

Prevalence of stillbirth and associated Factors among immediate post-partum mothers at Felegehiwot comprehensive specialized hospital, northwest Ethiopia: An institution based cross-sectional study

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Abstract

Background Stillbirth rates are important indicators of the quality of antenatal and obstetric care in the community. In Ethiopia many neonatal deaths and almost all stillbirths are underreported. Therefore, this study aimed to determine prevalence of still birth and associated factors among immediate post-partum mothers. **Methods** An institution based cross-sectional study was employed at Felegehiwot comprehensive specialized hospital from March to May 2016 (n=310). A pretested structured interviewer administered questionnaire and medical chart reviews were used to collect data from immediate post-partum mothers. Data were entered using Epi Info version 3.5.4 and analyzed using SPSS version 20. Bivariate and multivariable logistic regression model was fitted to identify predictors of stillbirth. Adjusted Odds Ratio (AOR) with a 95% confidence interval (CI) was computed to assess the strength of association. Variables with p-value less than 0.05 in the multivariable considered as significant predictors of stillbirth. **Result** The prevalence of stillbirth was 8.7% with (95%CI: 5.8, 12.4). Previous history of stillbirth; [AOR=4.7, 95%CI (1.90-24.76)], labor complications [AOR=4.9, 95%CI (1.30-18.58)], Partograph use [AOR=0.25, 95%CI (0.10-0.80)], and twin delivery [AOR=6.7, 95%CI (1.40-32.74)] were significant predictors of stillbirth. **Conclusion** The magnitude of stillbirth in this study was higher. Multiple pregnancies, previous stillbirth, and complicated labor positively associated with stillbirth. Whereas use of partograph during labor significantly reduced stillbirth. This finding suggests that proper management of labor is mandatory to reduce stillbirth.

Background

The World Health Organization (WHO) defined stillbirth as baby born with no signs of life at or after the age of viability (28 weeks' gestation)[1]. Globally, approximately 4 million stillbirths occurs every year, of whom, half million stillbirths occur at the time of labor and the majority of cases occurred in developing countries[2]. In Sub-Saharan Africa, stillbirths account for more than 3% of all deliveries each year[3]. The average stillbirth rate in developing countries has been reported to be 26 per 1000 births, which is five times higher than developed countries of 5 per 1000 births[2, 4]. Stillbirths occurred during perinatal period of which half of all stillbirths occurred in the intra partum period of labor and delivery[5]. Stillbirths were constituted the highest rates of all the adverse pregnancy outcomes and common in developing countries[6].

Stillbirth rates are important indicators of the quality of antenatal and obstetric care in the community[7]. Reports of stillbirths and mortality came from officially registered deaths, however most of cases are under reported. The underreporting of neonatal death and stillbirth is neglected and hidden in the global health agenda usually resulted from low institutional delivery. Isolation of women and newborn during postpartum period, community norm of acceptance of newborn death as normal, home delivery and low utilization of vital registration in the country were factors contributed for lower report of stillbirth [7]. Magnitudes of stillbirths vary in different low- and middle-income countries ranged from 35.6 to 6.8 per 1000 births in Bangladesh and Thailand, respectively[8, 9]. Quality of antenatal and obstetric care and most of which are thought to be preventable. Different factors associated with stillbirth and other adverse

birth outcome, such as socio-demographic characteristics of a women (age, marital status, occupation and place of residence), obstetrical characteristics (parity, previous still birth, obstetrical infections, fetal presentation, obstetric complications and Rh iso-immunization) and health service factors (ANC and intra partum management)[3, 8, 10–16]. Different interventions made to lessen the impact of stillbirths such as focused antenatal care for pregnant women and increasing institutional delivery were some of the interventions. There is limited study conducted in the study area regarding the magnitude and determinants of stillbirth.

Hence, this study aimed to assess the prevalence of stillbirth and associated factors among immediate post-partum mothers. The finding of this study might be used to reduce adverse birth outcomes based on evidences.

Methods And Materials

Study design setting and period

An institution based cross-sectional study design was employed at Felegehiwot comprehensive specialized hospital from March 10 to May 10, 2016. The city is located 565 Km from Addis Ababa in the northwest Ethiopia. According to Amhara Bureau of finance and economic development report, the city hosts a population of 277,566. In the town there are six governmental health centers, one comprehensive specialized hospital and five higher private clinics.

Regarding, to maternal health services of Felegehiwot comprehensive specialized hospital has obstetrics, high risk, and Gynecology wards used for patient admission and evaluation. The hospital serves more than five million people in the catchment area and neighboring regions.

Population of the study

All mothers who gave birth at Felegehiwot comprehensive specialized hospital were the source population for this study. All mothers who give birth to fetus of whose gestational age was 28 completed weeks and above were eligible and took part in the study.

