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# Perinatal Outcome and Associated Factors Among Women With Trial of Labor After Cesarean Delivery in Public Hospitals in Bahir Dar City, Northwest Ethiopia, 2023

Biyadgie, Aschale

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**BAHIR DAR UNIVERSITY**

**COLLEGE OF MEDICINE AND HEALTH SCIENCES, SCHOOL  
OF MEDICINE, DEPARTMENT OF OBSTETRICS AND  
GYNECOLOGY**

**PERINATAL OUTCOME AND ASSOCIATED FACTORS AMONG  
WOMEN WITH TRIAL OF LABOR AFTER CESAREAN DELIVERY IN  
PUBLIC HOSPITALS IN BAHIR DAR CITY, NORTHWEST ETHIOPIA,  
2023**

**By: BIYADGIE ASCHALE (MD, OBGYN RESIDENT)**

**AUGUST, 2023**

**BAHIR DAR ETHIOPIA**

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By: BIYADGIE ASCHALE (MD, OBGYN RESIDENT)

A THESIS SUBMITTED TO DEPARTMENT OF OBSTETRICS AND  
GYNECOLOGY, SCHOOL OF MEDICINE, COLLEGE OF MEDICINE AND  
HEALTH SCIENCES, BAHIR DAR UNIVERSITY IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR SPECIALITY  
CERTIFICATE IN OBSTETRICS AND GYNECOLOGY

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AUGUST, 2023

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Bahir Dar, Ethiopia

## Declaration

This is to certify that the thesis entitled on perinatal outcome and associated factors among women with TOLAC who gave birth at public Hospitals in Bahir Dar city, North West Ethiopia: cross-sectional study, submitted in partial fulfillment of the requirements for specialty certificate in Obstetrics and Gynecology Bahir Dar University, is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Dr Biyadgie Aschale

\_\_\_\_\_

\_\_\_\_\_

Name of the candidate

Date

signature

APPROVAL OF DISSERTATION

I hereby certify that I have supervised, read and evaluated this thesis titled “on perinatal outcome and associated factors among women with TOLAC who gave birth at public Hospitals in Bahir Dar city, North West Ethiopia: cross-sectional study” by Dr. Biyadgie Aschale Alamneh prepared under my guidance. I recommend the thesis be submitted for oral defense.

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APPROVAL OF DISSERTATION

BAHIR DAR UNIVERSITY

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OF LABOR AFTER CESAREAN DELIVERY IN PUBLIC HOSPITALS IN BAHIR DAR  
CITY, NORTHWEST ETHIPIA, 2023

Approval of Dissertation/thesis for defense result

As members of the the board of examiners, we examined this dissertation/thesis entitled  
“Perinatal Outcome and associated factors among women with trial of labor after cesarean  
delivery in Public Hospitals in Bahir Dar City, Northwest Ethipia ” by Biyadgie Aschale, We  
hereby certify that the thesis/dissertation is accepted for fulfilling the requirements for the award  
of the degree of “Speciality in Obstetrics and Gynecology”.

Board of Examiners

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## Abstract

**BACKGROUND:** Caesarean section is one of the commonest operations performed on childbearing women, with rates continuing to rise worldwide. For the parturient who has had one previous caesarean delivery there are basically two options, trial of labor after Cesarean section or elective repeat caesarean section. Trial of labor after Cesarean section provides women who desire a vaginal delivery the possibility of achieving vaginal birth after cesarean delivery. In different ways both of these confer a degree of perinatal morbidity, and rarely mortality.

**OBJECTIVE:** To assess perinatal outcomes and associated factors among women with Trial of Labor after Cesarean Delivery who gave birth at public Hospitals in Bahir Dar city, Northwest Ethiopia, 2022/23

**METHODS:** A cross-sectional study was conducted among 120 mothers who came for labor and delivery service from April 01/2023 to June 30, 2023 in public hospitals at Bahir Dar city. Study subjects were selected using systematic random sampling method. Data was collected using interviewer administered pre tested questionnaire and checklist. Data were entered, cleaned, coded and analysis by using SPSS version 25 statistical software.. All variables with p-value<0.05 in the multiple logistic regression were considered statistically significant.

**RESULTS:** Of the total of 120 participants who underwent TOLAC were participated and the chart reviewed, giving a response rate of 100%. The unfavorable perinatal outcome of labor among respondents who had trial of labor after cesarean section was 18(15.0%). Among women with trial of labor after cesarean section unfavorable perinatal outcome were more likely among women with rural Place of residence (AOR=9.98; 95% CI: (2.91-34.23), prolonged duration of labor (more than mean) (AOR=6.23; 95% CI: (1.67, 23.22) and Failed TOLAC(AOR=94.4; 95% CI: (1.17, 16.49).

**CONCLUSION:** The unfavorable perinatal outcome of labor among respondents who had trial of labor after cesarean section was 18(15.0%). Place of residence, duration of labor and failed TOLAC was found to have significant association with unfavorable perinatal outcome. Our results showed that unfavorable neonatal outcome were higher in failed trial of labor after cesarean section.



**Keywords:** Trial of labor after cesarean section, Perinatal outcome, successful VBAC

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## ACRONYMS AND ABBREVIATIONS

ACOG =American collage of Obstetricians and Gynecologists

AOR =Adjusted Odds Ratio

APGAR=A score for the new born based on appearance, heart rate, grimace, activity (movement) and respiration

CI =Confidence Interval

COR =Crude Odds Ratio

CS= Cesarean Section

APH =Antepartam Hemorrhage

FHCSH = Felege Hiwot Comprehensive Specialized Hospital

FMoH = Federal Ministry of Health

IUGR = Intrauterine Growth Restriction

NICU =Neonatal Intensive Care Unit

MSAF= Meconium Stained Amniotic Fluid

NRFHRP= Non Reassurance Fetal Heart Rate Pattern

PIH =Pregnancy Induced Hypertention

PROM= Premature Rupture Of Membrane

TGSH= Tibebe Ghion Specialized Hospital

WHO= World Health Organization

TOLAC=Trials Of Labor After Cesarean

VBAC=Vaginal Birth After Cesarean Section

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1 Background

Caesarean section is one of the commonest operations performed on childbearing women, with rates continuing to rise worldwide. For the parturient who has had one previous caesarean delivery there are basically two options, trial of labor after Cesarean section (TOLAC) or elective repeat caesarean section (ERCS). Trial of labor after cesarean delivery (TOLAC) refers to a planned attempt to deliver vaginally by a woman who had a previous cesarean delivery, regardless of the outcomes. TOLAC provides women who desire a vaginal delivery the possibility of achieving vaginal birth after cesarean delivery (VBAC) [1].

Vaginal birth after caesarean section (VBAC) rates vary significantly from one country to another, ranging from 9.6%-52.2% in the developed world. These attempts were highly successful rates of VBAC increased from 3.4% to 28.3%, along with a concomitant decline in total cesarean delivery rates for the United States[2, 3].

In different ways both of these confer a degree of perinatal morbidity, and rarely mortality. The risks of VBAC include increased risk of asphyxia or perinatal death. The risks are lowest with successful VBAC but unfortunately none of the existing VBAC screening tools provide consistent ability to identify women who may achieve this. Fetal/neonatal risk factors include NICU admission, reduced APGAR scores, neonatal respiratory complications, hypoxic ischaemic encephalopathy, injury sustained during vaginal/caesarean delivery including fracture or trauma to the face or scalp, intrapartum fetal demise and neonatal death[4].

