Prevalence of preterm premature rupture of membrane and its associated factors among pregnant women admitted in Debre tabor general hospital, North West Ethiopia: A facility based cross-sectional study

Dagne sewyew Addisu (✉ dagneaddisu7@gmail.com)

Debre tabor university   https://orcid.org/0000-0002-6087-6384

Abenezer Melkie

Debre Tabor University

shimels Biru

Debre Tabor University

Abstract

Abstract Background: Premature rupture of membrane is a significant cause of maternal and neonatal morbidity and mortality both in high and low income countries which accounts 5-10 % of all deliveries. Due to different factors associated with the quality of health care given and socio-economic factors, the effect of preterm premature rupture of membrane is worsen in low-income countries. However, very little evidence is known about the problem in Ethiopian particularly in the study area. Therefore, this study was aimed to determine the prevalence of preterm premature rupture of membrane and its associated factors among pregnant women admitted in Debre tabor general hospital. METHODS: Facility based cross-sectional study was conducted at Debre tabor general Hospital from December 14 – June 20, 2019. A total of 424 mothers were included in the study. Systematic random sampling technique was used selected the study participants. A combination of chart review and interview were used to collect the data. Data entry and analysis were made by using Epi-data version 4.2 and SPSS versions 23 respectively. Both descriptive & analytical statistics were computed. Statistical significance was considered at $P<0.05$ and the strength of association were assessed by using adjusted odds ratio. Result: The prevalence preterm premature rupture of membrane was found to be 13.7%. Pregnant women with abnormal vaginal discharge [AOR=5.30, 95%C1=2.07-13.52], urinary tract infection [AOR =2.62, 95%Cl =1.32-5.19], history of premature rupture of membrane [AOR =3.31, 95%Cl =1.32-8.27], vaginal bleeding [AOR =2.58, 95%Cl =1.14-5.82] and mid upper arm circumstance <23cm [AOR =6.26, 95%Cl =3.21-12.20] were found to be associated with preterm premature rupture of membrane. Conclusions: The prevalence of preterm premature rupture of membrane was high. Abnormal vaginal discharge, urinary tract infection, vaginal bleeding, previous premature rupture of membrane and mid upper arm circumstance <23cm were factors associated with an increased risk for preterm premature rupture of membrane. Thus, early screening, diagnosis and quickly treatments of urinary tract infection and abnormal vaginal discharges during pregnancy were recommended to reduce the risk of preterm premature rupture of membrane. Keywords: premature rupture of membrane, prevalence, Debre tabor general hospital, risk factors

Background

Preterm premature rupture of the membranes (PPROM) is defined as loss of amniotic fluid before the onset of labor in pregnancies prior to 37 weeks of gestation which is characterized as painless flow of fluid that escapes out of the vagina (sometimes steady leakage of small volume of watery fluid coming out of the vagina) and a change in color or a reduction in the size of the uterus (1, 2).

Preterm premature rupture of membranes (PPROM) is one of the clinical subtypes of preterm birth which affects 3- 4.5% of all pregnancies globally and between 60% - 80% of the affected pregnant will deliver within 7 days(2, 3).

The exact causes of preterm PROM is unknown. However; previous studies indicated that multifactorial etiology such as socio-demographic, obstetric, medical and behavioral factors are responsible for the occurrence of PPROM. Some of those factors are maternal ethnic origin, previous adverse pregnancy

outcome, uterine over distention, smoking, low body mass index, genitourinary tract infection, maternal depression, pre-pregnancy stress, poor diet, assisted fertility, and periodontal disease are the major contributing factors for preterm PROM(1, 4-6).

Preterm PROM is a major cause of perinatal morbidity and mortality which accounts around 40% of preterm deliveries and 18–20% of perinatal deaths. Generally, the burden of preterm PROM ranges from maternal, perinatal and neonatal mortality and morbidity to countrywide economic loss due to drug expense, hospitalization, absenteeism from the work and expense to the health professionals(1, 7).

PPROM is the primary cause of preterm deliveries, perinatal and neonatal mortality and morbidity which is accountable for one-third of preterm births. Preterm newborns contribute to only 8-10%of live births but responsible for 90% of neonatal deaths. Preterm infants are mainly susceptible to problems due to impaired respiration, difficulty in feeding, poor body temperature regulation and greater risk of infection (3, 8).

