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PREVALENCE AND OUTCOME OF OBSTRUCTED LABOUR AMONG MOTHERS WHO DELIVERED IN AYDER COMPRHENSIVE SPECIALIZED HOSPITAL, MEKELE, TIGRAY, ETHIOPIA

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Abstract

Obstructed labor (OL) is failure of descent of the fetus in the birth canal for mechanical reasons in spite of good uterine contractions which may result either due to factors in the fetus or in the birth canal or both, so that further progress is almost impossible without assistance. OL Is one of the leading causes of maternal mortality and morbidity in developing world including Ethiopia. The prevalence is more common in communities in which childhood malnutrition is dominant and where there is no easy access to functioning health facilities.

The objective of this study was to assess the prevalence and outcomes of obstructed labor among pregnant mothers delivered in Ayder comprehensive specialized Hospital (ACHS), Mekelle, Tigray. Hospital based retrospective cross-sectional study was conducted from May 2018- July 2018 in ACHS, MEKELLE, TIGRAY. Data was collected from patients' charts, Operation and delivery room registration books by using semi-structured pretested check list and checked, coded, entered to SPSS version 20 software and analyzed. All consecutive cases of obstructed labor managed in ACHS from January 2012- December 2017 selected as per the inclusion and exclusion criteria were taken.

RESULTS: The prevalence of obstructed labor was 0.9%. Cases of obstructed labor decreased over each year with the maximum (24.8%) number of cases seen in the year 2012 and minimum in 2017(10.6%). Majority (50%) of the cases were in the age range of 18-29 and primigravida (37.2%). 86.7% did have antenatal care follow-up. 90(79%) were referred from health centers and 87(50.4%) visited the hospital after at least 12 hours of labor. The mean distance from referring institution to ACHS was 51.9 kilometers and 89.4% came from a distance of 10 kilometer

and more. The causes of obstructed labor were malposition /malpresentation in 57 (50.4 %) and CPD in 51(45.1%) of the cases. Mode of delivery was LSCS in 110(97.3%) and destructive delivery was done for 2(1.8%) cases. All received broad spectrum antibiotics. The mean duration of catheterization was 6.26 days. The commonest maternal complications observed were sepsis/wound infection (18.6 %) and PPH (10.6%). There were 23(20.4%) stillbirths, 65(72.2%) of the live births had low first minute APGAR score and 8(8.9%) of them died within 10 minutes of life.

Conclusion The prevalence of obstructed labor was relatively low in the study area. Improved quality of antenatal care, referral system, and availability of comprehensive obstetric care in nearby health institutions are recommended to prevent obstructed labor and its complications.

Key words: prevalence, Obstructed labor, outcome

Introduction

Obstructed labor (OL) is failure of descent of the fetus in the birth canal for mechanical reasons in spite of good uterine contractions which may result either due to factors in the fetus or in the birth canal or both, so that further progress is almost impossible without assistance (1). A mismatch between fetal size, the size of the presenting part of the fetus, and the mother's pelvis, malposition such as occipito-posterior, malpresentations, such as brow presentation or shoulder presentation will cause obstruction. Pathological enlargement of the fetal head, as in hydrocephalus, may also obstruct labor. These different causes of dystocia (difficult labor) may co-exist (2,3).

Obstructed labor occurs when the presenting fetal part cannot pass through the maternal bony pelvis. The presenting part then becomes wedged against the maternal pelvic bones, compressing the soft tissues in between. The uterine contractions force the presenting part deeper into the pelvis, compressing the maternal soft tissues more forcibly. If this process is not relieved by surgical intervention the blood supply to the entrapped soft tissues becomes compromised, ultimately resulting in tissue death, fistula formation and nerve damage (4).

In low income countries maternal deaths due to pregnancy and chilled birth related complications are the major causes of death of women in the reproductive age group (5). Causes of maternal mortality are classified as direct and indirect each contributing to about 70%-80% and 20%-30% of the total maternal deaths respectively (6). Almost 99 %of maternal deaths occur in developing countries with more than half occurring in sub Saharan Africa (7)

The major causes of maternal deaths are similar across low income countries and are often of obstetric complications and generally follow obstructed labor with or without uterine rupture, hypertensive disorders of pregnancy (mainly severe preeclampsia and eclampsia) ,infection, and hemorrhage(placenta previa ,abruptio placenta, uterine rupture and PPH(6-9).

Obstructed labor is one of the most common causes of maternal morbidity and death in sub-Saharan Africa and Southeast Asia. Worldwide, obstructed labor occurs in an estimated 5 % of pregnancies and accounts for an estimated 8% of maternal deaths (2,10).

some of the causes, risk factors and outcomes of obstructed labor can be summarized with the figure below.