In Ethiopia, magnitude of perinatal outcome after trial labor were not clearly known. There are only a few studies on TOLAC and Feto-Maternal outcome. A study done in Addis Ababa University Teaching Hospital[5] and Attat Lord Merry Primary Hospital in Gurage Zone, the successful rate of VBAC among these participants were 60.5% and 44.5% respectively. In Attat Lord Merry Primary Hospital in Gurage Zone, Majority of neonatal birth weight and first minute APGAR score were between 2500-4000 gm 161(95%), 127(75.1%) of neonate with 1<sup>st</sup> minute

APGAR score of  $\geq 7$ , 13(7.7%) neonate APGAR score  $< 7$  at 5<sup>th</sup> minute, and 3(1.8%) fetal death [6].

## 1.2 Statement of the problem

Globally more than 5 million perinatal deaths occurring each year, ending preventable stillbirths and neonatal deaths will continue to form a significant part of the international public health agenda beyond 2015[7]. The Perinatal Mortality Rate (PMR) of Ethiopia was among the highest in Sub Saharan Africa and the trend has been stable between 90 and 40 per 1000 total births[8]. Globally, approximately one-quarter of all newborn deaths are caused by birth asphyxia; survivors can suffer permanent brain damage and irreversible damage of other organs[9].

A systematic review and meta-analysis was done on Prevalence, indications, and outcomes of caesarean section deliveries in Ethiopia: Neonatal complication following caesarean section in Ethiopia Among women who underwent Caesarean section; neonatal sepsis 19.15% , early neonatal death 2.19%, stillbirth 5% , low Apgar score 22.21% , perinatal asphyxia (PNA) 19.91% , meconium aspiration syndrome 10.47% , and prematurity 8.26% were the reported neonatal complications in this study. Among neonatal complications, low Apgar score was the most common adverse complication of the newborn followed by perinatal asphyxia and neonatal sepsis respectively in Ethiopia[10].

In Ethiopia there have been little researches done about perinatal outcome and associated factors among women with trial of labor after cesarean delivery among one cesarean section. The identified factors were also inconsistent in one research to others as well this study tries to assess duration of labour as an additional factor. In Amhara region as much as searched, there has not been any research done about this topic. Since the findings done in other areas may not represent women around our study area. Therefore, the aim of the study is to identify perinatal outcome and associated factors among women with trial of labor after cesarean delivery in public hospitals in Bahir Dar city.

### 1.3 Significance of the study

The ability to predict the outcome of an attempted trial of labor plays an important role in initial counseling of pregnant women with previous one cesarean delivery. Up to knowledge of Investigators, there is no study conducted in Amhara region particularly in the study area and little is known about the factors associated with perinatal outcomes of trial of labor after cesarean delivery.

The result of the study were used to assess the perinatal outcome and to identify the factors, which can influence the outcome, generate the overall information and for evidence based counseling about perinatal outcome and associated factors among women with trial of labor after cesarean delivery in each study sites and help to make necessary corrective action for institutions and policy makers in public hospitals in Bahir Dar city.



## 1.4 OBJECTIVES

### 1.4.1 General objective

To assess perinatal outcomes and associated factors among women with Trial of Labor after Cesarean Delivery who gave birth at public Hospitals in Bahir Dar city, Northwest Ethiopia, 2022/23

### 1.4.2 Specific objectives

1. To determine proportion of unfavorable perinatal outcomes among women with Trial of Labor after Cesarean Delivery who gave birth at public Hospitals in Bahir Dar city, Northwest Ethiopia.
2. To identify associated factors of unfavorable perinatal outcomes among women with Trial of Labor after Cesarean Delivery who gave birth at public Hospitals in Bahir Dar city, Northwest Ethiopia.

## CHAPTER TWO

### 2. LITRATURE REVIEW

#### 2.1 Perinatal outcome among women with TOLAC

Vaginal birth is a natural and physiological process. However, in certain circumstances, a caesarean section (CS) may be required to protect the woman and the baby's health[11].

A woman who has had one caesarean section in previous births has two options of mode of delivery in a subsequent pregnancy: Trial of Labor after CS (TOLAC) or planned Elective Repeat Caesarean Section (ERCS). Both options have inherent benefits and risks. Trial of labor after cesarean delivery (TOLAC) refers to a planned attempt to deliver vaginally by a woman who has had a previous cesarean delivery, regardless of the outcome[12].

A study done on factors associated with the outcome of TOLAC after one previous caesarean section, of the 1324 women studied, the VBAC rate was 65.3%. The fetal outcome (still birth, 5–minute APGAR score <7 and NICU admission) was more in the failed TOLAC group[13].

A study done on Fetomaternal Outcome of Vaginal Birth after Previous Cesarean Section, study on Tertiary Level Hospital in Bangladesh shows that the living status of the neonates 96% babies were alive, and 4% babies were neonatal death and neonatal response after birth majority 88% were spontaneous cry, 02(04%) were cried after resuscitation and 04(08%) were admitted to the neonatal care unit. Regarding APGAR score, most 92% of the neonates had a score >7 at 1 mm and 10 at 5 mm. Only 2 neonates died after VBAC.[14]

A study done on Outcome of Vaginal Birth after Caesarean Section at a Tertiary Health Facility, Southern Nigeria, from 121 mothers babies delivered were live births 117 (96.69%) with normal birth weights 100 (82.64%), Most of the babies had normal Apgar scores in the first 103 (85.12%) and fifth minutes 112 (96.55%) respectively. A few of the babies 10 (8.55%) were admitted into the special care baby unit, with the most common indication being moderate birth asphyxia 5 (45.45%) and There were 6(5.0%) still birth. [15]

Another study done on Maternal and perinatal outcome after previous caesarean section in rural Rwanda shows that 64 (21.5%) neonatal admissions to NICU and majority of admissions were due to perinatal asphyxia that occurred more often in infants whose mothers underwent trial of labor 40(13.4%). Perinatal loss rate were 8 (26.9%). Where as a study done on Outcome of pregnancy in women with previous one cesarean section in India, the neonatal morbidity was seen in 8(17.8%) neonates delivered vaginally, 16(14.95%) neonates delivered by repeat emergency cesarean section. Admission of neonates in neonatal intensive care unit, when compared between vaginally delivered group and repeat emergency cesarean section group was 10 (9.3%) and 8(17.8%) neonates respectively. There was 1(2.2%) neonatal deaths in emergency repeat cesarean section subjects and 4 (3.74%) neonatal deaths in vaginally delivered subjects. 1(0.93%) neonate who delivered vaginally was still born and no neonate was still born in subjects who had emergency CS .[16, 17]

A study done on Maternal and neonatal outcome in pregnancy with previous lower segment caesarean section undergoing trial of scar at Pandit B. D. Sharma post graduate institute of medical sciences, Rohtak India, In our study there were only 2 cases where the APGAR score was less than 6 in the patients who delivered vaginally. The rate of complication was more in the patients who required an emergency CS after a failed trial. In 9 patients APGAR score was less than 6, there were 1 still births, 1 neonatal death and 1 baby had sepsis. Only 1 case in emergency LSCS had APGAR <6 even at 5 minutes. This suggests that the rate of perinatal morbidity and mortality was higher in the patients requiring emergency caesarean section. In failed trial of scar group, there was one case of rupture rupture.[18]

## 2.2 Factors affecting perinatal outcome in TOLAC

Study done on Maternal and perinatal outcomes associated with a trial of labor after previous caesarean section in sub-Saharan countries shows Neonatal mortality before 24 hours was not significantly different between the two groups. However, the frequency of intrapartum stillbirths (2.5%) was significantly higher among women with a TOL than among women who underwent an ERCS (0.18%). The association with intrapartum stillbirth remained significant among low-risk candidates for a TOL (Among the 202 intrapartum stillbirths in the TOL group, 52 fetal deaths (26%) were related to uterine rupture[19].