The consequences of PPROM for the newborn includes neonatal morbidity and mortality associated with prematurity, increase the risk for neonatal resuscitation and infection. In addition, respiratory distress syndrome (RDS), intraventricular hemorrhage (IVH) and necrotizing enterocolitis (NEC) are another complication which accounts to the majority neonatal mortality(9, 10).

PPROM also expose women for significant pregnancy related complications. Some of those maternal complications are puerperal infection, placental abruption, increased caesarean section rates, chorio-amnionitis, higher incidence of operative deliveries, psychological and lactational problems, postpartum endometritis, disseminated intravascular coagulopathy, maternal sepsis, delayed menses and Asherman syndrome(11-13).

In Ethiopia training manuals and guidelines were prepared to make health professionals experienced in managing a woman with obstetric emergencies including preterm PROM. Additional approaches were also established to address the problem including referring women with pre-term prolonged PROM (>12hours) to a referral-level hospitals for evaluation and administration of prophylactic antibiotics and steroid following preterm PROM (4).

Although the prevalence and associated factors of preterm premature rupture of membrane were well studied in high income countries, there is a scarcity of locally generated evidence on prevalence and associated factors of preterm premature rupture of membrane in Ethiopia particularly in the study area. Therefore; this study was aimed to determine the prevalence of preterm premature rupture of membrane and its associated factors among pregnant women admitted in Debre tabor general hospital, North West Ethiopia. This finding is important to design evidence based intervention and appropriate prevention strategies for reduction of preterm PROM in the study area as well as in country. In addition, identification of maternal risk factors before conception or early in pregnancy could leads to the innovation of new and effective interventions that could help to prevent PPROM.

Methods

Study settings and design

Hospital based cross-sectional study was conducted at Debre tabor general Hospital Obstetrics and Gynecology department, high risk and labor ward from March 14 - June 20, 2019 GC. This hospital is found in South Gondar zone, Amhara Regional state of Ethiopia. It is located 103 km from Bahir Dar, the capital city of Amhara regional state and 667km from Addis Ababa, the capital city of Ethiopia.

According to 2015 Debre Tabor town health statics report, the total population in the town was around 83081and from those, 43301 (52.12%) were Females and 39780 (47.88%) were males. The town has one general hospital, three health center and four private clinics.

Debre tabor general Hospital is having around 5 major wards and gives service for more than 5 million people within its catchment area. The labor ward provides services for approximately 380 deliveries per month. The Department of Obstetrics and Gynecology has maternity ward, high risk ward and labor ward. High risk ward has around 20 beds and approximately 80 pregnant women were admitted in this ward per month. Maternity, labor ward and high risk ward are staffed with four obstetrics and gynecology specialists, twenty three midwives, five emergency surgeons and twenty four interns.

Study population

All pregnant women who were admitted in obstetric wards of Debre tabor general hospital between 28 to 36^{+6}weeks of gestation were the source population. This study included all pregnant women who were admitted in obstetric wards of Debre tabor general hospital during data collection period between 28 to 36^{+6}weeks of gestation.

Sample size determination

The required sample size was determined using a single population proportion formula [n = [(Za/2)2*P (1-P)]/d2] by assuming a 95% confidence level of Z a/2 = 1.96, marginal of error 5%, and prevalence of preterm PROM 50% since there is no previous similar studies. Accordingly, the sample size was 385. By adding 10% non- response rate, the final sample size was 424.

