

**PREVALENCE AND FETAL OUTCOME OF SINGLETON
BREECH DELIVERY AT TERCHA GENERAL
HOSPITAL, SNNPRS, ETHIOPIA**



BY:

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ETHIOPIA**

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Abstract

Introduction: Breech deliveries have always been major issues in obstetrics because of the very high perinatal mortality and morbidity. However, there is paucity of information in the incidence and outcome of breech deliveries in the current study area

Objective: To assess the prevalence and fetal outcome of singleton breech deliveries at Tercha General Hospital

Methods: Institution based cross sectional retrospective study was conducted to assess the prevalence and outcome of singleton breech delivery utilizing a five years data from January 1, 2009 to December 31, 2013 at Tercha General Hospital. Records of all mothers who gave birth in Tercha General hospital and all hospital records of pregnant women with a clinical diagnosis of breech presentation and gave birth in this hospital of this five years period was used as a source population and sample size respectively. Sampling technique is in such a way that, first, Obstetrics and operative records from obstetric ward and major operation registry book in the operation room was reviewed to identify women who present with breech presentation and delivered in the specified period. Next, using card no. of patients, cards was collected from the card room. Finally, based on the inclusion and exclusion criteria of the study cards was selected, the collected data was checked for its completeness, entered into SPSS-16 database program for analysis.

Result: The prevalence of singleton breech deliveries was 3.1% (106 out of 3565 deliveries). Out of the total breech deliveries 90(84.9%) born alive and 16(15.1%) were dead indicating that the perinatal mortality rate to be 151 per 1000 breech deliveries. Among alive ones 62(68.9%) were born healthy, 24(26.7%) asphyxiated and 4(4.4%) born with birth injury. The documented possible causes of death in this study were entrapment of after coming head 4 (25%), birth asphyxia 6 (37.5%), cord prolapse 2(12.5%) and intrauterine death of unknown cause 4 (25%). Vaginal delivery has significant statistical association with poor(dead) fetal outcome of breech delivery ($p=0.038$). ANC has significant statistical association with fetal outcome.

Key words: Fetal outcome, Breech delivery, Associated factors

Conclusion and recommendation

- The prevalence of singleton breech delivery in this study is 3.1% that is comparable with the standard. The fetal (perinatal) mortality is 151/1000 breech deliveries showing higher number than the national report. ANC follow up is found to be the most important independent factor affecting the fetal outcome of breech deliveries. Vaginal breech delivery has high fetal death as compared to cesarean delivery. So efforts need to be intensified in all aspects to minimize the reported higher number of the perinatal (fetal) mortality of breech deliveries. ANC follow up should be given more emphasis than before and further study by experts is recommended on this issue.

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List of Acronyms and abbreviations

ANC	Antenatal care
CI	Confidence Interval
ECV	External Cephalic Version
MCH	Maternal and child Health
NRFHR	Nonreassuring fetal heart rate
PROM	Premature Rupture of Membrane
SPSS	Statistical package for social science
SNNPRS	southern nations nationalities and peoples regional state

1. INTRODUCTION

1.1 Background

Breech presentation is a longitudinal lie of the fetus with the caudal pole (buttock or lower extremity) occupying the lower part of the uterus and cephalic pole in the uterine fundus. Breech presentation is more common remote from term because the bulk of each fetal pole is more similar. Most often, however, as term approaches, the fetus turns spontaneously to a cephalic presentation because the increasing bulk of the buttock seeks the more spacious fundus (1). But, breech presentation persists in 3 to 4 percent of singleton deliveries at term. Factors other than gestational age that predispose to breech presentation include hydramnios, high parity with uterine relaxation, multiple fetuses, oligohydramnios, hydrocephaly, anencephaly, uterine anomalies, placenta previa, fundal placental implantation, and pelvic tumors (2).

Breech presentation occurs when spontaneous version to cephalic presentation is prevented as term approaches or if labor and delivery occur prematurely before cephalic version has taken place (3).

There are three categories of breech presentation based on the varying relations between the lower extremities and buttocks. These are frank, complete, and incomplete breech presentations. With a frank breech presentation, the lower extremities are flexed at the hips and extended at the knees, and thus the feet lie in close proximity to the head. A complete breech presentation differs in that one or both knees are flexed. With incomplete breech presentation, one or both hips are not flexed, and one or both feet or knees lie below the breech, such that a foot or knee is lowermost in the birth canal (4)

The diagnosis of breech presentation in clinical practice is based on the Leopold maneuver specifically the first Leopold maneuver which is done by palpating the fundal part of the uterus by two hands so that in breech gives the sensation of a large, nodular mass, whereas the head feels hard and round and is more mobile and ballotable. But there is varying accuracy of palpation in performing this maneuver. Thus, with suspected breech presentation—or any presentation other than cephalic—sonographic evaluation is indicated.(5)

Breech deliveries have always been a major issues in obstetrics because of the very high perinatal mortality and morbidity. These are due to combination of trauma, birth asphyxia, prematurity and malformation. Thus wide ranges of management policies have been instituted

with the aim of reducing this perinatal morbidity and mortality, and hence improve the quality of life of these infants later in life(6)

1.2 Statement of the problem

Breech presentation occurs in about 3-4% of all term singleton pregnancies(12) .