## 2.3 CONCEPTUAL FRAMEWORK

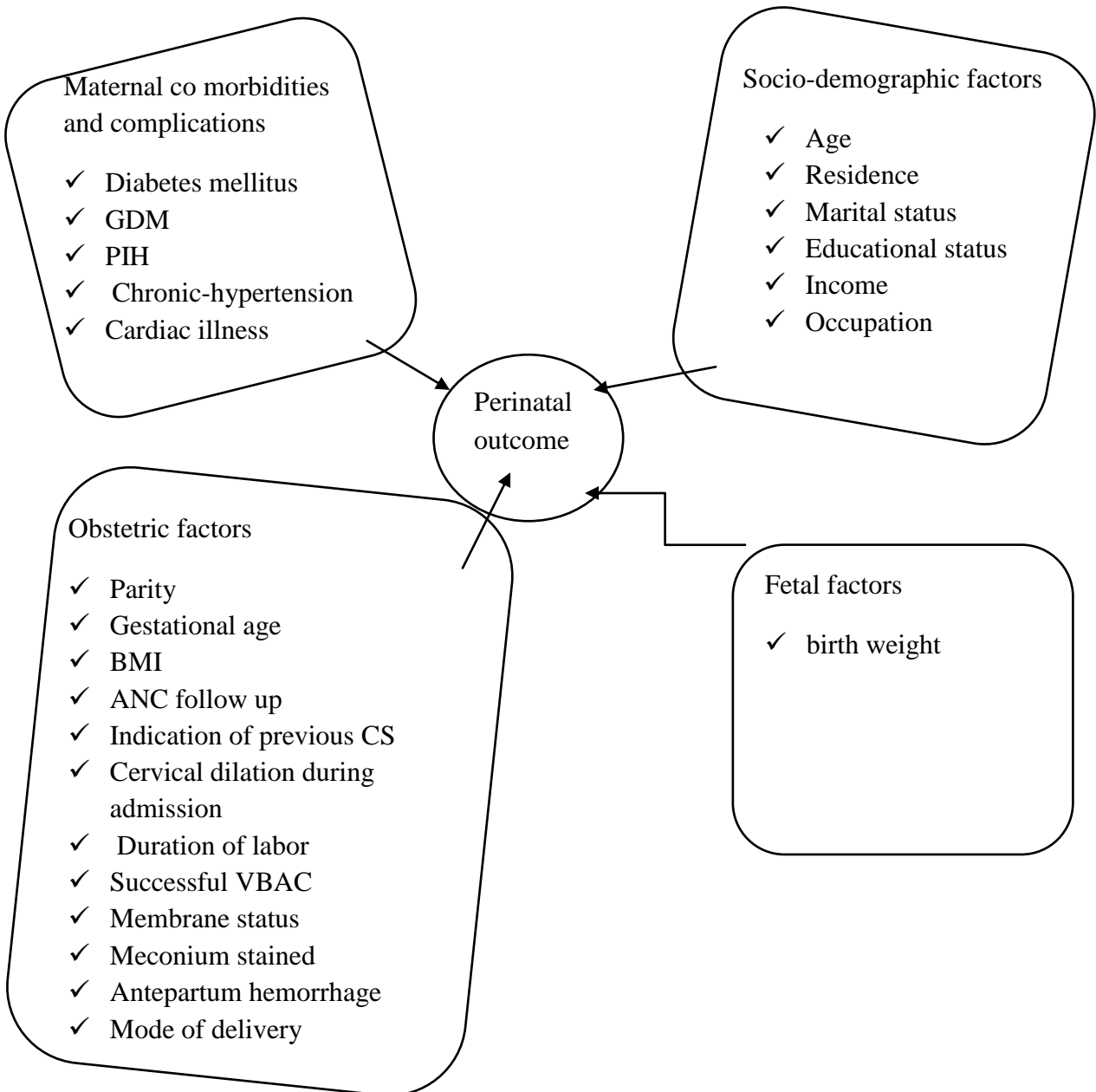


Figure 1: conceptual framework taken from different literatures for perinatal outcome and associated factors among women with TOLAC who gave birth at public Hospitals in Bahir Dar city 2022.[20]

## CHAPTER THREE

### 3. METHODS AND MATERIALS

#### 3.1 Study area

The study was conducted in Bahir Dar city Public hospitals (Tibebe Ghion Specialized Hospital, Felege Hiwot Comprehensive Specialized Hospital and Addis Alem Primary Hospital). Bahir Dar is the capital city of Amhara National Regional State, located 565 km Northwest of Addis Ababa with estimated population of 168,899 as per 2022 world population review.

The city had two tertiary hospitals, 1 primary Hospital, four private hospital, 6 health centers, 13 private clinics, 2 Non government clinics, one Fistula center, one regional public health institute.

Both TGSH and FHCSH are the two tertiary governmental hospitals in the city with estimated catchment population of seven million. FHCSH is officially started its function in 1965 G.C and delivers health care services for a long time. TGSH is a teaching hospital and giving service starting from 2019 G.C. Addis Alem Primary Hospital is started its function in 2016 G.C and one of the centers where many pregnant mothers do have follow up and care.

Bahir Dar city public hospitals had multidisciplinary staffs; includes Maternal and Fetal Medicine specialist, Gynecology Oncologist, Uro/Gynecology, Gynecologist, Gynecology and Obstetrics residents, Anesthetist, Pharmacist, Lab. Technologist, midwives and clinical nurses. There are 1 Maternal and Fetal Medicine specialist, 2 Gynecology Oncologist, 3 Maternal and Fetal Medicine fellow, 2 Gynecology Oncologist fellow, 3 UroGynecology fellow, 18 general gynecologists and obstetrics consultants, 63 Gynecology and obstetrics resident and 123 Midwife currently working in the department of gynecology and Obstetrics.

These public hospitals gave delivery service for a total of 12,352 mothers which was 5355 total deliveries with 43.7% rate of cesarean delivery at FHCSH, 3542 deliveries with 39.8% rate of cesarean delivery at TGSH and 3450 total delivery with 18.5% cesarean delivery rate, 455(13.2%) TOLAC with 350(76.9%) successful VBAC rate at Addis Alem primary Hospital by the last one year (Delivery logbook registration, 2014 E.C). Through all the days of week the services are provided free of charge for all laboring mother.[21]

### 3.2 Study design and period

A cross-sectional study design was done from April, 1/2023 to June 30/2023

### 3.3 Source population

All mothers who gave birth after trial of labor after cesarean delivery at governmental hospitals in Bahir Dar city.