Study variables

Socio-demographic variables include MUAC of the mother, age, ethnicity, residency, religion, educational status, marital status, average monthly income and occupational status. Obstetric variables include gravidity, parity, gestational age, ANC follow up, vaginal bleeding in current pregnancy, history of premature rupture of membrane, history of preterm labor, history of abortion, type of pregnancy, polyhydramnios in current pregnancy, presentation and labor pain. Medical and behavioral variables include abnormal vaginal discharge, gestational diabetes mellitus, anemia, lifting heavy objects, falling in accident, UTI, Cigarette smoking, Cocaine use, alcohol addicted and chat chewing

Sampling and sampling procedure

Study participants were selected from high risk and labor ward by using systematic random sampling technique. The average numbers of women who were admitted in Debre tabor general hospital during the data collection periods were estimated based on the previous admissions which were found by reviewing a six months registration book in high risk and labor wards prior to data collection. Totally 480 pregnant women were admitted in high risk wards in six months. We planned to collect the data within six months. So to find the sampling interval; the total number of women who were admitted in six months (480) was divided by the total number of sample size (424) and it was approximately 2. The first woman was selected by lottery method then every other woman who was admitted in the high risk ward was recruited for the study.

Data collection tools and procedures

Interview, chart review and measurements were used to collect the data. Three BSc midwives and one supervisor were used for data collection and supervisory activity respectively after training was given for them. Structured interviewer-administered data collection formats were adapted and modified from different kinds of literature. Questionnaires were structured into four logical sections (socio-demographic characteristics, obstetric related factors, medical history and behavioral related factors). Data on respondent's specific socio-demographic, obstetric, medical and behavioral characteristics were collected by reviewing her medical records and through interview of the respondents.

In addition, physical measurements were used to obtain data on mid upper arm circumstance (MUAC) of pregnant women. In this condition, MUAC of each woman was measured at the midpoint between the tips of the shoulder and elbow of the left arm using non-elastic, non-stretchable MUAC tapes. In this study, a poor nutritional status of the mother was defined as MUAC < 23 cm(1).

Gestational age was estimated using from 1st trimester or 2nd trimester ultrasound (up to 24weeks) and last normal menstrual period.

Data management and analysis

Data were entered into EPI data version 4.2 then exported to SPSS version 23 for analysis. Descriptive statistics such as cross tabulations and frequencies were computed. Binary logistic regressions were used to select variables associated with preterm PROM. In binary logistic regression, both bivariate and multivariable logistic regression was computed. In bivariate analysis, independent variables with p value less than 0.2 were selected as a candidate for multiple logistic regression. In multivariable logistic regression; Statistical significant was considered at P<0.05. Adjusted Odds Ratio (AOR) and their 95% Confidence Interval (CI) were used to measure strength of association. Back ward stepwise logistic regression was applied. The Hosmer -Lemeshow goodness-of-fit statistic was used to check if the necessary assumptions for multiple logistic regressions were fulfilled and the model had a p-value >0.05 which proved the model was good.

Results

Socio-demographic characteristics of respondents

A total of 424 pregnant women were enrolled in the study with a response rate of 100%. The mean age of the study participants were 29.76 years with standard deviation (SD) of ± 6.239 years. Almost all, 406(95.8%) of pregnant women were Amhara in ethnicity. Nearly three -fourth; 311 (73.3%) of pregnant women were from urban areas and majority, 377(88.9%) of respondents were orthodox Christian follower (Table 1).

Past and current obstetrics related characteristics of respondents

Majority, 381(89.9%) of respondents had ANC follow up in current pregnancy and 305(71.9%) of pregnant women were multigravida. Most of respondents (86.79%) had cephalic presentation and 31(7.1%) of pregnant women had history of preterm PROM (Table 2).

Medical and behavioral related characteristics of respondents

Regarding to medical conditions of pregnant women; 86 (20.3%) of pregnant women had UTI in current pregnancy, 28(6.6%) had abnormal vaginal discharge and 18(4.2%) had gestational diabetes mellitus. All of; 424(100%) pregnant women didn't use Cocaine, chat and Cigarette smoking (Table 3).

Prevalence of preterm PROM

The prevalence preterm premature rupture of membrane was found to be 13.7% with [95% CI=10.6-17.2].

Determinants of preterm PROM

The association between preterm PROM and socio-demographic, obstetrical, medical and behavioral related characteristics of pregnant women were assessed. In the bivariate analysis; abnormal vaginal discharge during pregnancy, residency, maternal age, vaginal bleeding in current pregnancy, average monthly income, MUAC of the mother, anemia, UTI and previous history of PROM became significant at 0.2 level of significance. However; abnormal vaginal discharge, lifting heavy objects, previous history of PROM, average monthly income, MUAC of the mother and UTI were remained significantly and independently associated with preterm PROM in the multivariable analysis.