Perinatal mortality is increased 2- to 4-fold with breech presentation, regardless of the mode of delivery. Compared with a fetus with cephalic presentation, a breech fetus faces an increased risk of asphyxia from cord compression and of traumatic injury during labor and delivery of the shoulders and head.(13) Because of the greater frequency of operative delivery, there is a higher rate of maternal morbidity for pregnancies complicated by breech deliveries. The most worrisome are genital tract lacerations. Intrauterine maneuvers, especially with a thinned lower uterine segment, or delivery of the aftercoming head through an incompletely dilated cervix, may cause rupture of the uterus, lacerations of the cervix and vaginal walls, or both. Such manipulations also may lead to extensions of the episiotomy and deep perineal tears. Anesthesia sufficient to induce

appreciable uterine relaxation may cause uterine atony and in turn, postpartum hemorrhage. Finally, manual manipulations within the birth canal increase the risk of infection.(1).

Thus wide ranges of management policies have been instituted with the aim of reducing this perinatal morbidity and mortality, and hence improve the quality of life of these infants later in life(6)

External cephalic version (ECV) is one of such policies. Advocates of ECV believe that in the absence of a complicated breech presentation and other contraindications to vaginal delivery, a successful ECV leads to a more favorable presentation and reduces the incidence of breech deliveries, perinatal morbidity and mortality (7,8,9).

The problem is further compounded in our environment, where only a small percentage of pregnant women assess the available antenatal services and many of them present to the hospital in advanced stages of labour or with intra-uterine fetal death (10). Hence only a few of them benefit from planned vaginal breech delivery (11). The optimal management of breech presentation at term remains a debating issue in the labour ward, and in the obstetric literature. The opinions of many have been polarized by their personal experiences, good and bad, and there have been no prospective randomized trials of sufficient size to resolve this issue. In the

absence of such information, obstetricians have to rely on data derived from retrospective analysis(15)

This retrospective study is therefore, undertaken to determine the prevalence and outcome and thus evaluate our present mode of management of breech presentations with a view to improving on our current management modalities and thus further reduce the fetal morbidity and mortality from breech deliveries.

Chapter two

2.1 Literature Review

The percentage of breech deliveries decreases with advancing gestational age from 22% of births prior to 28 weeks' gestation to 7% of births at 32 weeks' gestation to 1-3% of births at term. In singleton breech presentations in which the infant weighs less than 2500 g, 40% are frank breech, 10% complete breech, and 50% footling breech. With birth weights of more than 2500 g, 65% are frank breech, 10% complete breech, and 25% footling breech.(1)

Before 28 weeks, the fetus is small enough in relation to intrauterine volume to rotate from cephalic to breech presentation and back again with relative ease. As gestational age and fetal weight increase, the relative decrease in intrauterine volume makes such changes more difficult. In most cases, the fetus spontaneously assumes the cephalic presentation to better accommodate the bulkier breech pole in the roomier fundal portion of the uterus.(2)

6% of breech presentations are found to have congenital malformations, which include congenital hip dislocation, hydrocephalus, anencephalus, familial dysautonomia, spinal bifida, meningomyelocele, and chromosomal trisomies. Thus, those conditions that alter fetal muscular tone and mobility increase the likelihood of breech presentation (2)

Analysis of data from a population based registry showed that the risk of breech presentation in a second pregnancy was 9 percent if the first infant was breech and 2 percent if the first infant was non breech [17]. After two consecutive breech deliveries, the risk of another breech presentation rises to 21 to 28 percent [17], and after three consecutive breech deliveries the risk is 38 percent [17].

In Europe (notably in France, Belgium, Ireland, Switzerland, and the Netherlands), planned vaginal breech delivery based on selected strict criteria remains relatively frequent with rates as high as 54%. They reported that, in areas where planned vaginal delivery is a common practice and when strict criteria are met before and during labor, planned vaginal delivery of singleton fetuses in breech presentation at term remains a safe option that can be offered to women. (19)

In the United States, cesarean delivery for breech presentation rose from 12 percent in 1970 to 87 percent in 2001 . This change in clinical practice was largely due to evidence from randomized trials, particularly the Term Breech Trial , that showed a policy of planned cesarean delivery for term breech presentation was associated with a large decrease in perinatal/neonatal mortality and neonatal morbidity, with only a modest increase in short-term maternal morbidity, compared with a policy of planned vaginal delivery(6).