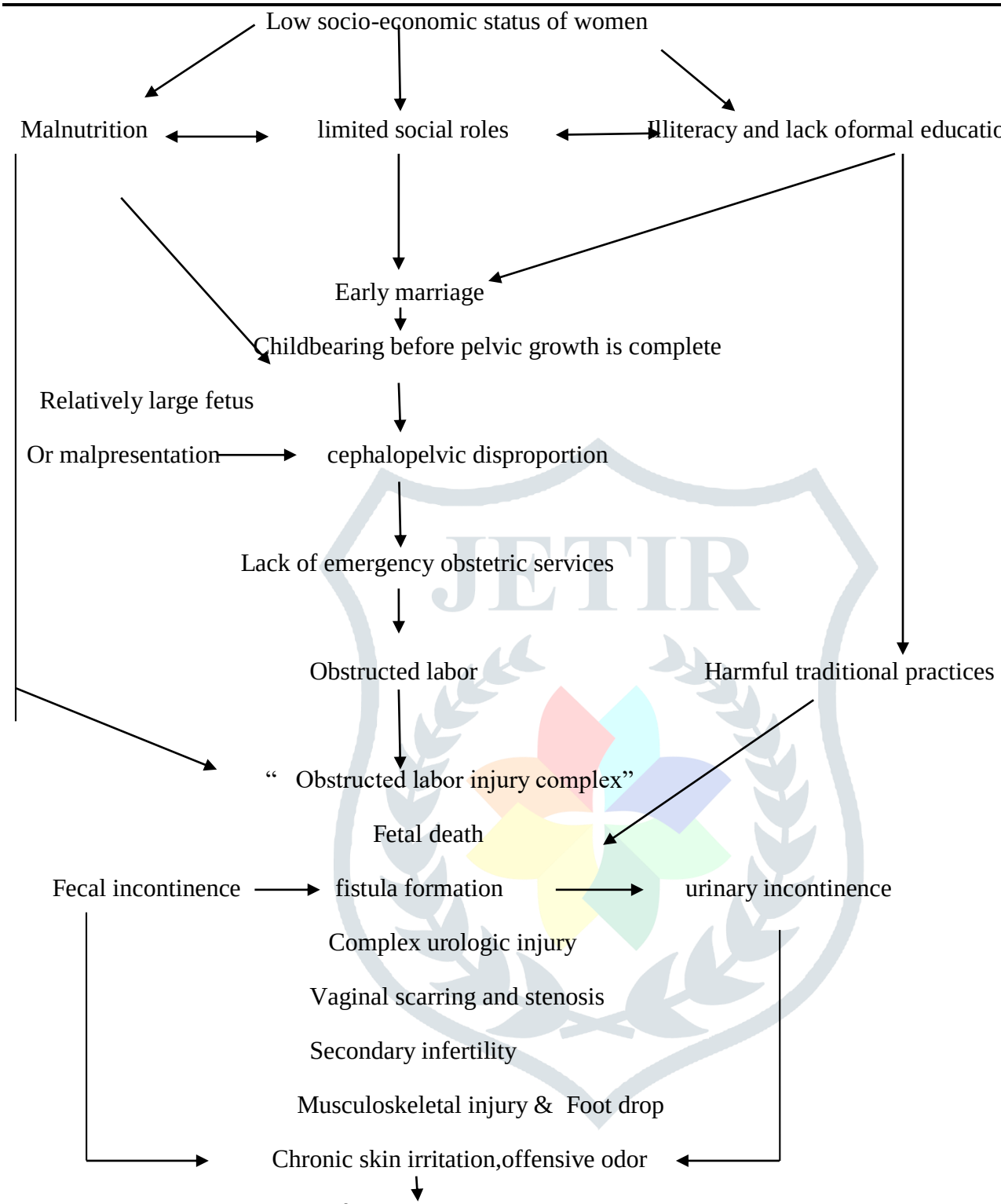


Figure1. Schematic presentation of some of the risks and outcomes of obstructed labor (4).

OBJECTIVES OF THE STUDY

General objective

To determine the prevalence and outcome of obstructed labor in ARH

Specific objective

1. To determine prevalence of obstructed labor in ARH
2. To determine maternal outcomes of obstructed labor among women delivered in ARH
3. To determine fetal outcomes of obstructed labor among women delivered in ARH

METHODS AND MATERIALS

A hospital based cross sectional study was conducted in ARH

Ayder Comprehensive Specialized Hospital provides a broad range of medical services (referral and non-referral) to both in and out patients of all age groups of about 8 million populations in its catchment area of Tigray, Afar and south- eastern parts of the Amhara regional states.