Pregnant women with abnormal vaginal discharge were 5.30times higher odds of developing preterm PROM as compare to their counterpart [AOR=5.30, 95%C1=2.07-13.52].

Those pregnant women with history of UTI in current pregnancy were 2.62 times higher odds of developing preterm PROM than those who didn't have UTI [AOR =2.62, 95%CI =1.32-5.19].

Pregnant women who had history of PROM were 3.31times more likely to develop preterm PROM than those who didn't have [AOR =3.31, 95%CI =1.32-8.27].

Women who had history of vaginal bleeding in current pregnancy were 2.58times more likely develop preterm PROM as compare to their counterpart [AOR =2.58, 95%CI =1.14-5.82].

Pregnant women whose MUAC less than 23cm were 6.26times higher odds of developing preterm PROM than those greater or equal to 23cm[AOR =6.26, 95%CI =3.21-12.20] (Table 4).

Discussion

The prevalence preterm premature rupture of membrane was found to be 13.7% with [95% CI=10.6-17.2]. This finding was higher than the study finding from Rio Grande, in Brazil (3.1%)(14), Cork University Maternity Hospital in Ireland (0.1%) (15), and Canada(2.3%)(16). This discrepancy might be due to the difference between the quality of services they provided and socio-economic status of study participants. The former studies were from developed countries where good qualities of health care services were given for early screening and treatments of risk factors for preterm PROM such as UTI and abnormal vaginal discharge during pregnancy.

This finding was also higher than the study finding in Ain Shams Maternity Hospital Egypt(5.3%)(17) and tertiary Hospital in Nigeria (3.3%) (18) . This discrepancy might be due to the difference between study setting and the accessibility and the quality of services in study are. In addition; this study was done in the area where poor nutritional status was high. Poor nutritional status predispose pregnant women to different obstetric complications including PROM

On the other hand, this finding was lower than the study findings in Jiangsu Province Hospital at china (19.2%)(3). The difference could be attributed to the time gap between the studies. In addition, behavioral risk factors for preterm PROM such as smoking, cocaine use, and Alcohol consumption were found in the former studies but not found in this study area.

Urinary tract infection (UTI) during pregnancy was significantly associated with the development of preterm PROM. This finding was consistent with study done by Th. Digel Singh et al(19). This could be explained as; UTIs could leads to infections within a pregnant uterus. During UTI, microorganisms could reach to the uterus through blood stream or ascent through the vagina. Micro-organisms produce a variety of proteolytic enzymes which are involved in aspects of microbe pathogenesis including attachment, overcoming maternal mucous membrane and endocervical host defenses. Proteolytic enzymes may also act directly on cervical collagen and amnionchorion leading to premature cervical ripening and weakening of the fetal membranes with subsequent preterm premature rupture of membranes.

This study also indicated that a significant association was noted between abnormal vaginal discharge and preterm PROM. This finding was in agreement with study findings in mekelle city, Ethiopia(4) . This might me due to that abnormal vaginal discharge is a common symptom of genital infections which could results in ascending infection to membranes and decidua. Genital bacteria from the cervico-vaginal

flora elaborate enzymes such as proteases, phospholipases, trypsin and collagenases which cause membrane damage, weakness and subsequent rupture.

In this study, previous history of PROM showed a statistically significant association with preterm PROM. This finding was consistent with the study findings in the University of Calabar Teaching Hospital, Nigeria(20) and Mekelle city, Ethiopia(4). This could be due to untreated genitourinary infection and a short cervical length (cervical incompetence). In addition, obstetric complications are highly recurrent by nature.

This study also indicated that pregnant women with MUAC less than 23cm were significantly associated with preterm PROM. This could be due to that a pregnant woman with MUAC <23cm indicates poor nutritional status. A pregnant woman with malnutrition might also have recurrent genitourinary infections with non-treatment, overexertion, poor hygiene, anemia & poor antenatal care. Such condition finally might result rupture of membrane through membrane weakness and inflammatory response.