Study conducted over a 12-month period (from 1 September 2005 to 31 August 2006) on women attending the delivery room with a live singleton term breech presentation at the maternity and child hospital in Basra, Iraq, Of 210 women in labour in Basra maternity and child hospital, 97 underwent vaginal breech deliveries and 113 delivered by caesarean section. Birth trauma was restricted to vaginal deliveries. The perinatal mortality was significantly higher in vaginal deliveries (8.2%) compared with caesarean deliveries (0.9%). A higher perinatal mortality was recorded among infants > 3500–4000 g birth weight in vaginal deliveries. (31)

In an observational prospective survey done in France and Belgium in study population consisted of 8105 pregnant women delivering singleton fetuses in breech presentation at term in 138 French and 36 Belgian maternity units Cesarean delivery was planned for 5579 women (68.8%) and vaginal delivery for 2526 (31.2%). Of the women with planned vaginal deliveries, 1796 delivered vaginally (71.0%). The rate of the combined neonatal outcome measure was low in the overall population (1.59%; 95% CI [1.33-1.89]) and in the planned vaginal delivery group (1.60%; 95% CI [1.14-2.17]). It did not differ significantly between the planned vaginal and cesarean delivery groups (21).

In a retrospective study of 306 singleton term breech deliveries that took place between 1989 and 1994 in Free University Hospital, Amsterdam, The Netherlands, 170 infants were delivered vaginally, 72 by elective and 64 by secondary cesarean section. Even after application of strict selection criteria -- i.e. prior pelvic assessment by staff obstetricians, an estimated birth weight of 2500-4000 g -- and with staff supervision, vaginal delivery turned out to be associated with a significantly higher incidence of low umbilical artery pH values and neonatal care unit admissions as compared to elective cesarean section. Five infants suffered mechanical trauma. One neonatal death occurred in the vaginal delivery group(19).

The incidence of all patients who had singleton breech delivery at the University of Calabar Teaching Hospital, Calabar(a seaport in southeastern Nigeria) over a 10 year period was 1.41% and 69.34% of these had vaginal breech delivery. The perinatal mortality rate was 158/1000 births. Majority of vaginal breech deliveries occurred in multiparous women (56.8%) and at term (61.1%). The perinatal outcome was worse in babies who weighed above 3.5kg (50.0%), in those born to multiparous women (57.4%)(23).

Outcome of Singleton Term Breech Deliveries at a University Teaching Hospital in Eastern Nigeria, there were 122 singleton breech deliveries out of a total 4741 deliveries. The prevalence of singleton term breech deliveries in the study period was 2.6%. Eighty eight (72.1%) of the breech deliveries were through the vaginal route, while 22 (18.0%) and 12 (9.8%) were through elective and emergency caesarean sections respectively. A total prenatal deaths of 32 (36.2%) were recorded. These included 8 (6.6%) intra-uterine deaths prior to admission, fresh still birth 15 (12.3%) and earlyneonatal death 7 (5.7%). Nineteen (61.9%) of the perinatal deaths occurred in un-booked mothers. The perinatal mortality rate was 250 in 1000 deliveries.(28)

In a three years period (September 1989 to August 1992), among 7,170 consecutive deliveries at Yekatit 12 Hospital, Addis Abeba, Ethiopia, there were 291 singleton breech deliveries with a 4% incidence rate at a gestational age of 28 weeks and above. In 28% and 57% of the infants, weight was below 2,500 grams and Apgar score was less than 7 in the first minute, respectively. The gross perinatal mortality rate for breech delivery in the first 24 hours was 330 per 1,000 deliveries, which was significantly higher than for the total number of deliveries (70 per 1,000; $p < 0.001$). However, the perinatal mortality rate was 1,000 per 1,000 deliveries for

foetuses of less than 1,500 grams, 635 for foetuses between 1,500-2,500 grams, and 156 for foetuses of greater than 2,500 gm. In general, foetuses with low birth weight showed a high mortality rate ($p < 0.001$). There was also a two-fold increase in perinatal death in patients without antenatal care ($p < 0.001$)(22).

wide ranges of management policies have been instituted with the aim of reducing this perinatal morbidity and mortality, and hence improve the quality of life of these infants later in life(1).

The Royal College of Obstetricians and Gynecologists in 2001(12), recommended that all women with an uncomplicated breech presentation at term be offered an ECV. Those against ECV on the other hand argue that the incidence of breech deliveries and perinatal morbidity are not better in units where ECV are practiced when compared to units that avoid it (7). Moreover some successful ECV later revert to breech presentation. The recent use of ultrasound guidance in ECV has however improved it. In our environment where facilities for monitoring fetal activities are deficient, the detection of fetal compromise after ECV may be difficult. It is on this basis that most units in developing countries offer assisted vaginal deliveries for appropriate and well-selected cases and caesarean section for cases in which vaginal delivery may pose problems

2.2. Significance of the Study

Since this study is aimed to assess the prevalence and outcome of breech deliveries towards the mode of delivery it will help me in my future career to have basic knowledge on these issues and tends to solve problems accordingly. Since there is no study conducted on perinatal outcome of breech delivery in the study area, the result of this study will help Tercha General Hospital in developing management protocol of breech deliveries and Dawuro zonal health department in facilitating referral systems of health institutions. Apart from that, this study will give additional input to the previous studies, and it will serve as a starting point for further studies in the future.

2.2 Conceptual Framework

The arrows in the framework indicate the direct effect of the boxed factors on the outcome variable of the study.