ACSH receives patients from different regional hospitals, health centers and from Afar and Amhara regional hospitals. Almost all of cases of obstructed labor being managed in ACSH are referred cases.

Inclusion criteria

- Mothers diagnosed to have OL or uterine rupture secondary to OL and managed in ARH during the specified time will be included

Exclusion criteria

- women with OL whose charts are inconsistent or incomplete
- women who were admitted to ARH post-partum

Sample size determination

ni = $\left(\frac{z\alpha/2)2p(q)}{d2}\right)$

n_i= initial sample

d= margin of error

z= confidence interval

p= prevalence of OL

q= 1-p

The prevalence of OL in ARH is not known before; Sample size is going to be determined by using 7.95 % prevalence according to the study done on the prevalence of obstructed labor among mothers delivered in Mizan-Aman General Hospital, South West Ethiopia from July 2014 back to September 2013and 95% confidence interval and 5% marginal error using the formula below

$n_i = \frac{(1.96)^2(0.0795)\ (1-0.0795)}{\quad} = 112$

$(0.05)^2$

Correction formula

N=average number of deliveries per month in ARH is 400

n =112

$N f = \frac{n}{1+ n/N}$

$1+ n/N=1.28$

$N f = \frac{112}{1.28}$

Nf= 88

All consecutive OL patients registered from January 2012 to December 2017 E.C. on the delivery and emergency registration books and OR log books were included

Operational Definitions:

Obstructed labor: Obstructed labor is a phenomenon that despite adequate uterine contractions the delivery of the baby could not be accomplished timely in a normal, natural fashion for mechanical reasons but active intervention by health professionals will be needed (22).

Case of obstructed labor: patients with assessment of obstructed labor or uterine rupture secondary to OL on their charts or as post-operative diagnosis in the operation note with the following physical findings was taken

Physical findings

- Maternal exhaustion, anxiety, confusion, or unconsciousness
- Shock with rapid and weak pulse which may be due to both bleeding, sepsis and pain
-Fever, rapid respiratory rate, Dehydration (sunken eyes, thirsty, dry mouth, dry skin)
-Anemia(hgb<11)
- Abdominal findings
  -Three tumor abdomen formed by grossly thickened and retracted upper uterine segment above Band's ring; thinned out distended lower uterine segment below the ring and Fully distended or/ and edematous bladder
  -Palpable defect on the uterus with easily palpable fetal parts and abdominal tenderness with or without signs of fluid collection.
- Vaginal examination revealing;

- Foul-smelling meconium and dry vagina

-Edema of the vulva and cervix following prolonged pushing down and labor

-Depending on the cause of the obstruction, there may be:

-Large caput succedaneum and grade III molding in CPD, Shoulder with or without prolapsed arm, Brow or Face presentation in mentoposterior

Antenatal follow up – booked: when the mother reported that she had visited any health institution during her recent pregnancy at least once

Prevalence of obstructed labor: is the number or percentage of cases of obstructed labor divided by the total number of deliveries, in the facility, over the specified time frame.

Partograph: indicated a graphical representation of the dilatation of the cervix against time with an alert and an action line based on cervical dilatation of 1 cm/hr. between 4 and 10 cm

Multigravida: mother at least one previous delivery past 28 completed weeks of pregnancy

Grand multipara: five and more previous deliveries past 28 completed weeks.

Destructive delivery: A procedure which aims at reducing the size of the head, shoulder girdle or trunk of the dead fetus to allow its vaginal delivery.

Perinatal mortality: refers to a still birth or neonatal death within one week of life

Maternal outcome: Uterine rupture, PPH, sepsis, wound Infection, Fistula

Fetal outcome: stillbirth, Low APGAR score, Early Neonatal Death

Early Neonatal Death: Death of neonate within 10 minutes of life

Low APGAR score: first- and fifth-minute Apgar score less than 7.

Inconsistent or incomplete data-: patients charts with either lost history, operation or delivery notes or unrelated history or physical findings

Data collection tools and technique

Information extraction form was used to take information (regarding sociodemographic factors, obstetric factors and health care factors) from the patient's medical records, Operating theatre records, and delivery and emergency registration books.

Information extraction form was pre- tested by taking 2 percent of the minimum calculated sample size and necessary modification in the questionnaire was made based on the nature of information documented on the patient's charts, operation and delivery registration books.

The investigator supervised data collectors on daily basis and data was reviewed and checked for completeness, accuracy and consistency, corrective discussions were undertaken with data collectors.