Sample Size and Sampling Procedure

Sample size was determined using single population proportion with the assumptions of proportion of stillbirth was 7.1% [10], 3% margin of error, and 95% confidence interval (CI) and taking 10% no-response rate. The final calculated sample sized became 310. The systematic random sampling technique was used to select the final study participants. According to Feleghiwote comprehensive specialized hospital statistics on average 6000, 500, 17 deliveries reported annually, monthly, and daily correspondingly.

Data collection procedure

Pre-tested structured interviewer-administered questionnaire and medical chart review were used to collect data about socio-demographic and clinical characteristics. Initially, the questionnaire was prepared in English then translated to local language (Amharic) and back to English by language expert to check its consistency. After extensive evaluation, final version of the questionnaire was developed. The questionnaire contained information on socio-demographic profile, obstetric, gynecological, and behavioral, health status, medications taken and birth outcome. Moreover, to supplement the primary data, with chart reviews of target mothers were used. Two diploma and one BSc midwives were recruited from Bahir Dar Health Science College as data collectors and supervisor, respectively. Mothers immediately after delivery, before leaving the maternity ward were interviewed.

To maintain data quality, one day training was given for supervisors and data collators on questionnaire contents, data quality and confidentiality respondents before data collection. On daily basis principal investigator and supervisor checked completeness and consistency of collected questionnaires.

Data processing and analysis

Data were coded and entered in to Epi Info version 7 and exported to SPSS version 20 for further processing and analysis. Descriptive statistics such as mean, median, proportions were carried out and text, graph, and tables were used to present the data. Binary logistic regression model was fitted to identify factors associate with still birth. Crude and Adjusted Odds ratio with 95% CI were used to describe the strength of association between outcome and predictor variables. Variables with p value less than 0.05 in the multivariable model considered as statistical significantly associated with stillbirth.

Results

Socio-demographic characteristics

A total of 310 respondents were recruited with response rate of 100%. The mean (SD) age of mothers was 26.6(\pm 5) years, most (94.5%) of them were married, (60.6%) were urban dwellers, and more than two third (68.1%) of them were housewives. More than one-third (38.4%) of respondents were unable to read and write, majority (87.1%) of mothers were orthodox Christians (Table 1).

Obstetrics related characteristics

More than half (56.5%) of mothers were multiparous, most (84.6%) of them had interparty interval \geq 2 years from current parity. The majority (91.0%) of mothers had at least one ANC follow up for the current delivery and most of the recent pregnancies (89%) were wanted, planned and supported. Nearly two-third 225 (72.5%) of the mothers were delivered at term and proportion of preterm delivery was 16.2%. Majority

(89.0%) of labor initiated spontaneously and 47.4% of mothers had at least one obstetric complications, of which, ante partum hemorrhage, pregnancy induced hypertension, and anemia were the most common complications. More than one fifth (12.1%) of participants had premature rupture of membrane (PROM) in the current labor delivery process (Table 2).

Labor and delivery related characteristics

More than half (53.5%) mothers gave birth through spontaneous vaginal delivery, most (93.9%) of deliveries were single, 63.2% newborns were male, and to 67.7% labors Partograph were used. The mean birth weight was 1810 SD± 491 grams, nearly one-fourth 23.5% had low birth weight. Historically, 11.0% of women had experience of stillbirth in the preceding births. Two third (Table 3).

Prevalence of stillbirth among immediate postpartum mothers

This study showed the magnitude of stillbirth were 8.7% with (95%CI: 5.8 % 12.4%) among total births. Of stillbirths, 59.3% were occurred after admitted to the hospital with positive fetal heart beat.

Factors associated with stillbirth

In the multivariable logistic regression analysis; twin delivery, Paratograph use, previous history of still birth, and labor complication were significant predictors of stillbirth at a p-value 0.05. Mothers who had history of labor complication the odds of still birth was 4.9 [AOR = 4.9 95 %CI (1.30–18.58)] times higher compared to those mothers who had no complications. Similarly, mother who gave twin delivery the odds of stillbirth were 6.7 [AOR = 6.7, 95%CI (1.40–32.74)] times higher compared to those who gave singleton birth. Those mothers whose labor were followed by using Partograph the odds of stillbirth were decreased by 75% [AOR = 0.25, 95%CI (0.10- 0.80)] compared to those mothers whose who had not used. The odds of stillbirth were 4.7 [AOR = 4.7; 95%CI (1.90–24.76)] times higher among those mothers who had history of stillbirth in the previous pregnancies compared to those who had no such history. (Table 4)