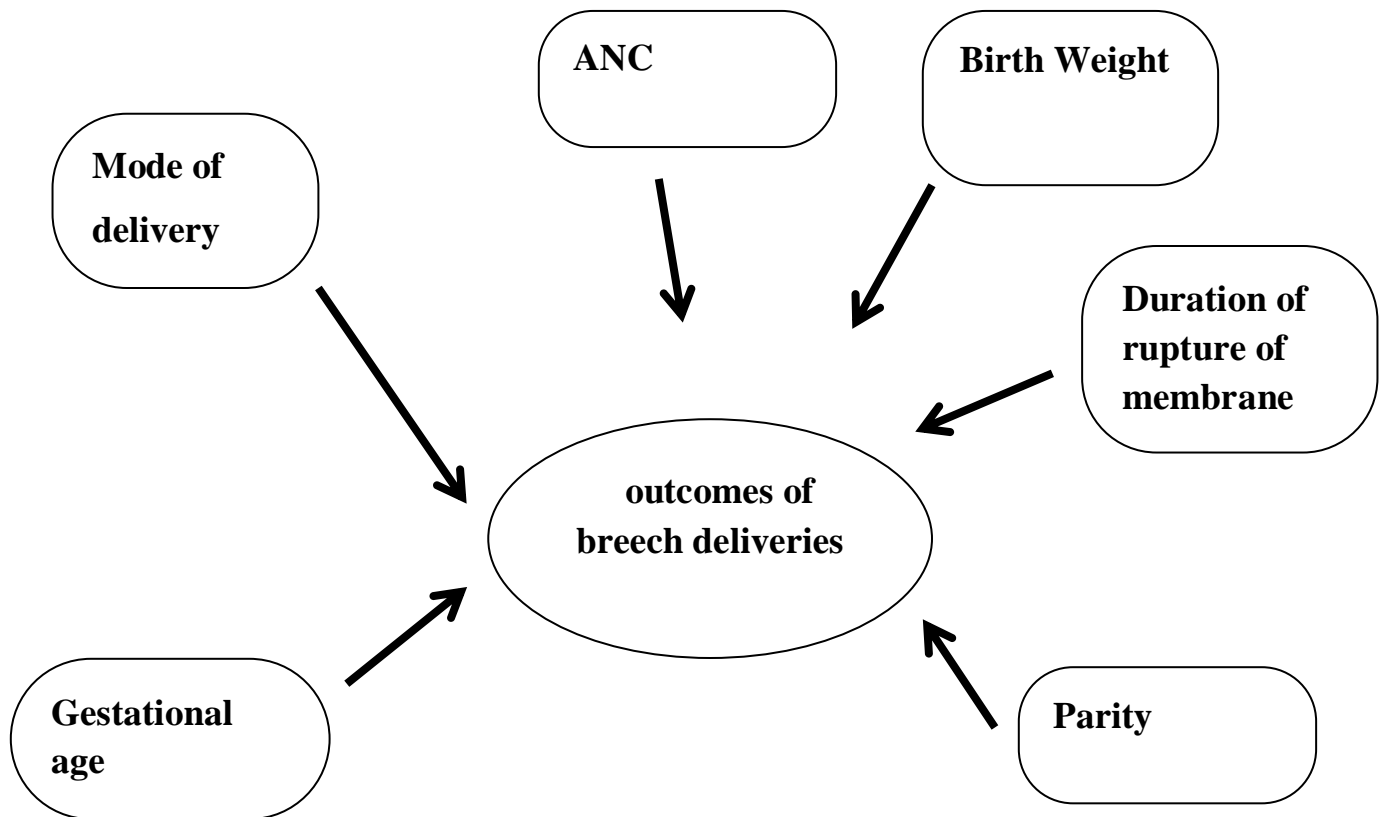


Figure 1.1: Conceptual framework: Factors affecting fetal outcome of breech deliveries

Chapter three

Objectives of the study

3.1 General objective

To assess the prevalence and fetal outcome of breech deliveries among mothers who gave birth at Tercha General Hospital from January 1, 2009 to December 2013

3.2 Specific objectives

1. To determine the prevalence of breech deliveries among mothers who gave birth at Tercha General Hospital from January 1, 2009 to December 2013
2. To determine the fetal outcomes of breech delivery among mothers who gave birth at Tercha General Hospital from January 1, 2009 to December 2013
3. To identify factors associated with the fetal outcomes of breech deliveries at Tercha General Hospital

Chapter four

Methodology

4.1 Study area and period

The study was conducted in Tarcha General Hospital using records of women who gave breech deliveries(3567) from January 1, 2009 to December 2013. The Hospital is located south west of Addis Ababa 489km along the Jimma road and 282km far from Hawasa which is capital city of Dawro Zone. The zonal climate temperature ranges from15.1-27.5oc, annual rain fall 120-1800ml and 500m -2820m above sea level. The service has been operative since 1995E.C. The service is owned by MOH. Dawro Zone has total population 573077 & 4436km² area i.e. 129 inhabitants per square kilometer. The total number of population in the catchment area is 850,000. Out of this the number of women in the reproductive age group (15-45year) is 131808 and the expected number of deliveries per year is 20289. There are 18 Health Centers, 175 health posts,7 private clinics , and 6 rural drug venders from 5 woredas and tarcha town using the Hospital as referral center. The nearest Hospitals are jimma university specialized Hospital in jimma, 145km away, and wolayta referal Hospital, 120km away, Hawasa referral hospital, 282km away.