After data collection, each form was checked for completeness, consistency and clarity and was coded, entered in to the prepared template and rechecked for errors. Data was entered into Epidata, and exported to SPSS version 22. Data was cleaned and explored for outliers, missed values and any inconsistencies and analyzed using SPSS version 22. Descriptive statistics like frequency tables, graphs and descriptive summaries were used to describe the study variables**.**

Ethical Approval was obtained from Institutional Review Board of Mekelle University, College of Health Sciences, and Permission was taken from the Medical Director of Ayder Comprehensive Specialized Hospital.

Result and Discussion

A total of 14,704 hospital-deliveries were conducted from January 01, 2012 to December 30, 2017. Among them, 160 cases of obstructed labor were recorded giving a prevalence of 1.09 %. In this study, 28 patients had incomplete, inconsistent or lost medical records and were not included in further analysis. Cases of obstructed labor decreased over each year with the maximum (22.7%) no of cases seen in the year 2012 and minimum in 2017(10.6%).

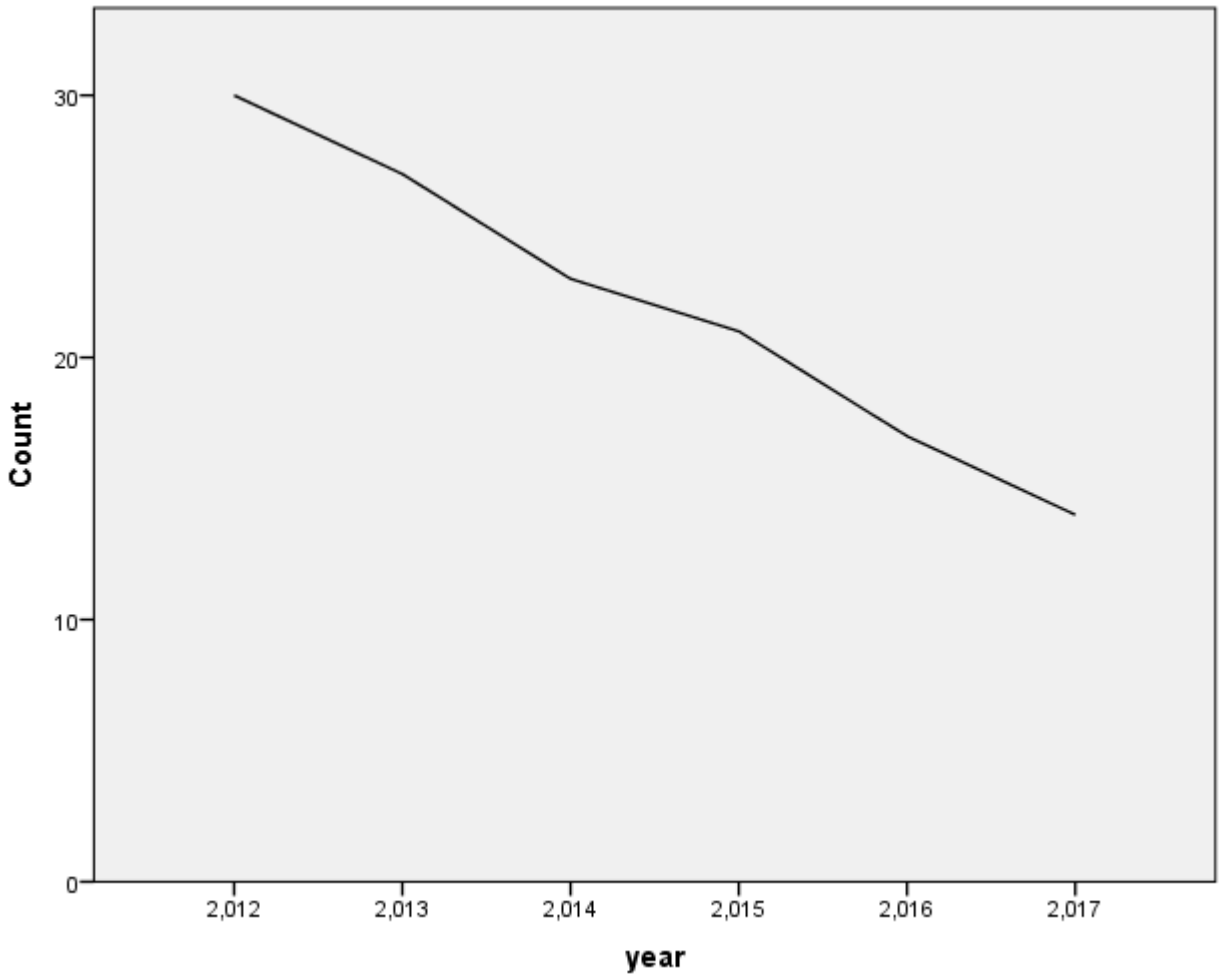


Figure 2. Distribution OL cases managed in ACHS over each year

Sociodemographic characteristics

Majority (48%) of the cases were in the age range of 18-29, 32% from 30-35, 4.5 % were teenagers and 15% were above 35. About 90.9 % were from Tigray region and the rest 9.1% were from Afar. 83.3% were from rural and the rest 16.7% were from urban area.