### 3.4 Study population

All mothers who gave birth after trial of labor after cesarean delivery at governmental hospitals from April, 1/2023 to June 30/2023

### 3.5 Sample Size determination

Sample size determined using Epi info for single population proportion with using a prevalence value (P) of 7.7% marginal error (d) 5% and 95% confidence interval (CI). Total number of women who gave birth after trial of labor after cesarean section per year -2251(after taking one month assessment of TOLAC in FCHSH-21% and TGSH-19% respectively) and (13.2%) TOLAC at Addis Alem primary Hospital by the last one year (Delivery logbook registration, 2014 E.C).

P= Percentage of adverse perinatal outcome (5<sup>th</sup> minute APGAR score  $\leq 7$ ) after trial of labor after cesarean section (expressed as decimal 0.077 taking from study done at Attat Lord Merry Primary Hospital, Gurage Zone, South Ethiopia[6].

d= 5% of marginal error was taken.

We were obtained 120 to be the sample size(including 10% nonrespondant)

### 3.6 Sampling procedures

The sample was collected from public hospitals at Bahir Dar city with proportional sampling from each hospital using a baseline data of TOLAC in the last one year which is 1124 total TOLAC at FHCSH, 672 total TOLAC at TGSH and 455 total TOLAC at Addis Alem Primary Hospital respectively. From a total of 120 samples; 60 samples were taken from FHCSH, 36 samples from TGSH and 24 samples were taken from Addis Alem primary hospital by using

systematic random sampling technique using a calculated K value of 5 from those selected by lotter method.

Table 1: The sampling procedure for the study on perinatal outcome and associated factors among women with TOLAC who gave birth at public Hospitals in Bahir Dar city 2023

Public hospital name	Total delivery/yr	Total no. of TOLAC	Over three months	Selected by	Sample	Selected by	Total sample size
FHCSH	5355	1124	280	Proportional allocation	60	Systematic random sampling	120
TGCSH	3542	672	168		36		
Addis Alem primary hospital	3455	455	114		24		
Total	12,352	2,251	562		120		120

### 3.7 Inclusion and exclusion criteria

#### 3.7.1 Inclusion Criteria:

All mothers who gave birth after TOLAC and uterine rupture during TOLAC at public hospitals and fully involved during the study period were included.

#### 3.7.2. Exclusion Criteria:

All newborns with congenital malformations

### 3.8 Study Variables

#### 3.8.1 Dependent variable

Perinatal outcome (Favorable/unfavorable)

### 3.8.2 Independent variable

- Socio demographic factors (age, residence, profession, educational status, monthly income).
- Antepartum factors (Gravidity, Parity, PIH, APH, PROM, Oligohydraminos, IUGR)
- Intrapartum factors(Gestational age, Duration of labor, NRFHRP, Referral from other institution, pervious indication for cesarean section, history of vaginal birth after cesarean, MSAF)
- Postpartum factors (fetal outcome, neonatal resuscitation,APGAR score,NICU admissionand maternal complication)
- Medical illness (Diabetes, PIH, chronic hypertension, Asthma, Cardiac diseases)

### 3.9 Data collection methods and instrument

Interview administer quaistionare and checklist was prepared in consulting with advisor, literatures reviewed and referring different recent guidelines and other documents on perinatal outcome and associated factors among women with Trial of Labor after Cesarean Delivery. checklist were used to collect data from patient chart not answered by interview quaistionare.

Data collection was done by 6 bachelor degree midwives who had at least two years of work experience and 3 year three residents supervised the data collectors. Training on methods of data collection wase given for one day for the data collectors and for the supervisors. The data was collected from clients and charts at the time of discharge using checklist. pretest was done at Debre Tabor referral hospital on 5% of the sample size population. The checklist includes the socio-demographic variables, antepartum factors, intrapartum factors, postpartum factors, medical illness and perinatal outcome characteristics.

### 3.10 Data quality assurance

The quality of data was ensured by training for data collectors and supervisor about techniques of data collection and documentation for one day. Pre test was conducted and based on pretest tools for data collection quessionner was modified accordingly. The collection process and completeness of data was closely monitored by trained supervisor and principal investigator so as to provide feedback to correct when necessary. Data collectors, supervisor and principal



investigator were communicate each other every time about data collection and documentation activities. After data collection, each checklist and Variables in the checklist were coded.

### 3.11 Data processing and analysis

Data was checked for completeness, inconsistencies of response manually; coded, entered and analysis by using SPSS 25 version statistical software. Descriptive analysis was done by computing proportions and summary statistics and presented by using simple frequencies, tables, pi-chart and figures. A binary outcome variable indicating favorable perinatal outcome “0” and having unfavorable perinatal outcome coded as “1” were used as the dependent variable. Binary logistic regression, initially with bi-variate analysis were used to determine the association between different factors and the outcome variable. Those binary logistic regression p value<0.2 used to do Multivariable logistic regression were used to identify the relative importance of each predictor to the dependent variable by controlling for the effects of other variables with 95 confidence Interval (P-value < 0.05).

### 3.12. Operational Definitions.

Unfavorable fetal outcomes:- The presence of at least one of them (low APGAR score at 5<sup>th</sup> minute, neonatal resuscitation, NICU admission, stillbirth/early neonatal death)[22].

TOLAC- trial of labor after cesarean section to achieve VBAC[23].

Failed TOLAC:- those who underwent a Caesarean Section or needed laparotomy for rupture uterus.[13]

Successful VBAC -is defined as spontaneous or instrumental (assisted by vacuum or forceps) delivery to a woman undergoing TOLAC[12].

### 3.13 Ethical considerations

Before the data collection, ethical clearance were obtained from the Ethical committee of Bahir Dar University School of medicine. Then formal letter of cooperation was written to Bahir Dar

Town Public hospitals to obtain their consent. Study participants were informed about purposes of the study and its procedures. Oral consent were obtained from each participant and information kept confidentially.

#### 3.14 Dissemination of results

Findings of this study were presented in Bahir Dar University and submitted to Bahir Dar University school of medicine, Bahir Dar city Public hospitals, Amhara Regional Health Bureau, Federal Ministry of Health (FMOH) and other different scientific communities in the form of reports, seminars, symposium or workshops and could be published in one of the various journals.

## CHAPTER FOUR

### RESULTS

#### 4.1 SOCIO-DEMOGRAPHIC CHARACTERISTIC OF RESPONDENTS

A total of 120 participants were participated and the chart reviewed, giving a response rate of 100%. The majority of participants 56(46.7%) were found in 26-30 years and the mean age was 29.47years and  $\bar{x} \pm SD 4.57$  yrs. More than half of study participants 87(72.5%) were living in urban area. One hundred eighteen (98.3%) participants were married. Regarding their educational status of respondents 60 (50.0%) were high school and higher education holders while 38(31.7%) of them were housewife in occupation. (Table 2)

Table 2: Socio-demographic characteristics of women who underwent TOLAC in Bahir Dar public Hospitals, northwest Ethiopia, 2023

Variable	Category	Number (%)
Age	≤25yrs	21(17.5)
	26-30yrs	56(46.7)
	31-34yrs	23(19.2)
	>=35yrs	20(16.7)
	Mean age 29.47( $\bar{x} \pm 4.57$ )yrs	
Residence	Rural	33(27.5)
	Urban	87(72.5)
Marital Status	Married	118(98.3)
	Divorced	2(1.7)
Educational status	Can't read and write	17(14.2)
	Elementary school and informal education	43(35.8)

	high school and higher education	60(50.0)
Occupation	Gov't and private employee	33(27.5)
	Merchant	24(20.0)
	Farmer	25(20.8)
	Housewife	38(31.7)
Monthly income	<6587 (Below mean) EBR	72(60.0)
	≥6587 (Above mean) EBR	48(40.0)

#### 4.2 OBSTETRICS HISTORY AND REPRODUCTIVE CONDITIONS

Out of 120 cases that were given trial of labor, Majority of the study participants were received ANC follow up 117(97.5%) and term by their gestational age 103 (85.8%). While 65 (54.2%) and 95(79.2%) of the participants were Primipara and unknown prepregnancy weight respectively. For more than half of the mother 65(54.2%) and 66(55.0%), there were passage of liquor and Cervical dilatation <3cm at the time of admission respectively.

