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Magnitude of puerperal sepsis and its associated factors among post-partum mothers admitted to public hospitals of Mekelle city, Tigray, North Ethiopia, 2025: a cross-sectional study

Shushay Gebrehiwet
Adigrat University
Desta Abraha Weldegeorges
destish11@gmail.com
Adigrat University
Semere Reda Abebe
Adigrat University
Meresa Berwo Mengesha
Adigrat University
Haftay Gebremedhin
Adigrat University

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Abstract

Background: Puerperal sepsis is a public health problem both in developing and developed countries and it is among the common causes of maternal mortality and morbidity. Puerperal sepsis is one of the preventable conditions. The aim of this study was to assess the magnitude and factors associated with puerperal sepsis among postpartum mothers admitted to public hospitals of Mekelle city, Tigray region, Northern Ethiopia.

Objective: To assess the magnitude of puerperal sepsis and its associated factors among postpartum mothers admitted to public hospitals of Mekelle city, Tigray, North Ethiopia, 2025.

Methods: An institution-based cross-sectional study was conducted among a total sample size of 368 in Mekelle city public hospitals from April 15 to May 15, 2025. A simple random sampling technique and a structured questionnaire were used during the data collection process. Data was entered into SPSS software version 27 for analysis. Bivariate logistic regression with a P-value of <0.25 was used to detect the association between dependent and independent variables. Multivariable logistic regression with a p-value of <0.05 was also used to identify the statistical association between the outcome variable and selected independent variables via the adjusted odds ratio.

Result: The magnitude of puerperal sepsis was 15.8% with 95% CI, (12.3-19.7). Low parity postpartum mothers including multi parous (AOR= 8.87, 95% CI, (3.691-21.321) and primigravida mothers(AOR=9.921, 95 % CI, 2.946 - 33.4), Spontaneous vaginal delivery (AOR = 3.545, 95% CI: (1.636 - 7.68), rupture of membrane ≥8 hours (AOR= 4.497, CI, (1.922-10.52), and duration of labor ≥ 24 hour (AOR= 4.46, 95%, CI, (1.107-17.96) were significantly associated with puerperal sepsis.

Conclusion: Puerperal sepsis is an unsolved public health problem in the study area. Therefore, it is crucial to implement aseptic techniques during spontaneous vaginal delivery, encouraging the use of awareness creation, and providing formal education at any care services about puerperal sepsis, strictly followed by mothers during labor to avoid prolonged labor.

Introduction

World health organization (WHO) defines puerperal sepsis is an infection of the genital tract occurring from the time of membrane rapture up to the 42nd days of postpartum with two or more of the following present: pelvic pain, fever, abnormal vaginal discharge, abnormal smell/foul odour discharge or delay in uterine involution (1).

Every day in 2023, over 700 women died from preventable causes related to pregnancy and childbirth - meaning that approximately one woman is dying every two minutes. By 2030, Sustainable Development Goal (SDG) target 3.1 is to reduce maternal mortality to less than 70 maternal deaths per 100 000 live births (2).

Worldwide 75,000 maternal deaths occur every year due to puerperal sepsis. Next to postpartum bleeding, unsafe abortion, and pregnancy-induced hypertension, puerperal sepsis is the fourth greatest cause of maternal mortality (3). Globally around 11% of the estimated maternal deaths were due to puerperal sepsis and most of the maternal deaths were in sub-Saharan Africa (Two third of the burden) and southern Asia (4).

Puerperal sepsis (PS) is one of the main causes of maternal mortality and morbidity and still one of unaddressed public health issues (5). Sepsis and septic shock were the main causes of morbidity and mortality among intensive care unit patients in developing countries and it is higher in sub-Saharan countries (6). Prevention of PS in the maternity ward is a big challenge, since the infection occurs outside the hospital, within the hospital when doing procedures or outside of the maternity ward. And there are inadequate health care resources to prevent PS (7).