Table 5-1: Sociodemographic characteristics of OL cases who gave birth in Ayder referral hospital, Tigray, Ethiopia; 2012-2017

Category	Frequency	Percentage
Age		
≤18	6	4.5
19-29	64	48.5
30-35	42	32
>35	20	15
Region		
Tigray	120	90.9
Afar	12	9.1
Residency		
Rural	110	83.3
Urban	22	16.7
Year		
2012	30	22.7
2013	27	20.5
2014	23	17.4
2015	21	15.9
2016	17	12.9
2017	14	10.6

Obstetric History

37.8 % of the cases were primigravida, and 26.5 % were grand multipara. majority (84.8%) were booked and 14.4% were not booked. 50.8% had known LNMP and 80.5% of them were term. More than half of the cases (53%) were in labor for 13-24 hours and 24.3 % had labor for more than 24 hours.

Table 5.2. Obstetric history of OL cases who gave birth in Ayder referral hospital, Tigray, Ethiopia; 2012-2017

Category	Frequency	Percentage (%)
Parity		
Para 0	50	37.8
Para 1-4	47	35.6
Para ≥5	35	26.5
ANC		
Booked	112	84.8
Unbooked	19	14.4
No data	1	0.8
LNMP		
Known	67	50.8
Un known/unreliable	65	49.2
Gestational age		
Term	54	80.5
post term	10	15
Pre-term	3	4.5
Duration of labor		
≤12	30	22.7
13-24	70	53
25-72	29	22
>72	3	2.3

Cause of obstruction and intervention done

Malposition/malpresentation was identified as a cause in 63(47.7%) followed by CPD 60(45.5%) and fetal congenital malformations 6(4.5%). Cesarean section was done for 113(85.6%) patients, destructive delivery was done for 3(2.3%), total abdominal hysterectomy for 10(7.6). subtotal hysterectomy for 2(1.5) and repair with bilateral tubal ligation was done for 4 (3%). All patients received broad spectrum antibiotics for seven days. The mean duration of catheterization was 6.5 days with minimum of 2 days and maximum of 15 days and 63(47.7 %) of the cases stayed in the hospital for more than 7 days.

Table 5-3: Distribution of causes and intervention made for cases of obstructed labor, Ayder referral hospital, Tigray, Ethiopia; 2012-2017

Category	Frequency	Percentage (%)
Cause		
Malposition/malpresentation	63	47.7
CPD	60	45.5
Congenital malformation	6	4.5
No data	3	2.3
Interventions		
Cesarean section	113	85.6
Total abdominal hysterectomy	10	7.6
Subtotal abdominal hysterectomy	2	1.5
Destructive delivery	3	2.3
Repair	4	3
Duration of hospital stay		
≤3 days	2	1.5
4-7 days	67	50.8
8-14 days	35	26.5
>14 days	24	18.2
No data	4	3