Unknown indications for pervious caesarean section were the commonest 67(55.8), while 22(18.3%) of the participants, PLFSOL were the leading indication for current caesarean section. Out of 120 cases that were given trial of labor, 63(52.5%) cases had successful VBAC, 55(45.8%) emergency CS done for failed trial of labor and 2(1.7%) laparotomy was done for rupture uterus leading to early neonatal death. (Tables 3 and 4) (Figures 2 and 3)

Table 3. Obstetric history of women who underwent TOLAC in Bahir Dar public Hospitals, northwest Ethiopia, 2023

Variables	Category	Frequency (%)	
ANC	No	3(2.5)	
	Yes	117(97.5)	
BMI	Unknown prepregnancy weight	95(79.2)	
	18.5- 24.9	20(16.7)	
	25-29.9	5(4.2)	
Gravidity	2-4	105(87.5)	
	≥5	15(12.5)	
Parity	Primipara	65(54.2)	
	Multipara	55(46.8)	
Gestational age	Unknown	17(14.2)	
	37-38.6wks	22(18.3)	
	39-40.6wks	60(50.0)	
	≥41wks	21(17.5)	
Prior vaginal delivery	No	68(56.7)	
	Yes	prior vaginal delivery	41(34.2)
		successful VBAC	11(9.2)
previous indication for CS	CPD	10(8.3)	
	NRFHRP	20(16.7)	
	MSAF	6(5.0)	
	Macrosomia	9(7.5)	
	Failed induction	4(3.3)	
	Oligohydramnous	4(3.3)	
	Unknown	67(55.8)	
Passage of liquor at the time of admission	Yes	65(54.2)	
	No	55(45.8)	
Duration of labor at the time of admission	Below the mean(<8hrs)	80(66.7)	

	Above the mean ( $\geq 8$ hrs)	40(33.3)
	$\bar{x} \pm SD$ 7.3 $\pm$ 1.95 hrs	
Cervical dilatation at the time of admission	Closed	6(5.0)
	<3cm	66(55.0)
	4-8cm	41(34.2)
	SSOL	7(5.8)
	$\bar{x} \pm SD$ 3.71 $\pm$ 1.95 cm	
Laboring institutions	Refer from other institutions	52(43.3)
	At delivery unit	62(51.7)
	At home	6(5.0)
Diagnosis at referral	LFSOL	31(25.8)
	PLFSOL	10(8.3)
	SSOL	3(2.5)
	Others	4(3.4)
Reason for referral	For better Management	29(24.2)
	no OR materials	8(6.7)
	No blood	7(5.8)

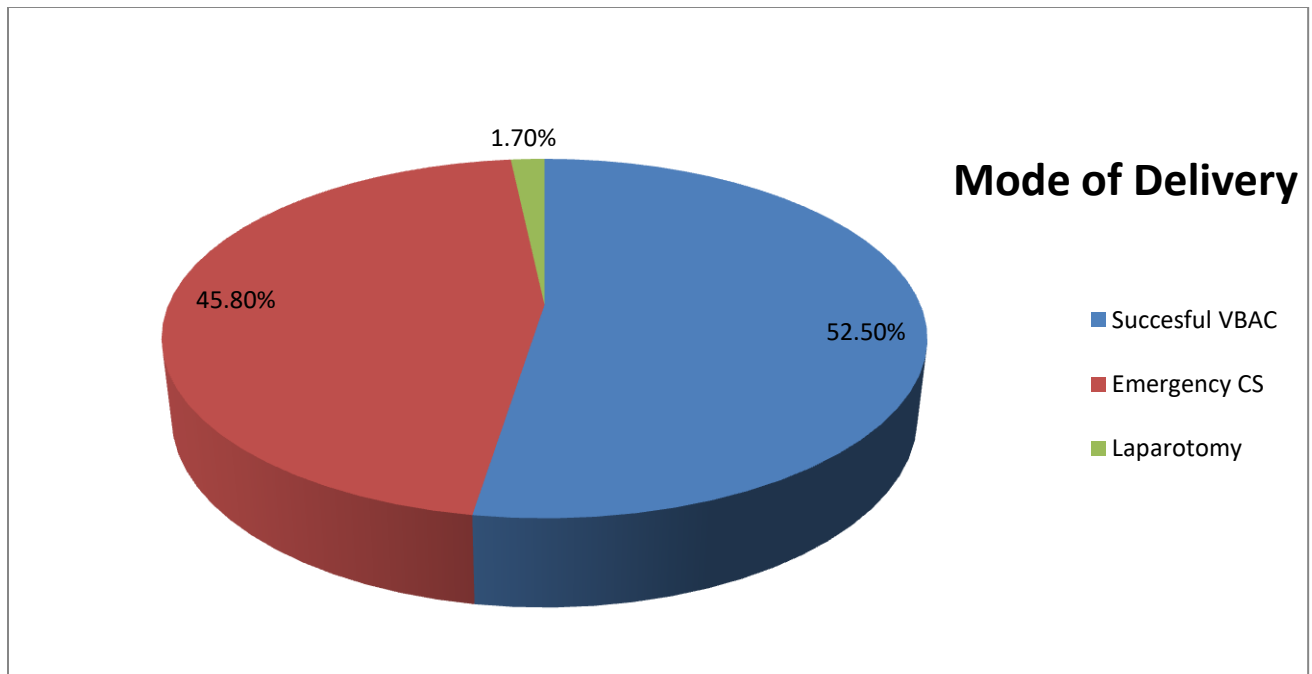


Figure 2: Mode of delivery of mothers who underwent TOLAC in Bahir Dar public Hospitals, northwest Ethiopia, 2023