The prevalence of PS in Tanzania and Nigeria was 11.5% and 2% respectively (8, 9). In Ethiopia Addis Abeba, the prevalence of PS is 12.6% which is the third direct obstetric causes of maternal death next to obstetric hemorrhage 41.1%, hypertension disorder 23% (10). The prevalence of PS in Gondar 17.2% (11), in Hadya zone 20.6% (5).

Prolonged hospital stay, septicemia, disseminated intravascular coagulation, pelvic inflammatory disease, wound dehiscence, pelvic abscess, peritonitis, septic shock, organ injuries infertility, and death are among the maternal complication associated with PS (12, 13).

Factors associated with PS were having postpartum hemorrhage, prolonged labor, premature rupture of membrane (PROM), having laceration, moderate to severe anemia, parity, caesarian section, antenatal care contact, educational status (8, 9, 13).

Materials and Methods

Study setting and period

A Facility-based cross-sectional study was conducted in public hospitals of Mekelle city, Northern Ethiopia, from April to May 2025. Mekelle city covers an estimated area of 109.95 km^2 and it is 783 kilometers from Addis Ababa, the capital city of Ethiopia.

According to the world population prospects (2024), United Nations population estimates the total population of Mekelle city was projected to be 664,246 with annual growth rate 4.24% (14).

Regarding health facilities, there is one referral hospital (Ayder comprehensive specialized referral hospital) and three other public hospitals. Namely Mekelle general hospital, Quiha general hospital and 11 yekatit primary hospital. And monthly admitted to each hospital (208, 207, 116 and 89) respectively. The source and study population were all postpartum mothers admitted to public hospitals and all sampled postpartum mothers admitted to the public hospitals in Mekelle City, Tigray, Ethiopia, during the

study period in 2025 respectively. Sample populations were all randomly selected postpartum mothers admitted in the public hospitals during the study period in 2025. All postpartum mothers admitted to public hospitals in Mekelle City were included in the study. Postpartum mothers who discharged within the first 24,those coming or presenting hours, those coming/presenting for the second time in the study period, critically sick or mentally ill, unable to hear were excluded from this study.

Sample size determination

The sample size was calculated using Epi Info version 7 StatCalc for double population proportions by considering factors associated with puerperal sepsis (caesarian section). The assumptions included a two-sided confidence level of 95%, a power of 80%, an unexposed to exposed ratio 1:1, a proportion of outcome in the unexposed group of 56.5% and odds ratio 0.53 (11) were considered. After adding 10% for nonresponse rate, the final sample size was 368. Accordingly, 368 mothers admitted to public hospitals were included in the study.

Sampling procedure

All public hospitals (4) found in Mekelle city were included in this study. Subsequently, the final sample size was proportionally allocated to each hospital as per their client flow (ACSRH, MGH, QGH, yekatit 11 primary hospital). And the postpartum mothers could be selected from each hospital using systematic sampling techniques. The total number of mothers admitted to all public hospitals in one month was 620 and using proportion allocation formulas to allocate a sample to each public hospital (ACSRH (123), MGH (123), QGH (69), yekatit 11 primary hospital (53)). K interval (every 2) was calculated for each hospital and Participants were selected randomly using a sampling technique using lottery method. Postpartum mothers every k interval was interviewed using a semi structured questionnaire.

Variables

The dependent variables was puerperal sepsis and the independent variables were Socio demographic factors (age, residency, marital status, level of education, Religion, occupation, monthly income), obstetrics and gynecologic factors (parity, place of delivery, number of antenatal care (ANC) follow up, duration of labor, number of per vaginal examination, referral status, postpartum hemorrhage (PPH), caesarian section (CS) wound infection, history of sexually transmitted infections 2 weeks before delivery, duration of rupture of membrane and mode of delivery), health facility related factors (distance home to hospital, bed Lenin was clean,

length of stay at hospital, hand wash and use of gloves, did you get immediate receiving care after admitting hospital, referral status).