Discussion

The prevalence of still birth in this study was 8.7% with (95%CI: 5.8 % 12.4%). This finding was consistent with the results from Hospitals in Ethiopia ranged from 6% to 7.72% [6, 10, 11, 16, 17]. However, this finding was higher than results from Tanzania (3.6%)[18], Zambia (3.4%)[19], Ghana (2.39%)[3], Malawi (3.6%)[20], Nigeria (2.34)[12], and Gamo Gofa, Southern Ethiopia (1.9 %)[14]. This finding was also higher than study findings from EDHS 2011(1.8%), EDHS 2016 (11.7 per 1000 births)[21]. Similarly, the current finding is higher than a systemic review from sub-Saharan African countries where the prevalence of still birth ranged from 2.1 to 3.3% [22]. The possible explanations for the observed variations might be because of quality of health service, socio-cultural factors and community awareness. In addition, methodological differences between studies where community based studies underestimated the

prevalence and under reporting of stillbirth among community members are common. Furthermore, most of the deliveries in the referral hospitals were complicated and transferred from other primary health facilities which increased the probability of stillbirth. Despite better health services and high skilled professionals in the hospitals, delays from mother's health seeking behaviors and poor referral system in the lower health facilities contributed to increased rate of stillbirth in the health facilities.

Previous stillbirth history were associated with increased stillbirth outcome the current delivery. This finding was consistent with the study result in Nigeria[12]. This might be due to the fact women who had experience of stillbirth in the preceding births were at higher risk of having recurrent stillbirths[23]. Since poor obstetrics histories are recurrent and with unknown underlying causes. Similarly complication during labor and delivery associated with increased stillbirth occurrence compared those who had normal labor and delivery. This finding was also comparable with study done in Mekelle town, Tigray regional State, Ethiopia [13]. Complications during labor and delivery might induced intra-uterine oxygen inadequacy which leads to fetal distress which leads to stillbirth. This finding was line with other finding in India[24]. Findings of this study specified that, multiple pregnancy was associated with increased occurrence of stillbirth compared singleton birth. The reason could be intrauterine growth restrictions and birth defects and mechanical factors that are common in multiple pregnancy which increased the vulnerability of stillbirth and these multiple pregnancies require special medical interventions which is more accessible and available in our study area. This result is in agreement with findings in northwest Ethiopia [11].

Labor and delivery which was followed by using partograph associated with lower occurrence of stillbirth compared those who do not used. Since partograph is a labor follow up chart recommended by WHO, appropriate use of partograph can help health professionals to early detection of danger signs during labor[25]. Therefore, it can prevent stillbirth by early detection and prompt management of labors at highest risk of complications and danger signs. It also tells us the quality of intra partum care[8, 16]. From 27 stillbirths found in this study majority 16 (59.7%) of stillbirths were occurred during intra partum period that can be averted with the appropriate intra partum care during labor complications like preterm labor, prolonged second stage of labor and mechanical factors (like obstructed labor, uterine rupture, mal-presentations, mal-position). In addition, non-reassuring fetal heart rate had significantly association with stillbirth outcomes. This is supported by systematic review study done from sixteen hospitals and community based prenatal mortality studied in Ethiopia [22]and agree with other reports[20, 26]. Therefore, identification and management of the complications and provision of care by skilled health care providers, availability and utilization of comprehensive emergency obstetric care may improve and keys to reducing stillbirths. Consequently, there is a need to reinforce and improve health workers' abilities to properly monitor women in labor at all levels of care for early identification and management of complications. This includes early referral if a woman is at a health center has complications during antenatal follow up and labor delivery process.

Limitation

Firstly, since it was based on institutional study it is difficult to generalize to the whole community. Secondly, this study shared the limitations of cross-sectional studies and hence may not be possible to establish temporal cause effect relationship between adverse birth outcomes and explanatory variables. Besides, as the study was in a referral hospital, it may overestimated the stillbirth rate and not show the real picture of these stillbirth outcomes in the area

Conclusions

The magnitude of stillbirth in this study was higher. Multiple pregnancies, previous stillbirths, complicated labor associated with increased stillbirth. Whereas, the use of partograph significantly reduced stillbirth. This finding suggests that proper management of labor is mandatory to reduce stillbirth.

Abbreviations

ANC: Antenatal Care, AOR: Adjusted Odds Ratio, CI: Confidence Interval, EDHS, Ethiopia demography and Health Suurvey, IUFD: Intera-Uterine Fetal Death, PROM: Premature Rupture of Membrane, SD Standard Deviation, SPSS: Statistical package for Social Science, WHO: world Health Organization

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the ethical committee of College of Medicine and Health Sciences, Bahir Dar University. Letter of permission was also obtained from Amhara Regional State Health Bureau and Felegehiwot Comprehensive Referral Hospital. Verbal informed consent was obtained from each study participant. Similarly; the participants were informed about purpose of the study. Participants were also informed on data confidentiality issues, on voluntary basis and they can refuse from the study at any time if they are not comfortable on the questionnaire at any step.