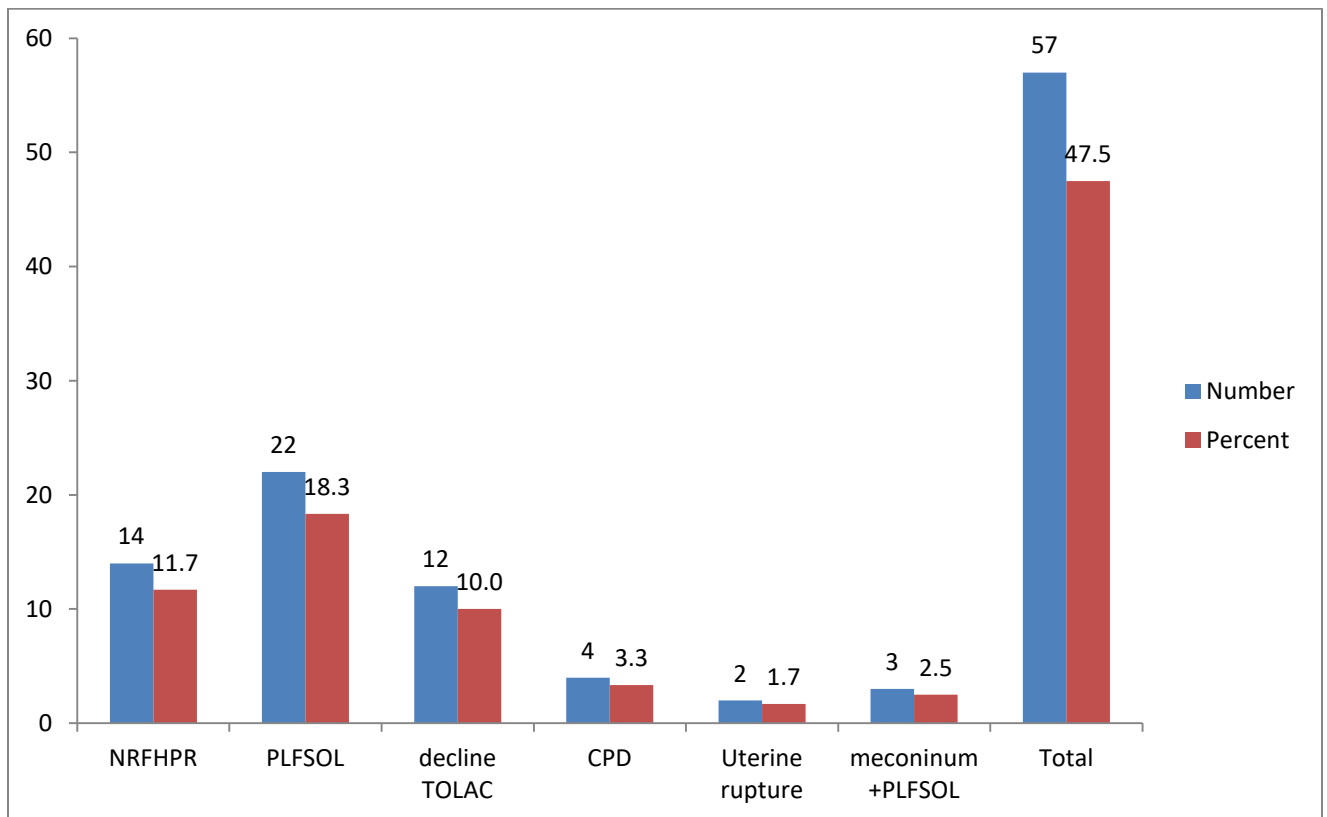


Figure 3: Indications for Emergency CS and Laparotomy among women with had failed TOLAC in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

From known indication of caesarean section in the previous pregnancy and outcome of the present labor, it was observed that all the participants who underwent caesarean section due to NRFHRP 12(60%) have a highest success rate than other causes. (Table 4)

Table 4: Indications for previous caesarean section and outcome of labor in present pregnancy among women with had failed TOLAC in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

Previous indication for CS	Outcome of labor in present pregnancy				Total
	Successful VBAC	Operative Vaginal delivery	Cesarean Delivery	Uterine rupture	
CPD	4(3.3%)	1(0.8%)	3(2.5%)	2(1.7%)	10(8.3%)
NRFHRP	11(9.2%)	1(0.8%)	8(6.7%)	0	20(16.7%)
MSAF	3(2.5%)	0	3(2.5%)	0	6(5.0%)
Macrosomia	4(3.3%)	0	5(4.2%)	0	9(7.5%)
Failed induction	0	0	4(3.3%)	0	4(3.3%)
Unknown	35(29.2%)	3(2.5%)	29(24.2%)	0	67(55.8%)
oligohydramnous	1(0.8%)	0	3(2.5%)	0	4(3.3%)
Total	58(48.3%)	5(4.2%)	55(45.8%)	2(1.7%)	120(100.0%)



#### 4.3 PERINATAL OUTCOME AND COMPLICATION

With regards to the outcome of TOLAC, almost all the babies delivered were live births 119 (99.1%) with normal birth weights 107(89.2%). In our study there were 18(15.0%) unfavorable perinatal outcome. Seven (5.8%) cases where the APGAR score were less than 7 at 5<sup>th</sup> minute in the participants, whereas 6 of them delivered via emergency CS after a failed trial. The rate of complication was more in the patients who required an emergency CS after a failed trial. There were 1 still birth, 2 early neonatal death and 16 neonate NICU admission, 5 of them had perinatal asphyxia. When we compared NICU admission between successful vaginally delivered group and repeat emergency cesarean section group was 5 (31.2%) and 11(68.8%) neonates respectively. (Table 5,6) (Figure 4)

Table 5: Perinatal outcome of women who underwent TOLAC in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

Variables	Category	Frequency (%)	
Perinatal Outcome	favorable outcome	102(85.0)	
	unfavorable outcome	18(15.0)	
Outcome	Alive	117(97.5)	
	Early neonatal death	2(1.7%)	
	Intrapartum Still birth	1(0.8)	
Sex	Male	55(45.8)	
	Female	65(54.2)	
APGAR score	At 1 <sup>st</sup> minute <7	18(16.0)	
	At 5 <sup>th</sup> minute <7	7(5.8)	
Neonatal resuscitation	No	108(90.0)	
	Yes	11(9.2)	
NICU admission	No	104(86.4)	
	Yes	PNA	5(4.2)
		Hypoglycemia	3(2.5)

		Sepsis	3(2.5)
		MAS	3(2.5)
		RDS	2(1.7)

Table 6: Fetal outcome of participants and mode of delivery among women who underwent TOLAC in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

Mode of delivery	APGAR <7 at 5 <sup>th</sup> minute	Neonatal Resuscitation	NICU admission	Diagnosis at NICU					Mortality
				PNA	Hypoglycemia	sepsis	RDS	MAS	
successful VBAC	1	3	5	2	0	2	1	0	1
cesarean delivery	4	6	9	2	3	1	1	2	0
Laparotomy	2	2	2	1	0	0	0	1	2