Data collection procedures and data quality control

The data was collected using a primary source of data by a semi-structured interviewer administered questionnaire. The administrated questionnaire has socio demographic and economic conditions,

Obstetric and Gynecologic, Health and health related and health facility and mother's behavior. The questionnaire was adapted from reviewing different literatures and considering the local situation of the study (5, 7, 8, 11, 12, 15, 16). To assure its consistency, it was translated to Tigrinya and again translated back to English by different language experts. The data was collected by four (BSc) midwives and supervised by two MSc health professionals. Data collectors and supervisors had obtained two day training which was focused on the rational, objective, data collection instrument and handling of ethical issues of the study. Pretest was also done on 5% of the total sample size in Adigudom primary hospital. Based on the result, modifications have been done to portions of the tool. After the principal investigators checked on the daily activities of data collectors and supervisors, if any incomplete and unclearly questionnaires were given back to the interviewer and were completed to the questioner. After data collection, data was stored in a secured place to maintain confidentiality, and backup of the data was stored in different areas to not lose the data. Each questionnaire was coded, entered and cleaned separately before analysis.

Data analysis

The collected data was coded, entered, cleaned and analyzed using SPSS version 27. Descriptive statistics were used to describe puerperal sepsis. Frequencies and percentages were used to present categorical data. Variables with crude odds ratio (COR) $\leq$ 0.25 were entered to multivariate logistic regression analysis. Adjusted Odds ratios (AORs), 95% confidence intervals (CIs) and P-value were calculated using a logistic regression model to determine association levels of predictors to the outcome variables. Before inclusion of predictors to the final logistic regression model, the multi-collinearity was checked using variance inflation factor (VIF) <10.The VIF of this study was 2.9. The goodness of fit of the final logistic model was tested using Hosmer and Lemeshow tests at a value of > 0.05. Statistically significant variables were reported using adjusted odds ratio with 95% of confidence interval and P-value <0.05. Finally, results were presented using texts, charts and tables.

Operational definition

Puerperal sepsis is a reproductive tract infection that manifests as two or more of the following symptoms (if body temperature is greater than 38.5^{o}c, pelvic pain, abnormal genital tract discharge or pus, bad or foul smelling discharge and delay in reduction size of the uterus) after 24 hours of delivery and between 42th days of giving birth by senior decision and WHO definition (11).

Premature Rupture of Membrane (PROM): Spontaneous rupture of the membranes any time beyond the 28th week of pregnancy but one hour before the onset of labor (12).

Prolonged PROM: Is any premature rupture of membranes that persists $\geq$ 8 hours (5).

Postpartum: is a period which begins immediately after the birth of the baby and extends up to six weeks (42 days) after birth (11).

Result

The response rate of this study was 100% (n=368). The mean age of the study subjects was 27.31 and standard deviation ± 4.66) with 95% CI (26.834, 27.786). About ninety five (25.8%) of the mothers had collage & above, 87 (23.6%) of mothers were housewives and 359(97.6%) were ethnicities in the Tigray region. 327(88.9%) orthodox religion. The average estimated monthly income of the family in the study area was between < 5,000 Ethiopian birr (Table 1)

Table-**1** Socio-demographic characteristics of study participants admitted to public hospitals of Mekelle city, Tigray, Northern Ethiopia April to May 2025, (n=368).

Variable	Frequency (n)	Percentage (%)
Age		
15-19	52	14.1
20-29	160	43.5
30-45	156	42.2
Marital status		
Single	17	4.6
Married	341	92.7
Widowed	10	2.7
Residence		
Urban	277	75.3
Rural	91	24.7
Religion		
Orthodox	327	88.9
Muslim	32	8.7
Protestant	9	2.4
Ethnicity		
Tigray	359	97.6
Afar	9	2.4
Educational status		
No formal education	33	9.0
Primary school	84	22.8
Secondary school	99	26.9
Preparatory school	57	15.5
Collage and above	95	25.8
Occupation		
House wife	87	23.6
Governmental employee	99	26.9
self-employee	78	21.2
Merchant	104	28.3

