Monif GRG (ed): Infectious Diseases in Obstetrics and Gynaecology. p 301, 2nd ed.. Philadelphia, Harper & Row, 1982

7. Cheng-Ta Yang, Yi-Hsuan Lee, Gwo-Jong Hsu. Tuberculosis of the uterine cervix. Taiwanese Journal of Obstetrics & Gynecology 51 (2012): 449-451

8. Moussa, B., Valentin, K., Adama, O., Aziz, D.A., Idrissa, Z. and Goumbri, L.O. (2016) Tuberculosis of the Uterine Cervix: About a Case and Literature Review. Open Journal of Obstetrics and Gynecology, 6, 734-739.)

9. Chakraborty, P., Roy, A., Bhattacharya, S., Addhya, S. and Mukherjee, S. (1995) Tuberculous Cervicitis: A Clinicopathological and Bacteriological Study. Journal of the Indian Medical Association, 93, 167-168.)

10. Agrawal, S., Madan, M., Leekha, N. and Raghunandan, C. (2009) A Rare Case of Cervical Tuberculosis Simulating Carcinoma Cervix: A Case Report. Cases Journal, 2, 161) Falk V,

11. Ludviksson K, Agren G: Genital tuberculosis in women: Analysis of 187 newly diagnosed cases from 47 Swedish hospitals during the ten-year period 1968 to 1977. Am J Obstet Gynecol 138:933, 1980

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1. Type of Articles

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Original Articles: Articles reporting on original research using quantitative and/or qualitative studies could be submitted to EJRH.

Review Articles: Review articles on all aspects of reproductive health issues could be considered for publication in the EJRH.

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Program Briefs: A one or two pages of description of a program run by governmental or non-governmental organizations could be submitted for publication. These briefs should give short summaries about the objectives, strategies for implementation, and expected outputs of programs that are executed by different organizations.

Short Reports: Preliminary research findings or interesting case studies could be presented in a summarized form to the journal.

2. Uniform Requirements

In order to fulfill uniform requirements for the journal, the following instructions have to be followed by authors:
The manuscript should be a total of 3000 to 4000 words.
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Title page: The title page should have title of the article; name of each author and institutional affiliation, and address of the corresponding author.

Abstracts: It should not be more than 250 words. It should summarize the background, objective, methods, major findings and conclusions.

Tables and Figures: All tables and figures should be submitted on separate sheets of paper and be clearly labeled in the order of their citation in the text. A reader should be able to read only the tables and easily understand all information without reading the text.
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