In this finding, women who had history of vaginal bleeding in current pregnancy were significantly associated with the occurrence of preterm PROM. This could be due to thrombin which is formed when tissue factor is released from decidual cells as a result of even a small amount of decidual hemorrhage or a consequence of decidual hypoxia. This thrombin regulates genes involved in apoptosis and induces expression of inflammatory cytokines and predominantly interleukin-8. This condition leads to tissue necrosis and degradation of extracellular matrix. This process finally could result in premature rupture of membranes.

Since the study was conducted in a single generalized hospital, the results might not be representative of other institutions and the community. Another limitation is possible to recall bias while determining the gestational age using last normal menstrual period. UTI, abnormal vaginal discharge and previous history of PROM also self-reported information. As a result, this research might be subjected to recall bias since participants might not remember and report past event correctly.

Conclusions

The prevalence of preterm premature rupture of membrane was high as compared to other studies. Different factors such abnormal vaginal discharge, urinary tract infection, vaginal bleeding during pregnancy, previous premature rupture of membrane and MUAC of the mother were factors associated with an increased risk for preterm premature rupture of membrane. Hence, improved nutritional statuses of pregnant women were recommended to decrease preterm PROM. We also recommended early screening, diagnosis and quickly treatments of UTI and abnormal vaginal discharges during pregnancy to reduce the risk of preterm PROM.

Abbreviations

ANC: Ante Natal Care, AOR: Adjusted Odd Ratio, CI: Confidence Interval, COR: Crude Odd Ratio, GDM: Gestational Diabetes Mellitus, IVH: Intra Ventricular Hemorrhage, MUAC: Mid Upper Arm Circumstance, NEC: Necrotize Enterocolitis, PPROM: Preterm Premature Rupture of Membrane, PROM: Premature Rupture of Membrane, RDS: Respiratory Distress Syndrome, SD: Standard Deviation, U/S: Ultra Sound, UTI: Urinary Tract Infection

Declarations

Ethical approval and consent to participate

The data collection was carried out after getting approval for the project proposal from the ethical review board of Debre tabor University College of medicine and health science. An official letter was obtained from the Debre tabor general hospital medical director and respective department heads. Data were collected after informed written consent was obtained from study participants. All of our respondents were above the age 16 years. So we used written informed consent from them. Confidentiality of the information was assured from all the data collectors and investigators sides. The questionnaire was administered anonymously.

Consent for publication

Not applicable in this study

Competing interests

The authors declare that they have no conflict of interests.

Funding

Availability of data and materials

The datasets used in this study are accessible from the corresponding author on rational request.

Authors' contributions

DA wrote the proposal, gives training on data collection, analyzed the data and drafted the paper. AM and SB approved the proposal with some revisions, participated in data analysis and manuscript writing. All authors read and approved the final manuscript.

Acknowledgments

References

1. Workineh Y, Birhanu S, Kerie S, Ayalew E, Yihune M. Determinants of premature rupture of membrane in Southern Ethiopia, 2017: case control study design. BMC research notes. 2018;11(1):927.

2. Smith GN, Rafuse C, Anand N, Brennan B, Connors G, Crane J, et al. Prevalence, Management, and Outcomes of Preterm Prelabour Rupture of the Membranes of Women in Canada. j Obstet Gynaecol Can 2005;6(27).

3. Chandra I, Sun L. Third trimester preterm and term premature rupture of membranes: Is there any difference in maternal characteristics and pregnancy outcomes? Journal of the Chinese Medical Association. 2017;80(10):657-61.

4. Assefa NE, Berhe H, Girma F, Berhe K, Berhe YZ, Gebrehet G, et al. Risk factors of premature rupture of membranes in public hospitals at Mekele city, Tigray, a case control study. BMC pregnancy and childbirth. 2018;18(1):386.

5. Zhou Q, Zhang W, Xua H, Liang H, Ruan Y, Zhou S, et al. Risk factors for preterm premature rupture of membranes in Chinese women from urban cities. International Journal of Gynecology and Obstetrics. 2014;127 254–9.

6. Hackenhaar A, EPAlbernaz, Fonseca T. Preterm premature rupture of the fetal membranes: association with sociodemographic factors and maternal genitourinary infections. Jornal de pediatria. Jornal de pediatria April 2014 2(90):197-202.