Husband level of education		
No formal education	54	14.7
Primary school	98	26.6
Secondary school	49	13.3
Preparatory school	44	12.0
Collage and above	123	33.4
Husbands occupation		
Farmer	37	10.1
Governmental employee	202	54.9
self-employ	59	16.0
Merchant	70	19.0
Monthly income (in ETB)		
<5,000	184	50.0
5,001-10,000	112	30.4
>10,000	72	19.6

Obstetric and Gynecological factors:

Around 175(47.6%) of mothers were multipara, and three hundred sixty two (98.4%) of them had ANC follow up. More than seventy percent 263 (71.5%) of mothers had ANC follow up 7-8 contact and 81(22%) had 3-6 contact. A large number of 237 (64.4%) of mothers gave birth at a hospital while 115 (31.3%) gave birth at a referral hospital. The majority of the study participants 208 (56.5%) had less than 12 hour labor duration and 61(16.6%) of them stayed for 24 hour or more labor duration. Mothers interviewed 141 (38.3%) of them were experienced rapture of membranes eight hours or more before to give birth from the chart review.

Labor started spontaneously in 308(83.7%) of the respondents; 60(16.3%) were induced. Labor mothers during delivery per vaginal (PV) examination less than four times 295(80.2%) of the respondents 73(19.8%) were PV done four times or more (Table 2).

Table 2: Obstetric and Gynecological factors postpartum mothers admitted to public hospitals in Mekelle city, Tigray region, Northern Ethiopia, April to May 2025, (n=368).

Variable	Frequency (n)	Percentage (%)
Parity		
Primi	73	19.8
Multipara	175	47.6
Grand multiparty	120	32.6
Do have ANC contact		
Yes	362	98.4
No	6	1.6
Number of ANC contact in the last pregnancy		
1 contact	4	1.1
2 contact	17	4.6
3-6 contact	81	22.0
7-8 contacts	263	71.5
No follow up	3	0.8
Place of ANC follow up		
No follow up	3	1
Health center	49	13.1
Hospital	189	51.4
Referral hospital	105	28.5
Private	22	6.0
Place of delivered the last pregnancy?		
Health center	16	4.3
Hospital	237	64.4
Referral hospital	115	31.3
How was labour started your last pregnancy?		
Spontaneous	308	83.7
Induced	60	16.3
Duration of labor during the last delivery		
<12hrs	208	56.5

12-24hrs	99	26.9
≥ 24hrs	61	16.6
Number of vaginal examination during labor done by health professionals (n=360)		
< 4	295	80.2
≥ 4	73	19.8
Mode of delivery		
Spontaneous vaginal delivery	212	57.7
Assisted vaginal delivery	9	2.4
Caesarean section	147	39.9
Mode of delivery of the placenta		
Spontaneous	330	89.7
Manual	38	10.3
Did PPH developed during delivery		
Yes	18	4.9
No	350	95.1
Duration rapture of Membrane in hours		
< 8 hr	227	61.7
≥ 8 hr	141	38.3
Have you taken prophylaxis Antibiotic		
Yes	241	65.5
No	127	34.5

Magnitude of puerperal sepsis

Among the total number of 368 samples 58 (15.8%) (95% CI, 12.3-19.7) developed puerperal sepsis. Majority of the respondents were not heard about puerperal sepsis 189 (51.4%) (Figure 1)

Health facility related factors

Three hundred thirteen 313(85.1%) of women had access to transportation, ambulance, private and public cars. More than fourth –fifth 309(84.4%) of mothers observed a person assisting them used gloves and 30(9.6%) were washed and the other is 29(6%) they don't know. About 98 (26.6%) of postpartum mothers were more than 5km away from hospital. Among those mothers around,

355(96.5%) mothers had got immediate care during postnatal. 335(91%) of mothers said the bed linen was clean during postnatal. About 31(8.5%) mothers were given referral access during labor and postnatal. Among mothers discharged from hospital to home around 296(80.1%) mothers stay at hospital (1-3 days) (Table 3).

Table 3 Health facility related factors postpartum mothers admitted to public hospitals in Mekelle city, Tigray region, Northern Ethiopia, April to May 2025, (n=368).