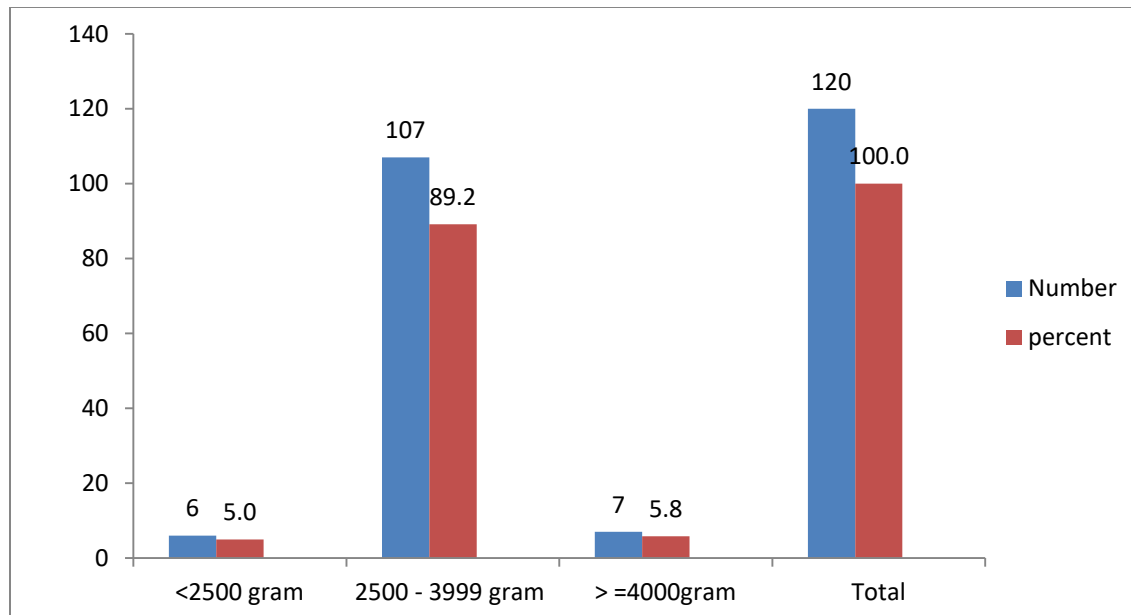


Figure 4: birth weight outcome of women who underwent TOLAC in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

#### 4.4 FACTORS ASSOCIATED WITH PERINATAL OUTCOME AMONG WOMEN WITH TRIAL OF LABOR AFTER CESAREAN DELIVERY

Multivariate logistic regression analysis was done for factors with P-value of-less than 0.25 in bivariate analysis to see the association among variables. According to the multivariate logistic regression analysis result, place of residence, duration of labor and mode of delivery was found to have significant association with unfavorable perinatal outcome. Multivariable logistic regression analysis showed that the odds of unfavorable perinatal outcome increased by 9.9 times more affected than those respondents residence rural when compared with those urban [AOR =9.99; 95% CI 2.92, 34.23]. It was found that the risk of unfavorable perinatal outcome increased by 4.4 times [AOR =4.4; 95% CI: 1.17, 16.49] for mothers failed TOLAC than successful VBAC and the odds of unfavorable perinatal outcome 6.23 times higher among those who had labor duration more than mean ( $\geq 8$ hrs ) at the time of admission [AOR=6.23; 95% CI 1.67, 23.22].( Table 7)

Table 7: factors associated with perinatal outcome among women with trial of labor after cesarean delivery (multivariable logistic regression) in Bahir Dar city, Public Hospitals, northwest Ethiopia, 2023

Variables	Category	Outcome		COR	P-value	95% CI	AOR	P-value	95% CI
		Favorable	Unfavorable						
Residency	Rural	21(17.5%)	12(10%)	7.71	0.00**	(2.59, 22.97)	9.98	0.00*	(2.91-34.23)
	Urban	81(67.5%)	6(5%)	1			1		
Educational status	can't read and write	11 (9.2%)	6(5%)	4.13	0.03**	(1.16, 14.69)	0.19	0.16	(0.02,1.95)
	Elementary school and informal education	38 (31.7%)	5(4.2%)	0.99	0.99	(0.294, 3.38)	1.79	1.79	(0.29,10.82)
	high school and higher education	53 (44.2%)	7(5.8%)	1			1		
Occupation	House wife	30(25.0%)	3(2.5%)	1.55	0.64	(0.24, 9.94)	0.88	1.16	(0.14, 9.56)
	Merchant	21(17.5%)	3(2.5%)	2.21	0.40	(0.34, 14.4)	0.70	.65	(0.07, 5.94)
	Farmer	20(16.7%)	10(8.5%)	7.75	0.01**	(1.53, 39.1)	0.77	1.47	(0.1, 20.96)
	Gov't and private employee	31 (20.8%)	2(1.7%)	1			1		
ANC follow up	No	1(0.8)	2(1.7%)	0.08	0.04**	(0.00, 0.93)	9.55	0.15	(0.44, 22)
	Yes	101(84.2%)	16(13.3%)	1			1		
Duration of labor	<8cm	72(60.0%)	8(6.7%)	1			1		
	≥8cm	30(25.0%)	10(8.3%)	3.0	0.035**	(1.08, 8.24)	6.23	0.01*	(1.67, 23.22)
Mode of delivery	successful VBAC	57(45.5%)	6(5.0%)	1			1		
	Failed TOLAC	45(37.5%)	12(10.0%)	0.08*	2.53	(0.88, 7.27)	4.4	0.03*	(1.17, 16.49)

Key: 1: Reference category; AOR = Adjusted odds ratio, COR = Crude odds ratio

\*\*statistically significant at p-value<0.25, \*statically significant at p-value<0.05,

## CHAPTER FIVE

### DICUSSION

In this study the unfavorable perinatal outcome of labor among respondents who had trial of labor after cesarean section was 18(15.0%). Almost all the babies delivered were live births 119(99.1%), 7(5.8%) cases where the APGAR score were less than 7 at 5<sup>th</sup> minute, whereas 6 of them delivered via emergency CS after a failed trial and 11(9.2%) needs Neonatal resuscitation. There were 1 still birth, 2 early neonatal death and 16 neonate NICU admission, 5 of them had perinatal asphyxia. This outcome was better when compared to a study done in Gurage Zone, South Ethiopia, Majority of neonatal first minute APGAR score were 127(75.1%) of neonate with 1<sup>st</sup> minute APGAR score of  $\geq 7$ , 13(7.7%) neonate APGAR score  $< 7$  at 5<sup>th</sup> minute, and 3(1.8%) fetal death( [6] ) but, This finding is higher than a study done at a Tertiary Health Facility, Southern Nigeria, babies delivered were live births 117 (96.69%), Most of the babies had normal APGAR scores in the first 103 (85.12%) and fifth minutes 4(3.5%) respectively. A few of the babies 10 (8.55%) were admitted into the special care baby unit, with the most common indication being moderate birth asphyxia 5 (45.45%) and There were 6(5.0%) still birth. When we compare this study to a study done in Nigeria, there were more babies admitted to special care baby unit with the same indication for admission birth asphyxia and less still birth.[15] This is might be due to difference in method of intra-partum fetal monitoring, difference in period of conduction and study design.

The finding in this study was also better outcome when compared to studies conducted in rural Rwanda, shows that 64 (21.5%) neonatal admissions to NICU and majority of admissions were due to perinatal asphyxia 40(13.4%) and Perinatal loss rate were 8 (26.9%)[16] and a study done in India with outcome of neonatal morbidity was seen in 8(17.8%) neonates delivered vaginally, 16(14.95%) neonates delivered by repeat emergency cesarean section after trial of labor and admission to NICU vaginally delivered group and repeat emergency cesarean section after trial of labor group was 10 (9.3%) and 8(17.8%) neonates respectively. There was 5(5.94%) neonatal deaths (mode of delivery was 1(2.2%) and 4(3.74%) emergency CS after trial of labor and successful VBAC respectively).[18]

This study finding was to similar with the study done in Tertiary Level Hospital in Bangladesh shows that the living status of the neonates 96.0% babies were alive, and 4% babies were neonatal death and 02(04%) were cried after resuscitation. But, Regarding APGAR score and NICU admission, 92% of the neonates had a score >7 at 1 mm and 10 at 5 mm and 04(08%) were admitted to the neonatal care unit. This shows that better outcome compared to this study. This might be due to difference in study design, study period and study population[14].