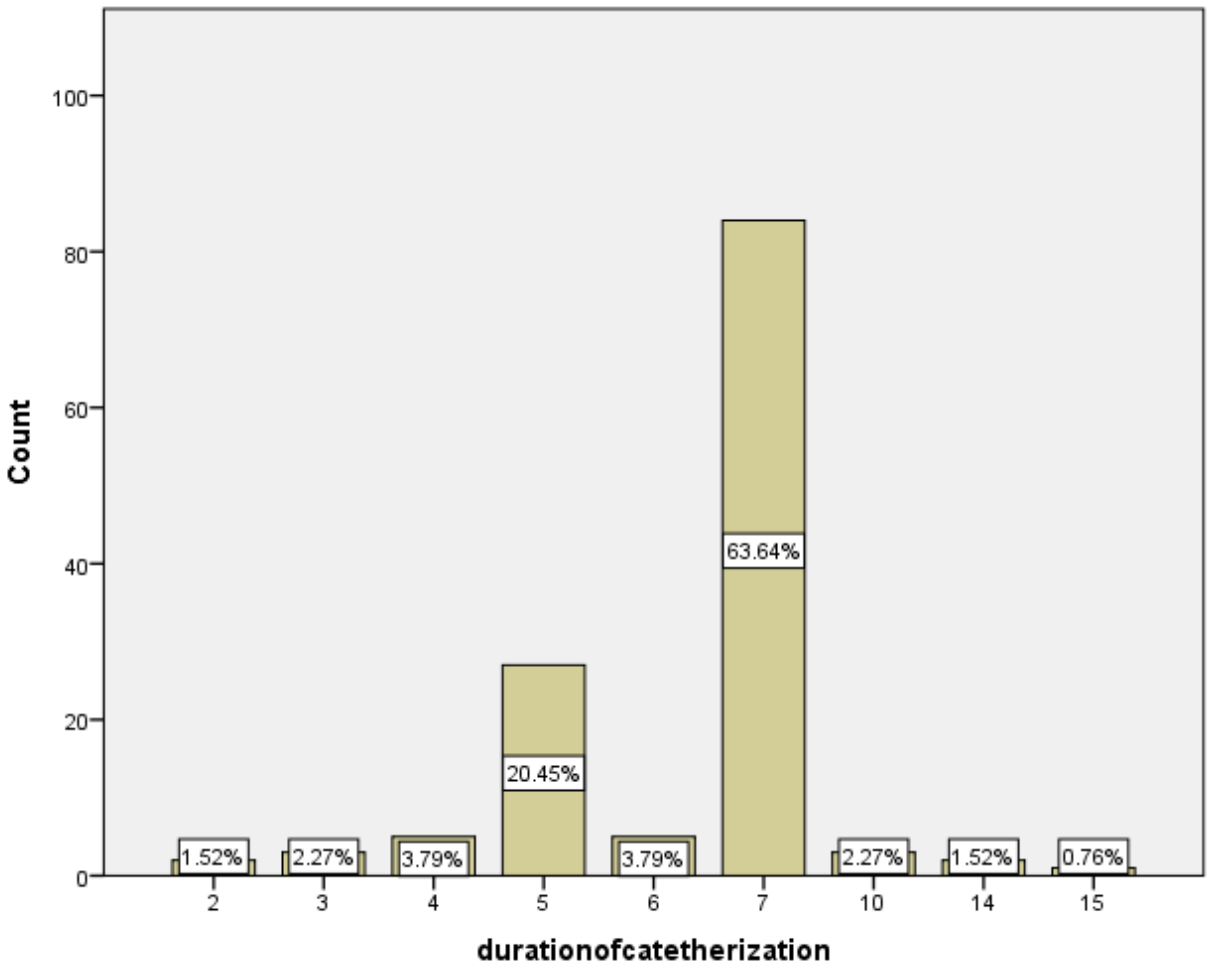


Figure 3. percentage distribution of duration of catheterization

Fetomaternal Outcome and complications

There were 44(33.3%) patients with complications; sepsis/wound infection (21.2%), postpartum hemorrhage (15 %), uterine rupture (12.1%) fistula (3.8%) and others like foot drop, abdominal distension and uterine incision extension accounted 4.5%; while 66.7% were discharged without complication.

36(27.3%) patients had absent fetal heartbeat at presentation. From the 96 patients who presented with positive fatal heartbeat 31.6 % had fetal heart rate abnormality (15.6 % fetal bradycardia& 15.6% fetal tachycardia).69(72.6%) had first minute APGAR score of ≤6 and 30(31.6%) had fifth minute APGAR≤6 and there were 10(10.4%) early neonatal deaths, perinatal mortality was 46 (34.8%).77(58.3%) were male 49(37.1%) female and 4.5 % had no documentation of sex. The mean fetal weight was 3.5 kilograms with minimum and maximum of 1.5 and 5.5 kilograms respectively.

Table 5.4: Distribution of outcome and complication of obstructed labor, Ayder referral hospital, Tigray, Ethiopia; 2012-2017

Category		Frequency	Percentage
Maternal Complication			
Sepsis/wound infection		28	21.2
Post-partum hemorrhage		20	15
Uterine rupture		16	12.1
Vesico vaginal Fistula		5	3.8
Others		6	4.5
Fetal outcome			
Stillbirth		36	27.3
1st minute APGAR	≤6	69	72.6
	≥7	26	27.1
5th minute APGAR	≤6	30	31.6
	≥7	64	67.3
ENND		10	10.4

Health care characteristics

Majority (97.7%) of cases of obstructed labor were referrals from nearby health centers and hospitals. 106(80.3%) were referred from health center, 23(17.4%) were referred from nearby hospitals, and 3 (2.3%) came directly from home. All of the referred cases had neither attached partograph nor documentation on use of partograph on their referral paper. The mean distance from referring institution to Ayder referral hospital was 51.6 kilometers with minimum of 0.5 kilometer and maximum of 120 kilometers .89.4% came from a distance of 10 kilometer and more.