Variable	Frequency (n)	Percentage (%)
Did got transportation access (ambulance, private, public)		
Yes	313	85.1
No	55	14…9
Had Immediate received care during delivery and postnatal		
Yes	355	96..5
No	13	3.5
The bed linen was clean during postnatal		
Yes	335	91. 0
No	33	9.0
Distance home to facility in km		
< 5 km	270	73.4
≥ 5 km	98	26.6
Did you referred to other hospital in your delivery		
Yes	31	8.4
No	337	91.6
Did you observed from care provider before examination and what type infection prevention mechanism used?		
Surgical glove	309	84.4
Hand wash	30	9.6
I don't know	29	6
Length of hospital stay (in days)		
1-3	296	80.1
4-10	62	16.8
>10	10	3.1

Factors associated with puerperal sepsis

To identify associated factors to puerperal sepsis, both bivariate and multivariable logistic regression analyses were used. The Bi-variate analysis result revealed that socio-demographic variables such as (Marital status, Educational status, Occupation, monthly income), obstetric profile variables such as

(parity, place of delivery, mode of delivery, premature rupture of membrane, duration of labor and number of vaginal examination) and health facility related variable distance from hospital and length of stay in hospital were significantly associated with puerperal sepsis. On the multivariable logistic regression, party, mode of delivery, prolonged premature rupture of membrane, and duration of labor were the factors that had a statistically significant association with puerperal sepsis at p- value <0.05.

Multi parous mothers were 8.9 times more likely to develop puerperal sepsis than grand multi parity mothers, with (AOR= 8.87, 95% CI, (3.691-21.321), primigravida (AOR=9.921, 95 % CI, 2.946 - 33.4). Spontaneous vaginal delivered mothers were 3.5 more likely to develop puerperal sepsis compared to mothers delivered by caesarian section, (AOR = 3.545, 95% CI: (1.636 - 7.68)

Mothers who delivered more than or equal to 8 hours rupture of membrane were 4.5 times more likely to develop puerperal sepsis compared to those who delivered less than 8 hours of rapture of membrane (AOR= 4.497, CI, (1.922-10.52). Mothers who waited on labor more than or equal to 24 hours were 4.46 times more likely to develop puerperal sepsis than mothers who stayed on labor less than 12 hrs. (AOR= 4.46, 95%, CI, (1.107-17.96) (Table 4).

Table 4: Bivariate and multivariate analysis for puerperal sepsis among postpartum women admitted to public hospitals of Mekelle city, Tigray region, Northern Ethiopia, April to May 2025. (n=368)

Variable	Puerperal sepsis		COR (95 CI %)	AOR (95 CI %)	p-value
	Yes	NO			
	n (%)	n (%)			
Marital status					
Single	2(11.8)	15(88.2)	1	1	
Married	52(15.2)	289(84.9)	0.74(0.17-3.34)	1.611(0.24-10.91)	0.625
Divorced	4(40)	6(60)	**0.2(0.03-1.39)***	1.56(0.123-20.84)	0.720
Educational status					
No formal education	5(15.2)	28(84.8)	1.4 (0.477-4.11)	1.445(0.362-5.766)	0.602
Primary school	16(19)	68(81.0)	0.985(0.474-2.05)	0.738(0.279-1.952)	0.540
Secondary school	11(11.1)	88(88.9)	**2 (0.896-4.467)***	1.615(0.559-4.66)	0.376
Preparatory school	6(10.5)	51(89.5)	**2.13 (0.8-5.685)***	2.109(0.576-7.731)	0.260
Collage and above	20(21.1)	76(78.9.)	1	**1**	
Occupation					
House wife	14(16.1)	73(83.9)	0.77(0.39-2.001)	0.876(0.311-2.469)	0.803
Gov,tal employee	22(22.2)	77(77.80)	**0.54(0.247-1.06)***	0.592(0.227-1.549)	0.286
self-employee	8(10.3)	70(89.7)	1.36 (0.54-3.42)	1.578(0.497-5.009)	0.439
Merchant	14(13.5)	90(86.5)	1	1	
Monthly Income					
100-5000	30(16.3)	154(83.7)	0.668(0.29-1.54)	1.34(0.438-4.098)	0.608
5000-10000	21(18.8)	91(81.2)	**0.54 (0.226-1.3)***	1.082(0.340-3.445)	0.894
>10000	7(9.7)	65(90.3)	1	1	
Parity					
Pirmgravida	4(5.5)	69(94.5)	**9.98(3.41-29.24)***	**9.921(2.946-33.4)****	0.000
Multi para	10(5.7)	165(94.3)			0.000