In this study, place of residence, duration of labor and unsuccessful VBAC was found to have significant association with unfavorable perinatal outcome. Our results showed that neonatal complications were higher in unsuccessful TOLAC. This was confirmed previous studies findings Nigeria, India, Bangladesh and sub-Saharan countries[14, 15, 18, 19]

## CHAPTER SIX

### CONCLUSSION AND RECOMMENDATION

#### 6.1 CONCLUSSION

The unfavorable perinatal outcome of labor among respondents who had trial of labor after cesarean section was 18(15.0%). Place of residence, duration of labor and failed TOLAC was found to have significant association with unfavorable perinatal outcome. Our results showed that unfavorable neonatal outcome were higher in failed trial of labor after ceseral section. .

#### 6.2 RECOMMENDATION

1. The institution should develop its own Evidence-based clinical practice guidelines (TOLAC protocol) for mothers who had previous CS, attending trial of labor and monitor its implementation.
2. The institution should integrate and monitor TOLAC delivery logbook.
3. It recommends to do further study with different study design.

#### LIMITATION AND STRENGTH OF THE STUDY

The strength of this study is, we used interview and document review, so, it decrease missing information. This study might be considered the first to asses perinatal outcome and associated factors among women undergone trial of labor after cesarean delivery in Bahir Dar city public hospitals.

On the other hand;

This study was a cross-sectional study and may not show the cause and effect relationship.

Our perinatal outcome data is limited up to discharge of the women; therefore cases occurring after discharge may be missed.

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Appendices

ANNEX I: Participant Information Sheet and Voluntary Consent Form

Date \_\_\_\_\_

Code \_\_\_\_\_

Health facility Name \_\_\_\_\_

My name is ..... I am here on behalf of Dr Biyadgie Aschale Alamneh (Resident in Obstetrics and Gynecology), he is working on this research project by with the objective to assess perinatal outcome and associated factors among women with trial of labor after cesarean delivery in Public hospitals in Bahir Dar city, Northwest Ethiopia, as partial fulfillment of specialty in Obstetrics and Gynecology. I am interviewing and observing mothers chart who gave birth after TOLAC and you are selected for the interview. Your name and card number will not be written in this form and the information is kept confidential. If you do not want to answer, all or some of the questions you do have the right to do so. However, your willingness and support to answer all of the questions will be appreciated. This interview will take around 15-20 minutes.

Risks: by participating in this study you will not face any risk but if you suspect any risk you can rise at any time.

Benefits & incentives: No incentives you will get in participating in this study.

If you have questions regarding this study or would like to be informed of the results after its completion, please do not hesitate to contact

Dr. Biyadgie Aschale (0913474436) Email; biyadgieaschale21@gmail.com

I thank you

Would you participate in responding to questions?      Yes \_      No\_

If yes continue or if no give thanks & proceed to other participant.

Name of data collector \_\_\_\_\_ sign. \_\_\_\_\_ Date \_\_\_\_\_

ANNEX II: QUESTIONNAIRE

Date \_\_\_/\_\_\_/\_\_\_\_\_

checklist Identification Number \_\_\_\_\_

Section I: Sociodemographic characteristics of participants

Ser NO.	Variables	Response and Coding
101	Age	___Age in completed years
102	Place of residence	1=Rural 2=Urban
103	Marital status	1= Single 2= married 3= Divorced 4= Widowed 5= Separated
104	Religion	1= Orthodox Christian 2= Protestant Christian 3= Muslim 4= Others (specify) _____
105	Educational status	1= Can Not Read And Write 2= Can Read And Write 3= Primary (Grades 1-8)

		4= Secondary (Grade 9–12) 5= Collage And Higher Education
106	Monthly income	Approximately____ETB
107	Occupation at this time?	1=Government employee 2=Merchant 3=Farmer 4=private employee 5=Student 6=Others(specify)-----

## Section II: Assessment of antenatal factors

Ser.no	Variables	Response	Skip to
201	Gravidity	_____	
202	Parity	_____	
203	Gestational age	1= _____wks 2=Unknown	
204	Body mass index (BMI)	1=_____Kg/m2 2= Unknown prepregnancy weight	
205	ANC follow up	1=Yes 2= No	If no, skip to 207
206	Where is your ANC follow up	1= Health Center 2= Public Hospital 3= Private Institutions	
207	Previous indication for caesarean section?	1= CPD 2= NRFHRP 3=MSAF	

		4=Macrosomia 5= unknown 6= others (specify)_____	
208	Inter delivery interval	1=<18 Months 2=18-24months 3=24- 60 months 4=>60months	
209	Did you have vaginal delivery?	1= yes 2= No	If no, skip to211
210	If your answer is yes for Question No. 209	1= Prior vaginal delivery 2=Successful VBAC	

### Section III. Intrapartal factors

301	Did you have fetal abnormality?	1=Yes 2=No	
302	Cervical dilatation at admission?	_____cm	
303	Duration of labor	_____hrs	
304	Where is she laboring?	1= Refer from other institution 2.= At this hospital	If at this hospital skip to 307
305	If referral, diagnosis at referral	_____	
306	Reason for referral	_____	
307	Liquor status at the time of admission	1=Intact 2-Clear 3=MSAF 4= Bloody	
308	If rupture, specify ways of rupture of membrane	1=Spontaneous before labor 2=Spontaneous during labor 3=Artificial rupture of membrane	
309	Mode of delivery	1= Successful VBAC 2=Instrumental delivery	

		3= Cesarean delivery	
310	If your answer is Cesarean delivery for Question No. 309. What will be the indication? (Failed TOLAC)	1= NRFHRP 2= PLFSOL 3= Decline TOLAC 4=CPD 5= Scar Dehiscence 6= Others (specify) _____	

Section IV. Postpartum factors

4.1	perinatal outcome	1= Alive 2= Early neonatal death 3= Antepartum Still birth 4= Intrapartum SB	
4.2	Sex	1= Male 2=Female	
4.3	Weight	_____ Grams	
4.4	APGAR score at 1 <sup>st</sup> and 5 <sup>th</sup> minutes	_____ and _____	
4.5	Neonatal Resuscitation	1= Yes 2=No	If no, skip to 405
4.6	If your answer is yes for Question No. 4.3	APGAR score at 1 <sup>st</sup> & 5 <sup>th</sup> minute _____	
4.7	NICU admission	1= Yes 2=No	If no, skip to 407
4.8	If your answer is yes for Question No. 4.5 What was the Diagnosis?	1=PNA 2=Hypoglycemia 3=sepsis 4=RDS 5= Others (specify) _____	

### ANNEX III: CHECKLIST

	Clinical criteria	Answer
01	Weight	
02	Sex	
03	APGAR Score at 1 <sup>st</sup> minute	
04	APGAR Score at 5 <sup>th</sup> minute	
05	Neonatal resuscitation and APGAR score after resuscitation@5 <sup>th</sup> minute	
06	NICU admission	0=yes 1-No
07	NICU admission diagnosis-	
08	Indication for Emergency CS after failed TOLAC	
09	Gestational age	