The Hospital has 112 beds. There are 48 beds in the Maternity ward, 1 Labor Beds and 2 Delivery Beds. There is 1 obstetrician/gynecologist, 1 surgeon, 5 GPs, 3 Health officer, 3 pharmacists, 5 druggists, 55 nurses, 4 laboratory technologists, 5 lab technicians, 10 midwifery. There are 87 supportive staff members.

4.2 Study Design

Institution based cross sectional retrospective study was conducted on the prevalence and fetal outcome of breech deliveries among mothers who have given birth in the past five years at Tercha Geneal Hospital SNNPRS,Dawuro Zone

4.3 Population

4.3.1 Source Population

Records of all mothers who gave birth in Tercha Geneal Hospital during January 1, 2009 to December 2013.

4.3.2 Study Population

Records of all mothers who gave birth of singleton breech deliveries in Tercha Geneal Hospital from January 1, 2009 to December 31, 2013 fulfilling all the inclusion criteria.

4.4. Inclusion and Exclusion Criteria

4.4.1 Inclusion Criteria

- Records of all mothers with breech deliveries(both vaginal and cesarean)

4.4.2 Exclusion Criteria

- Lost and incomplete cards

4.5 Sample Size and Sampling Technique

4.5.1 Sample Size

All hospital records of pregnant women with a clinical diagnosis of breech presentation and gave birth at Tercha Geneal hospital during the past five years from January 1,2009 to December 31, 2013.

4.5.2 Sampling technique

All pregnancies with breech presentations will be included.

First, Obstetrics and operative records from obstetric ward and major operation registry book in the operation room was reviewed to identify women who present with breech presentation and delivered from January 1, 2009 through December 31, 2013. Next, using card no. of patients, cards was collected from the card room. Finally, based on the inclusion and exclusion criteria of the study, cards was selected and analyzed.

Chapter five: Study variables

5.1 Dependent Variable

- ❖ Fetal outcome of breech deliveries

5.2 Independent Variables

- Address
- Parity
- ANC follow up
- Gestational age
- Mode of delivery
- Weight of the newborn
- Duration of rupture of fetal membrane

5.3 Operational definitions

- ❖ **Outcome:** The intra-uterine condition of the fetus after viability (28 weeks and above) AND condition of the newborn within 5 minutes of breech fetus interms of Dead or Alive(Those alives are further expressed as healthy looking , with birth injury, asphyxiated or malformed)

◆ **Asphyxia:** Is the medical condition resulting from deprivation of oxygen to a newborn that lasts long enough during birth process of first 5 minutes that is described interms of apgar score.

- Asphyxiated for apgar <7
- Not asphyxiated for apgar 7 and above

Gestational age : The age of the fetus counting from the time of fertilization

- Pre-term for GA<37 weeks
- Term for GA 37 weeks upto 42 weeks
- Post-term GA > 42 weeks

Parity : The number of children born after 28 weeks of gestational age(could be dead or alive)

- Primipara those who gave birth only one
- Multipara those who gave birth above one one
- Grand-multi those who gave birth above five

◆ **Urban:** Resident of Tercha town

◆ **Rural:** Resident out of Tercha town.

5.4 Data collection tools and procedure

Data were collected by trained data collectors using structured pre-tested questioner checklist which was prepared in English version adapted from similar studies

5.5 Data quality management

To assure the quality of the data, data collectors and supervisors were trained and a regular supervision and follow up was made by Supervisor and PI. In addition regular checkup for completeness and consistency of the data was made on daily basis

5.6 Data analysis

The collected data were checked for its completeness, entered using SPSS version 16.0 database programs for analysis after edition. Descriptive statistics were used to describe the study sample.

Data analysis and association tables between variables were done to assess the relative effect of determinants. Association between dependent and independent variables was checked by using binary and multivariate logistic regression(P value <_ 0.05 were used

5.7 Ethical consideration

Ethical clearance was obtained from Ethical committee of Jimma University College of public health and medical science post graduate research program and letter of cooperation was obtained from JUSH Administrative office. All information obtained from patients' card was anonymous.

5.8 Dissemination of Results

Having obtained the approval from Jimma University College of Public Health and Medical Sciences, the findings of this research will be disseminated to:

- Jimma University College of Public Health and Medical Sciences
- Jimma University College of Public Health and Medical Sciences Obstetric and Gynaecology Department
- Tercha General Hospital
- Dawuro Zonal health Bureau

Chapter six

Results

During the 5 years study period, a total of 111 singleton term breech deliveries were recorded out of 3567 deliveries giving the prevalence of singleton term breech deliveries in the hospital during the study period to be 3.1%. and card retrieval rate was 97%.

6.1 Demographic Pattern

Table 1 shows the socio-demographic profile of mothers attended the hospital during the past 5 years. Age distribution ranged from 16 to 39 years with mean age 26.45 and stand deviation of 3.887.