Grandmulti para	44(36.7)	77(63.3)	**9.55 (4.56-19.9)***	**8.87(3.691-21.321)****	
			1	1	
Place of delivery					
Health center	2(12.5)	14(87.5)	1.474(0.31-7.00)	1.457(0.226-9.415)	0.692
Hospital	36(15.2)	201(84.8)	1.17(0.65-2.139)	1.275(0.58-2.804)	0.545
Referral hospital	20(17.4)	95(82.6)	1	1	
Durations of labor in Hrs.					
<12	43(20.7)	165(79.3)	1	1	
12-24	12(12.1)	87(87.9)	**1.89(0.947-3.77)***	1.356(0.56-3.283)	0.499
>= 24	3(4.9)	58(95.1)	**5.04(1.51-16.86)***	**4.46(1.107-17.96)****	**0.035**
Number of VX examination					
<4	53(18)	242(82)	1	1	
>=4	5(6.8)	68(93.2)	**2.98(1.15-7.745)***	2.206(0.173-6.829)	0.170
Mode of delivered fetus					
Svd	17(8.0)	195(92.0)	**4.14(2.24-7.67)***	**3.545(1.636-7.68)****	**0.001**
Assist delivery	2(22.2)	7(77.8)	1.26(0.252-6.346)	0.879(0.129-6.219)	0.912
c/s	39(26.5)	108(73.5)	1	1	
Rapture of Membrane					
<8	47(20.7)	180(79.3)	1	1	
>= 8	11(7.8)	130(92.5)	**3.086(1.54-6.18)***	**4.497(1.922-10.52)****	**0.001**
Distance Home to Facility km					
<5	48(17.8)	222(82.2)	1	1	
>=5	10(10.2)	88(89.8)	**1.9(0.92-3.92)***	2.158(0.897-5.193)	0.086
Length of stay in hospital in day					

1-3					
4-10	47(14.8)	271(85.2)	1	1	
>10	10(23.8)	32(76.2)	**0.56 (0.26-1.2)***	0.687(0.241-1.956)	0.803
	1(12.5)	7(87.5)	1.21 (0.146-10)	1.43(0.087-23.646)	0.170

***=P-value ≤ 0.25, **= P-value <0.05, COR: Crude odd ratio, AOR: Adjusted odd Ratio**

Discussion

The magnitude of puerperal sepsis in this study was 15.8% with (95% CI, 12.3–19.7). The finding of this study was similar with the study conducted in Pumwani, Kenya and University of Gonder referral hospital states was 15%, and 17.2% respectively (11, 15). This similarity could be due to similar socio-demographic characteristics.

But lower than the study conducted at a Tertiary Referral Hospital in Western Uganda 24% (16), University Teaching Hospital of Kigali 33.9% (17), Fort-Portal Regional Referral Hospital, western Uganda 22.4% (7), Nepal 22.11% (18) and Hadya zone Ethiopia 20.6% (5). This difference might be attributed to the level of hygiene or practicing better infection preventative measures and better accessible maternal healthcare services in this study.

However, finding from this study is higher than the findings from studies conducted in New York America 7.9% (19), Ibadan Nigeria 0.83% (20), Usmanu Danfodiyo University Teaching Hospital, Sokoto Nigeria 0.9% (21), rural Nepal 7.5% (22), and Debre Markos comprehensive specialized hospital, northwest Ethiopia 7.27% (23). This might be due to the effect of the war-torn health care system in Tigray region and difference socioeconomic status, study duration, standards of obstetrics care for infection prevention.