Consent for publication

Not applicable

Availability of data and material

Data will be shared up on reasonable request from the corresponding author.

Authors' contributions

AM conceived the study. AM, MA and KST equally participated in the design, data collection, statistical analysis and writing-up of the manuscript. All authors read and approved the final manuscript.

Competing interest

The authors declared that they have no competing interest.

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Tables

Table 1:-Socio-demographic characteristic of mothers who gave birth at Bahir Dar Felegehiwot Referral Hospital, 2016(n=310)

Characteristics	Frequency	Percentages
Age		
<20	15	4.8
20-34	261	84.8
>35+	34	11
Marital status		
Married	274	88.4
Single	36	11.6
Residence		
Rural	122	39.4
Urban	188	60.6
Educational status		
Unable read and write	119	38.4
Primary and secondary school	105	33.9
College and above	86	27.7
Income level in ETB		
<1500	167	53.9
1500-2500	80	25.8
>2500	63	20.3
Religion		
Orthodox	270	87.1
Muslim	37	11.9
Others	3	0.9
Occupation		
Housewife	214	68.9
Employed	90	29.1
Other	6	2.2

Table 2: Obstetrics and related characteristics of mothers who gave birth at Felegehiwot comprehensive specialized hospital, 2016(n=310)

Characteristics	Frequency	Percentages
Condition of current Pregnancy		
Planned, wanted and supported	264	85.2
Unplanned	46	14.8
Current pregnancy birth interval (n=175)		
<2 years	27	15.4
≥2 years	148	84.6
Parity		
1	140	45.2
2-4	138	44.5
>5+	32	10.3
Previous history of stillbirth		
Yes	34	11.0
No	276	89.0
Gestational age in weeks		
Term	225	72.5
Preterm term	49	16.2
Post term	36	11.6
ANC follow up		
Yes	282	91.0
No	28	9.0
Obstetric complications		
No	163	52.6
Yes	147	47.4
Obstetric and medical complications(n=147)		
Pregnant induced Hypertension	39	26.2
Oligo-hydraminouse	11	7.4
Gestational diabetes mellitus	5	3.4
Ante partum hemorrhage	23	15.4
RH-factor	19	12.8
Anemia	8	5.4
Preterm	49	16.2
PROM	18	12.1
Previous caesarean section	9	6.0
Others*	6	4.0

Note: others* chorioaminitis, IUGR (intra uterine growth restriction)

Table3:- Labor and delivery related characteristics of mothers and birth outcome at Felegehiwot Comprehensive Specialized Hospital, 2016

Characteristics	Frequency	Percentage
Labor complications		
Yes	163	52.6
No	147	47.4
Labor complications(n=163)		
Non reassuring fetal heart rate pattern	50	15.5
Prolonged labor	48	16.1
Mal presentation	25	8.1
Obstructed labor	11	3.5
Malposition	8	2.6
Uterus rupture	10	3.2
Others*	11	3.6
Status of labor		
Spontaneous	276	89.0
Induced /augmented	34	11.0
Sex of newborn		
Male	196	63.9
Female	114	42.1
Mode of delivery		
Caesarean section	119	38.4
Instrumental	25	8.1
Spontaneous vaginal delivery	166	53.5
Weight of new born baby		
<2500g	73	23.5
25000-4000g	224	72.3
≥4000g	13	4.2

Note: others*. Cord prolapsed, chorioaminitis.

Table 4: Bi-variable and multivariabel logistic regressions on different variables towards stillbirth in post-partum mother who gave birth at FelegeHiwot Referral Hospital, 2016(n=310)

Variables	Still birth		Crud OR (95% CI)	Adjusted OR(95%CI)
	Yes	No		
Residence				
Urban	10	178	1	1
Rural	17	105	2.88(1.49-7.94)	1.12(0.35 3.62)
History of still birth				
No	20	256	1	1
Yes	7	27	3.31(1.24-8.20)	4.7(1.90 24.76)□
Parity				
1	9	131	1	1
2-4	13	125	1.5(0.63 3.67)	1.6(0.47 5.72)
5	5	27	2.7(0.84 8.68)	3.3(0.09 3.91)
History of labor complication				
No	4	140	1	1
Yes	23	143	5.6(2.05 17.20)	4.9(1.30 18.58)□
Parthogragh used				
No	15	86	1	1
Yes	12	197	0.35(0.16 0.78)	0.25(0.10 0.80)□
Type of delivery				
Single	21	270	1	1
Twin	6	13	5.9(2.05 17.20)	6.7(1.39 32.74)□
Sex of new born				
Female	6	108	1	1
Male	21	175	2.2(1.85 5.52)	4.3(0.23 14.91)

* show a p-value \leq 0.05