Table 1 Shows socio-demographic pattern of mothers who gave singleton breech delivery

variable	Frequency	Percent
Maternal Age		
15-19 years	16	15.1
20-24 years	32	30.2
25-29 years	41	38.7
30-34 years	13	12.3
>35 years	4	3.7
Address		
Urban	22	20.8
Rural	84	79.2
Total	106	100

Larger proportion of mothers who attended the hospital for delivery were under the age category of 20-24 years 32(30.2%) and 25-29 years 41(38.7%). With regard to residency, around 80% of these mothers were from rural and the rest were from urban.

6.2 Obstetric condition

More than half, 66 (62.3%), of the mothers parity was multiparus(2-4), 30 (28.3%) mothers were para 1 and 10(9.4%) were grandmulti. Among participants of this study, majority, 78(73.6%) of the mothers have history of ANC follow up. Out of the mothers who gave breech deliveries, 82(77.4%) of them gave birth during 37-42 complete weeks of pregnancy, 16(15.1%) before 37 complete weeks and 8(7.5%) gave birth beyond 42 complete weeks. On the other hand, among mothers with breech presentations, 66(62.3%) of them gave birth vaginally while 40(37.7%) of mothers gave birth through cesarean section. Among mothers gave birth vaginally, 60(56.6%) gave birth through assisted breech delivery and 6(5.7%) through spontaneous breech delivery. The common reasons why cesarean sections were indicated in this study are footling breech 12(11.3%), big baby 8(7.5%), cord prolapse 2(1.2%), NRFHR 8(7.5%) previous c/s scar 8(7.5%) and other including PROM 4(3.8%).

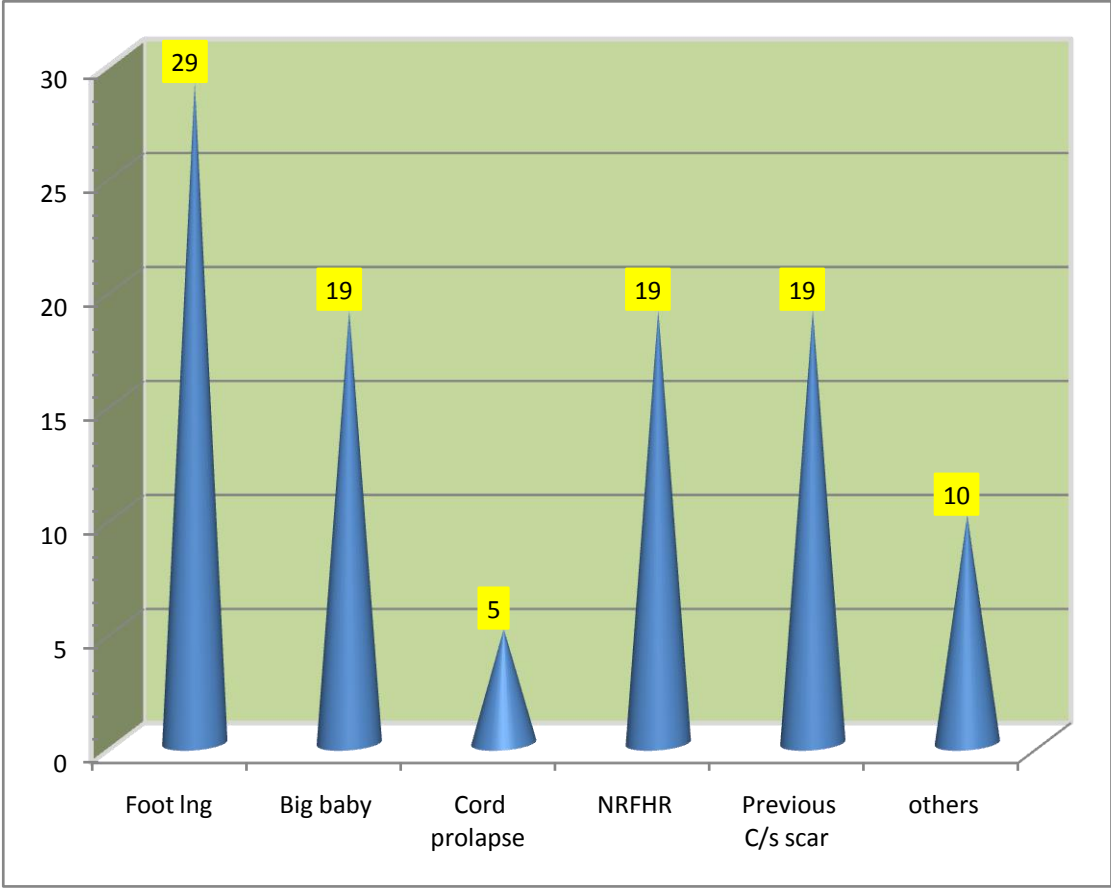
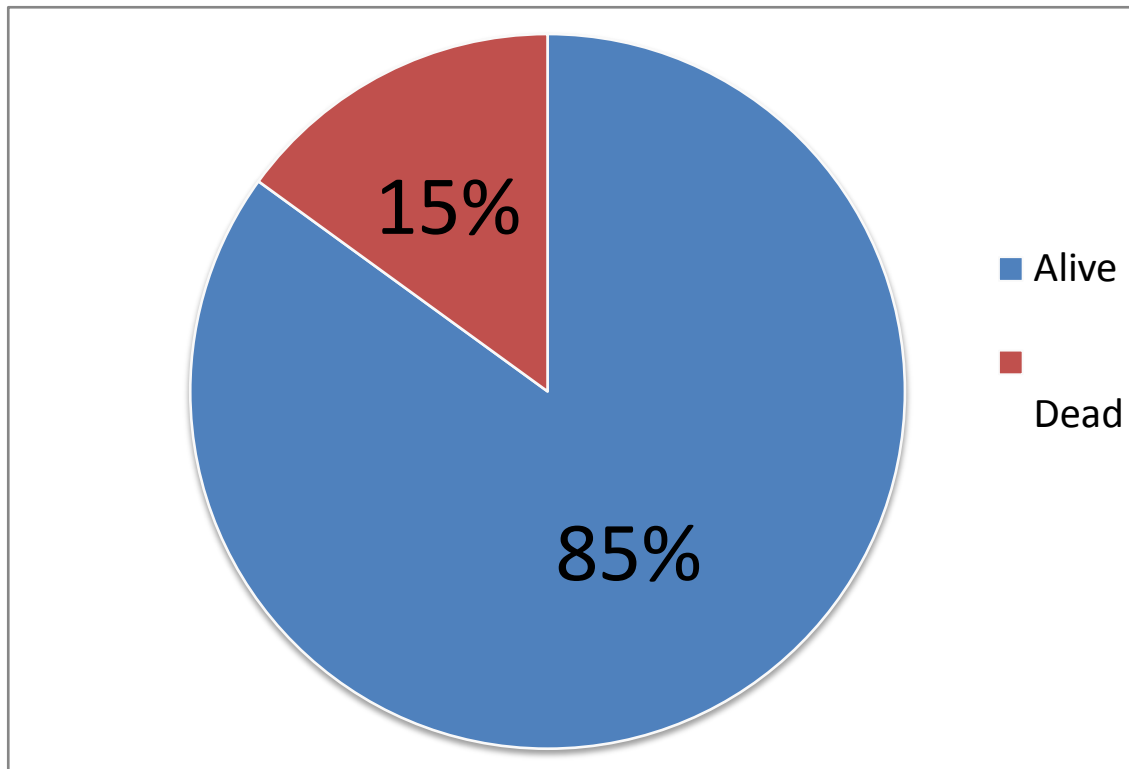