In this study, factors associated with puerperal sepsis were, low party, mode of delivery (spontaneous vaginal delivery), prolonged premature rupture of membrane, and duration of labor. Multi parity postpartum mothers were 8.87 and primigravida 9.9 times more likely to develop puerperal sepsis than grand multi para-mothers. This finding was similar to the study done in Gonder, Ethiopia (11). The possible reasons are mothers with low parity had long course labor duration and inexperienced to the labor process and come early to health institutions due to not knowing the sign of labor. So they have frequent vaginal examinations and develop an ascending infection. But contradict with the study done in western Uganda (7).

Mode of delivery was significantly associated with PS. According to this study, spontaneous vaginal delivered mothers were 3.5 more likely to develop puerperal sepsis compared to mothers delivered by caesarian section. This finding was in line with the study done in Gonder, Ethiopia (11). The reason could

be the patient admitted in the hospital will have repeated vaginal examination which leads to ascending infection which is the risk factor for puerperal sepsis.

Mothers who delivered more than or equal to 8 hours rupture of membrane were 4.5 times more likely to develop puerperal sepsis compared to those who delivered less than 8 hours rapture of membrane. This study is in line with the study done in Ethiopia Gedeo Zone, Harar town, West Shoa Oromia (24–26). This could be due to allowing vaginal flora to ascend into the uterine cavity, leading to contamination for an extended period and further risk of intra uterine infection. Prolonged premature rupture of membrane often ends in induction, catheterization, instrumental delivery, or cesarean section, all of which increase infection risk.

Mothers who waited on labor more than or equal to 24 hours were 4.46 times more likely to develop puerperal sepsis than mothers who stayed on labor less than 12 hrs. This was similar to the study done in Tanzania (8), Ethiopia Gedeo zone, Hawassa city, Harar town, West Shoa Oromia (24–27). The possible reasons are frequent vaginal examinations during a long labor can introduce microorganisms from the hands, gloves, or vaginal flora into the uterus. Another reason is exhaustion, dehydration, and stress during prolonged labor can weaken the mother's immune defenses, making infection more likely. Prolonged labor often leads to procedures such as instrumental delivery, catheterization, episiotomy, or cesarean section, all of which can increase infection risk if bacteria enter tissues.

Conclusion

In the study area, puerperal sepsis remains an unresolved public health problem. The magnitude of puerperal sepsis in Mekelle city public hospitals was high. It was predicted by a number of factors, including low parity (primigravida, multi-parity), having prolonged labor, mode of delivery, and prolonged premature rupture of membranes (PROM) were significant factors for puerperal sepsis. Using aseptic techniques, awareness creation, using a partograph to avoid prolonged labor and giving antibiotics for PROM mothers are the crucial techniques to reduce puerperal sepsis. Additionally, the hospital needs to update its infection control protocols and inform health care providers of the risk factors that have been discovered. Puerperal sepsis features and severity

Abbreviations

ANC- Antenatal Care, AOR-Adjusted Odds Ratio, C/S - Cesarean Section, CI-Confidence Interval, MMR - Maternal Mortality Ratio, OR - Odds Ratio, PPROM- Prolonged premature Rupture of Membrane, PS- Puerperal Sepsis, SVD - Spontaneous Vaginal Delivery, VIF- variance inflation factor, WHO- World Health Organization

Declarations

Availability data and materials

The datasets used and/or analyzed during this study are available from the corresponding authors upon reasonable request.

Competing interests

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

Authors' contributions

SG and HG were investigators who contributed to the conception and design of the study, collected, entered, analyzed, and interpreted the data. DAW, SRA and MBM contributed to data analysis, interpretation and drafted the manuscript. DAW and HG were prepared the manuscript and also acted as corresponding authors. All authors read and approved the final version of the manuscript and agreed to publish it in this journal.