Table 5-5: Distribution of health care character of obstructed labor in Ayder referral hospital, Tigray, Ethiopia; 2012-2017

Category	Frequency	Percentage (%)
Source of referral		
Health center	106	80.3
Hospital	23	17.4
Self-referred	3	2.3
Distance from ARH		
<10	14	10.6
10-50	53	40.2
51-100	55	41.7
>100	10	7.6

Discussion

This study had tried to look at the prevalence, causes and outcomes of obstructed labor. It showed the burden that it could bring to the health service, the community and the country in general. Outcomes like complications on the mother and on the fetus including perinatal mortality are assessed.

The study revealed that the prevalence of obstructed labor very much lower as compared to the previous studies conducted in Jimma University Specialized Hospital, Mizan Aman General Hospital, Metu Karl hospital and Adigrat hospital which were 12.2% ,7.95% ,4.1 and 3.3 respectively (21). It is also lower than what other studies found in other African and Asian countries like Nigeria (4.2%), Pakistan (3.61% &5.2%). The finding was close to the studies done in kassala hospital, Sudan (0.9%) and India (1.11%).

Our hospital-based data may underestimate the actual prevalence of obstructed labor because it is tertiary hospital and numbers of pregnant women being referred to our hospital for emergency surgery; be it for cesarean section or laparotomy may be decreasing since the deployment of integrated emergency surgical officers in some of the nearby hospitals. In a study done to evaluate the clinical performance of emergency surgical officers (ESO) in southern Ethiopia, a total of 4075 obstetric and surgical operations were performed in the study hospitals. of which 93 % were done on emergency base . Of the total emergency procedures 3570 (94%) were done by ESOs and 63 % of all the emergency operations were cesarean sections done by ESOS and concluded that deployment of ESO made the emergency surgery services accessible to the majority (23).

In this study the majority of cases of obstructed labor (48.5%) were recorded in the age group 19-29 years which is comparable to research conducted in Jimma University Specialized Hospital, MizanAman hospital, Adigrat General Hospital, Pakistan Public Sector University, regarding to parity and residence, most of the women who were victims of obstructed labor were primigravida (37.8%) and from rural area (83.3%). This finding is comparable with the study conducted in Jimma University Specialized Hospital, MizanAman hospital, Adigrat General Hospital. This high prevalence of obstructed labor among primigavida clearly indicates that childhood malnutrition and early marriage remain as major problem of the country. Similarly, higher prevalence of obstructed labor among rural resident may be linked with the delay at reaching health facility.

In this study, the prevalence of obstructed labor was higher among women who had ANC follow up (84.8%). This is different with researches held in Jimma University Specialized Hospital, Mizanaman and Adigrat General Hospitals [15,16]. But it is close to a study done in Metu Karl hospital where majority (57%) had ANC follow up. The result was consistent with the EDHS 2016 report of ANC coverage in Tigray (90%) (23). Even though ANC is a poor measure to prevent pregnancy and delivery complications, this finding reflects the gap in proper counseling and awareness creation of mothers during ANC about place of delivery , importance of delivery in a health institution and early visit in labor.

Most of the cases had labor for more than twelve hours (77.3%) which is close a finding in Jimma university specialized hospital (89.4%).

In this study Malposition/malpresentation was the major cause of obstructed labor (47.7%) which was comparable to the studies conducted in Nigeria where both malposition and malpresentation accounted for 50.5%.but much higher from studies done in Jimma University Specialized Hospital (27.4%) and Adigrat General Hospital (21%).

was also higher than the report from Pakistan Public Sector University, Khyber Teaching Hospital and Jhalawar Medical Collage (43.3%, 45.5% and 30% respectively).

In this study cephalo-pelvic disproportion (CPD) was the second common cause of obstructed labor (45.5%) which was comparable to the studies conducted in Nigeria (47.5%) but lower than that of Jimma University Specialized Hospital, Adigrat General Hospital, and Mizanaman General Hospita(67.6%, 64.9%, 66.67%, respectively). This can be due to variation in case definition as in this study patients even with clinical findings of CPD with the cause for CPD being malpositions were grouped as malposition/malpresentation .contracted pelvis common in developing countries due to childhood malnutrition and early marriage can also be a risk factor for malpositions and malpresentations.

Fetal congenital anomaly was the least common cause of obstructed labor (4.5%). This was higher than reports from Jimma University Specialized hospital (3.4%) and Adigrat General Hospital (2.1%) but lower than Mizanaman General hospital (8.8%).

Cesarean section was the commonest mode of delivery (85.6%) which was close to the finding of study done in kassala hospital (95.2%) but higher than studies done in Jimma university specialized hospita(54.7%), Adigrat General Hospital (46.1%) and Mizanaman General hospital (58.33%). Rate of destructive delivery (2.3%) was much lower than that of Jimma university specialized hospital (12.8%), Adigrat General Hospital (16.2%) and Mizanaman General hospital (8.33%).