Figure 1 above Indications of cesarean section of mothers who gave birth at Tercha general hospital, January 1,2009 to December 31,2013

6.3 Fetal outcome

It was recorded in this study that, the fetal outcome of breech deliveries were 90(84.9%) born alive and 16 (15.1%) were dead (figure 2) indicating that the perinatal mortality rate to be 151 per 1000 breech presentations. Among live born, neonatal condition within the first 5 minute showed that, 56 (52.8%) born healthy, 24(22.6%) asphyxiated, 8(7.5%) born with birth injury and 2(1.9) with congenital anomaly. The possible causes of death for dead delivered fetus were entrapment of head 4 (25%), birth asphyxia 6 (37.5%), cord prolapse 2(12.5%) and intrauterine death with unknown cause 4(25%).

Figure 2 shows fetal outcome of singleton breech delivery at TGH



Among 106 newborn deliveries with breech deliveries 68(64.2%) of newborn have birth weight of 3500 gm and above, 20(18.9%) have birth weight of 2500-3500 gm and 18(17%) of new born have birth weight less than 2500gm (table 3). Of 90 live born fetus, 72(80%) had their first 5 minute Apgar score of 7 and above while 18(20%) have Apgar score of less than 7. All dead delivered fetus have Apgar score of 0.

Table 1: Binary logistic analyses for selected variables and fetal outcome of breech delivery at Tercha General Hospital, January 1 2009 to December 31, 2013 (n=106)