Ethics approval and consent to participate

Ethical approval was sought from Adigrat University College of Medicine and Health Science, and Health Research Ethics Review Committee (HRERC) and was granted accordingly with the reference number ADU.CMHS/HRERE/82/25. Official support letters were submitted to the study Hospitals. Informed written consent was obtained from each study participant. Participants were also informed that they are free to withdraw from the study at any time and their medical records were kept strictly confidential.

Consent for publication

Individual data such as images and videos did not accompany this particular manuscript and hence consent for publication is not applicable.

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Figures

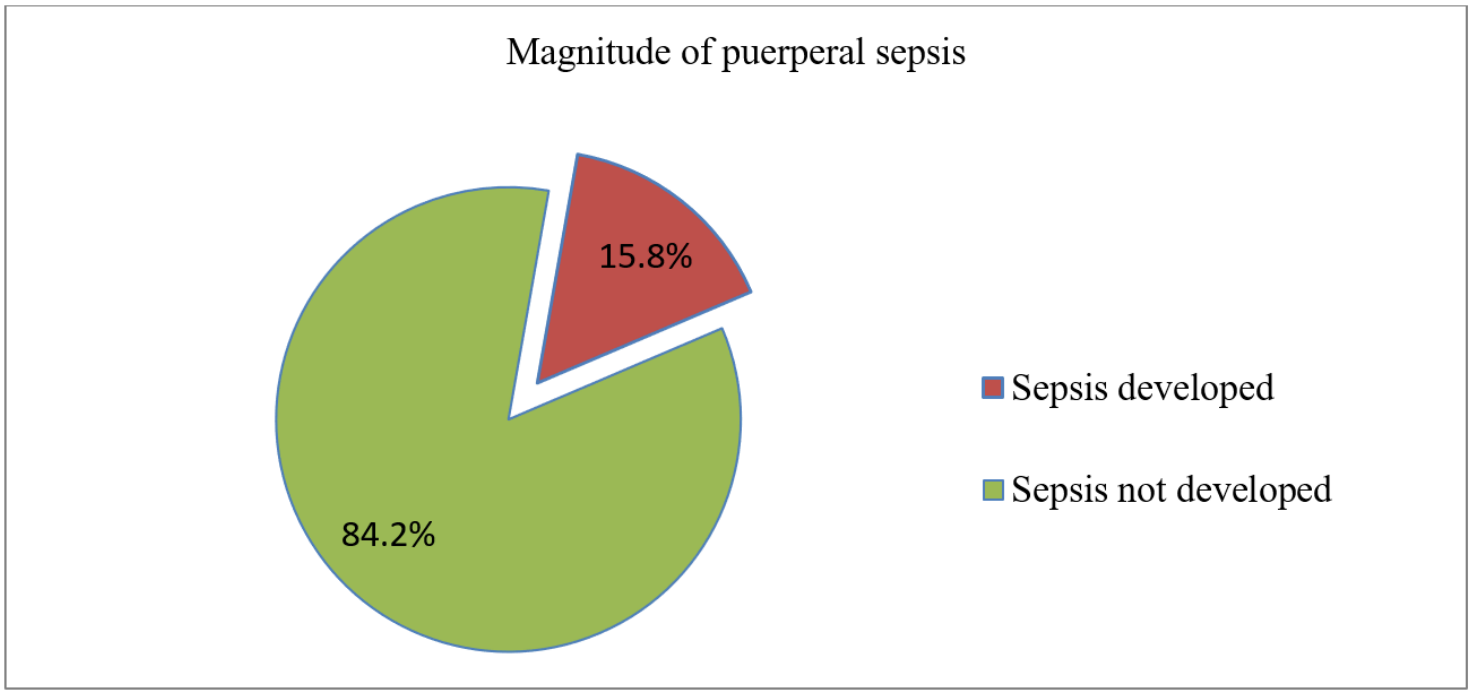


Figure 1

Magnitude of puerperal sepsis among women's admitted to public hospitals of Mekelle city, Tigray, northern Ethiopia, 2025(n=368)