33.3 %of patients had complications; sepsis and wound infection (21.2%) was the most common complication which is consistent with the study done in Metu karl hospiatal and a government medical collage Jhalawar Rajasthan India where sepsis and wound infection were found to be leading maternal complications. This may be due to their late arrival to the hospital after prolonged labor and prolonged rupture of the membranes with or without chorioamnionitis.

All patients in this study received broad spectrum antibiotics for seven days course. Post-partum hemorrhage accounted for 15 %, uterine rupture (12.1%) and there were 5(3.8%) cases of vesicovaginal fistulas.

The mean duration of catheterization was 6.26 days with minimum of 2 days and maximum of 10 days and there are no studies or standard recommendations on duration and effectiveness of catheterizing the urinary bladder for prevention of obstetric fistula following prolonged obstructed labor.

No maternal death was reported in this study as in a study done in Pakistan tertiary care hospital.

The study also showed obstructed labor to be one of the major causes of poor perinatal outcome with occurrence of stillbirth in 20.4% low first minute APGAR score in 72.2% of cases , low fifth minute APGAR in 27.8% and perinatal mortality of 27.4%.Lowfirst minute APGAR score was higher than the study done in Jimma University Specialized Hospital(45.8%) and government medical collage Jhalawar Rajasthan India(55.1%). Stillbirth rate was lower than studies done in Metu Karl Referal Hospital (35.1%) and Adigrat zonal hospital (50.3%). The perinatal mortality was consistent with the study done in Nigeria (24.76%) but lower than that of Adigrat zonal hospital (55.5%). This relatively lower perinatal mortality may be due lack of data of the neonates who were admitted to

NICU. The 8 early neonatal deaths were taken from the operation notes documented as zero fifth- and tenth-minute APGAR scores.

Majority (79.6%) of the referrals were from health center and 89.4 % of the patients had to travel 10 kilometers and more to reach to ARH which are consistent with the study of Jimma University Specialized Hospital where 81 % were referred from health centers and 95% of them travelled 10 kilometers and more to JUSH.

Limitation of the study

This study was retrospective, quantitative and hospital based. Since it was performed at only one selected site this might not have estimated accurately the actual prevalence of obstructed labor

As the study design was retrospective, the issues of missing or not recorded variables in patients' files, ANC cards and operating theatre as well as other confounding factors might have caused some potential bias.

Conclusion and Recommendation

This study revealed that there was low prevalence of obstructed labor as compared to the available local studies with declining pattern throughout the study period which can be due to improved ANC coverage in Tigray (90%) as per EDHS 2016 and deployment of Emergency Surgical Officers since 2013. Malposition/ malpresentation was the main causes of obstructed labor, especially in primigravids. This may indicate that contracted pelvis which is a risk factor for malposition/malpresentation and a result of childhood malnutrition and early marriage was contributing to the problem .even though ANC is a poor measure to prevent pregnancy and delivery complications, high rate of ANC follow up among women with obstructed labor reflects the gap in proper counseling and awareness creation of mothers during ANC about place of delivery, importance of delivering in a health institution and early visit in labor.

In order to avoid obstructed labor and alleviate problems associated with it, list of efforts are required; Creating awareness about hazards of early marriage, home delivery and benefits of health-facility delivery, awareness on birth preparedness and complication readiness including early sign of true labor at the community level and ANC.

Regional health bureau should ensure that there is access to functioning emergency obstetric care (EmOC), both basic and comprehensive, facilitate transport, train all health care workers involved in maternity care in skills of safe labor practices, use of and interpretation of the partograph and early referral.

ACSH &OB/GYN department in collaboration with regional health bureau should develop standardized guide line on detection and management of abnormal labor and CPD, and prevention of obstructed labor and provide to health professionals working in maternity care units of surrounding health institutions.

ACSH with OB/GYN department should develop a history taking format with all information which is important, such as Socio demographic data (educational status, monthly income, etc), obstetric variables and so on, so that it will provide complete information for scientific studies.

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ACRONYM

ANC	Antenatal Care
APH	Antepartum Hemorrhage
APGAR	Appearance, Pulse, Grimace, Activity and Respiration
ACSH	Ayder Comprehensive Specialized Hospital
CPD	Cephalopelvic disproportion
CS	Cesarean Section
CHS	College of Health Sciences
END	Early Neonatal Death
FHR	Fetal heart rate

IUFD	Intrauterine fetal death
NICU	Neonatal intensive care unit
NRFHRP	Non reassuring Fetal Heart Rate Pattern
OBGYN	Obstetrics and Gynecology
OL	Obstructed labor
PPH	Postpartum Hemorrhage
ROM	Rupture of Membranes
WHO	World Health Organization