7. Gabbe SG, Niebyl JR, Galan HL, Jauniaux ER, Landon MB, Simpson JL, et al. Obstetrics: normal and problem pregnancies e-book: Elsevier Health Sciences; 2016.

8. Oza S, Lawn JE, Hogan DR, Mathers C, Cousens SN. World Health Assembly». Bulletin of the World Health Organization. 2015;93:19-28.

9. Rajan R, Menon V. Preterm premature rupture of membranes: correlates and pregnancy outcome in a tertiary care setting. International Journal of Research in Medical Sciences. 2016;4(8):3310-6.

10. Endale T, Fentahun N, Gemada D, Hussen MA. Maternal and fetal outcomes in term premature rupture of membrane. World journal of emergency medicine. 2016;7(2):147.

11. Vishwakarma K, Patel SK, Yadav K, Pandey A. Impact of premature rupture of membranes on maternal & neonatal health in Central India. J Evid Based Med Health Care. 2015;2:8505-8.

12. Idrisa A, Pius S, Bukar M. Maternal and neonatal outcomes in premature rupture of membranes at University of Maiduguri Teaching Hospital, Maiduguri, North-Eastern Nigeria. Tropical Journal of Obstetrics and Gynaecology. 2019;36(1):15-20.

13. Th. DS, Usham R, Kamei H. Preterm Prelabour Rupture of Membrane: 1 Year Study. Journal of Evolution of Medical and Dental Sciences. 2015;4(49):8495-8.

14. Hackenhaar AA, Albernaz EP, Fonseca T. Preterm premature rupture of the fetal membranes: association with sociodemographic factors and maternal genitourinary infections. Jornal de pediatria. 2014;90(2):197-202.

15. Linehan LA, Walsh J, Morris A, Kenny L, O'Donoghue K, Dempsey E, et al. Neonatal and maternal outcomes following midtrimester preterm premature rupture of the membranes: a retrospective cohort study. BMC pregnancy and childbirth. 2016;16(1):25.

16. Smith GN, Rafuse C, Anand N, Brennan B, Connors G, Crane J, et al. Prevalence, management, and outcomes of preterm prelabour rupture of the membranes of women in Canada. Journal of Obstetrics and Gynaecology Canada. 2005;27(6):547-53.

17. Abouseif HA, Mansour AF, Sabbour S. Prevalence and outcome of Preterm Premature Rupture of Membranes (PPROM) among pregnant women attending Ain Shams maternity hospital. Egyptian Journal of Community Medicine. 2018;36(2).

18. TC O, Enwereji J, Okoro O, Adiri C, Ezugwu E, Agu P. The incidence and management outcome of preterm premature rupture of membranes (PPROM) in a tertiary hospital in Nigeria. American Journal of Clinical Medicine Research. 2014;2(1):14-7.

19. Singh D, Usham R, Kamei H. Preterm prelabour rupture of membrane: 1 year study. Journal of Evolution of Medical and Dental Sciences. 2015;4(49):8495-598.

20. Emechebe C. Determinants and complications of pre-labour rupture of membranes (PROM) at the University of Calabar Teaching Hospital (UCTH), Calabar, Nigeria. Parity. 2015;95:100.0.

Tables

Table 1: Socio-demographic characteristics of pregnant women who were admitted in Debre tabor general hospital, North West Ethiopia, 2019 (n=424)

Characteristics	Frequency	Percent (%)
Age		
15-19	60	14.2
20-34	247	58.3
≥35	117	27.6
Ethnicity		
Amhara	406	95.8
Others (Tigre and Oromo)	18	4.2
Residency		
Urban	311	73.3
Rural	113	26.7
Religion		
Orthodox	377	88.9
Muslim	39	9.2
Protestant	8	1.9
Educational status		
Non-formal education	105	24.8
Formal education	319	75.2
Occupational status		
House wife	211	49.8
Civil servant	86	20.3
Merchant	89	21
Others(student, daily laborer)	38	9
Average monthly income		
<1000	163	38.4
1001-2000	166	39.2
>2000	95	22.4
MUAC of the woman		
<23 cm	67	15.8
≥23 cm	357	84.2

Table 2: Past and current obstetric characteristics of pregnant women who were admitted in Debre tabor general hospital, North West Ethiopia, 2019 (n=424)

Variables	Frequency	Percent (%)
Gravidity		
Primgravida	97	22.9
Multigravida	305	71.9
Grand multigravida	22	5.2
Parity		
Null para	111	26.2
Primi para	129	30.4
Multipara	184	43.4
Gestational age		
28-33week	129	30.4
34-36week	295	69.6
ANC follow up		
Yes	381	89.9
No	43	10.1
Vaginal bleeding in current pregnancy		
Yes	58	13.7
No	366	86.7
History of PROM		
Yes	31	7.3
No	393	92.7
History of preterm birth		
Yes	32	7.5
No	392	92.5
Type of pregnancy		
Singleton	394	92.9
Multiple	30	7.1
Polyhydramnios in current pregnancy		
Yes	17	4
No	407	96
Presentation		
Cephalic	368	86.79
Breech	50	11.79
Others	6	1.42
Labor pain		
Yes	31	7.3

| | 393 | 92.7 |

Table 3: Medical and behavioral related characteristics of pregnant women admitted at Debre tabor general hospital, North West Ethiopia, 2019 (n=424)

Variables	Frequency	Percent (%)
Anemia		
Yes	27	6.4
No	397	93.6
UTI current pregnancy		
Yes	86	20.3
No	338	79.7
Abnormal vaginal discharge		
Yes	28	6.6
No	396	93.4
Gestational diabetes mellitus (GDM)		
Yes	19	4.5
No	405	95.5
Lifting heavy objects		
Yes	58	13.7
No	366	86.7
Falling in accident		
Yes	2	0.5
No	422	99.5

Table 4: Bivariate and multivariable association of preterm PROM and independent factors among pregnant women admitted in Debre tabor general hospital, North West Ethiopia, 2019

Variable	Preterm PROM		COR (95%)	AOR (95%)
	Yes	No		
Age				
15-19	14(23.7%)	45(76.3%)	1	1
20-34	31(12.6%)	216(87.4%)	0.46(0.22-0.93)	0.44(0.19-1.04)
≥35	13(11%)	105(89%)	0.39(0.17-0.91)	0.43(0.16-1.15)
UTI				
Yes	23(26.7%)	63(73.3%)	3.16(1.74-5.71)	2.62(1.32-5.19)*
No	35(10.4%)	203(89.6%)	1	1
Vaginal bleeding during in current pregnancy				
Yes	12(30.7%)	46(79.3%)	1.81(0.89-3.67)	2.58(1.14-5.82)*
No	46(12.6%)	320(87.4%)	1	1
Anemia				
Yes	7(25.9%)	20(74.1%)	2.37(0.95-5.89)	2.05(0.75-5.59)
No	51(12.8%)	346(87.2%)	1	1
Abnormal vaginal discharge				
Yes	13(46.4%)	15(53.6%)	6.76(3.02-15.11)	5.30(2.07-13.52)*
No	45(11.4%)	351(88.6%)	1	1
MUAC of the mother				
<23cm	28(41.8%)	39(58.2%)	7.82(4.24-14.44)	6.26(3.21-12.20)*
≥23cm	30(8.4%)	327(91.6%)	1	1
Monthly income				
<1000 birr	26(16%)	136(84%)	2.07(0.90-4.80)	2.04(0.78-5.31)
1001-2000birr	24(14.4%)	143(85.6%)	1.82(0.78-4.24)	1.37(0.52-3.64)
>2000birr	8(8.4%)	87(91.6%)	1	1
Previous PROM				
Yes	12(38.7%)	19(61.3%)	4.76(2.17-10.45)	3.31(1.32-8.27)*
No	46(11.7%)	347(88.3%)	1	1

Residency				
Urban	38(12.2%)	273(87.8)	1	1
Rural	20(17.7%)	93(82.3%)	1.54(0.85-2.78)	1.61(0.79-3.29)

- * indicates p- value less than 0.05

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- supplement1.pdf