Variables	Fetal outcome		COR of 95% CI	P value
	Alive (per100)	Dead (per 100)		
Address				
Urban	18(16.9)	4(3.8)	0.75(0.216-2.602)	P=0.65
Rural	72(67.9)	12(11.3)	1	
Parity				
Primi para (para 1)	22(20.8)	8(7.5)	1	
Multi para (para 2-5)	58(54.7)	8(7.5)	0.379(0.127 - 1.135)	P=0.311
Grand multi para (greater than para5)	10(9.4)	0(0)	0.000(0.000)	P=0.999
ANC follow up				
Attended	76(71.7)	2(1.9)	38.12(7.77 – 18.5)	P=0.001
Not attended	14(13.2)	14(13.2)	1	
Gestational age				
preterm	12(11.3)	4(3.8)	1	
term	70(66)	12(11.3)	0.514(0.142 – 1.862)	P=0.311
Post term	8(7.5)	0(0)	0.000(0.000)	P=0.998
The status of the membrane on presentation				
Intact	52(49.1)	6(5.7)	2.281(0.234 – 6.312)	P=0.038
ruptured	38(35.8)	10(9.4)	1	
Time duration of the membrane				
Less than 12 hrs	33(31.1)	5(4.7)	0.065(0.013 - 0.337)	P=0.001
Greater than 12 hrs	3(2.8)	7(6.6)	1	
Mode of delivery				
Vaginal delivery	52(49.1)	14(13.2)	0.188(0.04 – 0.877)	P=0.033
Cesarean section	38(35.8)	2(1.9)	1	
Birth weight of new born				
Less than 2500gm	14(13.2)	4(3.8)	1	
2500-3500gm	14(13.2)	6(5.7)	0.339(0.084 – 1.362)	0.127
Greater than 3500	62	6(5.7)	3.69(1.221 – 11.15)	P=0.021

P < 0.05

Binary logistic analysis was done to show the association between fetal outcome and other independent variables. The above table 2 shows that in age group, address, parity and gestational age of the mother don't have significant statistical association with fetal outcome at CI 95% ($p > 0.05$). ANC follow up has significant statistical association with fetal outcome

($p=0.001$). Mothers who have ANC follow up have 38 times less likely chance to have fetal loss when compared with mothers who has no ANC follow up (COR= 38.12 CI 95% 7.77 – 18.5).

Status of membrane on presentation has no significant statistical association with fetal outcome ($p>0.05$). Duration of rupture of membrane has significant statistical association with fetal outcome ($p=0.001$). Mothers with duration of rupture of membrane less than 12hrs has 6.5% less likely to have fetal loss. Mode of delivery has significant statistical association with fetal outcome ($P=0.033$). Mothers who gave birth with vaginal deliveries have 18.8% chance to develop fetal loss than mothers who gave birth through cesarean section. (COR=0.188 CI 95% 0.04 -0.877).

Fetal weight of 3500gm has significant statistical association with fetal outcome ($p=0.003$) when we compare with fetal outcome of less than 2500gm. But fetal birth weight 2500gm to 3500gm have no significant statistical association with fetal outcome. Fetal weight of 3500gm has 3 times more likely to have fetal loss than those with 2500gm to 3500gm.

Table 2: Multivariate analysis for selected variable and fetal outcome of breech delivery in Tercha General Hospital, January 2009 to December 31, 2013

Variables	Fetal outcome		COR of 95% CI	AOR of 95% CI	P value
	alive	dead			
Mode of delivery					
Vaginal delivery	52(49.1)	14(13.2)		0.903(0.042-19.626)	0.998
Cesarean section	38(35.8)	2(1.9)		1	
Birth weight of new born					
Less than 2500gm	14(13.2)	4(3.8)		1	
2500-3500gm	14(13.2)	6(5.7)		0.734(0.45-5.364)	0.112
Greater than 3500	62(58.5)	6(5.7)		0.867(0.098 – 2.678)	0.243
ANC follow up					
Attended	76(71.7)	2(1.9)		35.142(7.042 – 17.537)	0.001
Not attended	14(13.2)	14(13.2)		1	
Duration of rupture of membrane					
<12hrs	33(31.1)	5(4.7)		0.8761(0.097 – 3.123)	0.998
>12hrs	3(2.8)	7(6.6)		1	

Numerous associations were found to be significant in the binary analysis. Therefore, a Multivariate approach was applied to determine which factors best explained and predict fetal outcome of breech delivery. Consequently among all ANC follow up was found to have significant statistical association with fetal outcome of breech delivery (P=0.001, AOR=35.142 95% CI 7.042-17.537). Mothers who have ANC follow up are 35 times less likely to have fetal loss than those without ANC follow up.

CHAPTER SEVEN

Discussion

The prevalence of singleton breech delivery in this study is 3.1%. It is lower than the 4% reported by study in Yekatit hospital, Ethiopia, 1989-1992(22) but higher than the 2.6 % reported from a University teaching hospital of eastern Nigeria(28). However, it is still the same to the 3-4%, which was quoted as the worldwide prevalence (1).

The general mortality rate of the newborns in this study is 151/1000 breech deliveries which is lower than 330 per 1000 deliveries reported from study in Yekatit Hospital and that of University of Calabar Teaching Hospital, southeastern Nigeria 158 per 1000 breech deliveries (22,23). But it is higher than that of study done at maternity and child hospital in Basra, Iraq, from 1 September 2005 to 31 August 2006 that was 91/1000 breech deliveries (31).

In this study, most fetal loss was related to vaginal delivery when compared with cesarean section (13.2% and 1.8% respectively). It is similar to study done at Free University Hospital, Amsterdam, the Netherlands where vaginal delivery turned out to be associated with a significantly higher incidence of fetal loss as compared to cesarean section. Similar results were demonstrated in a study conducted in Basra Iraq also vaginal delivery *versus* cesarean delivery (8.2% and 0.6% respectively)(19,31). This might be related to vaginal deliveries have high risk of fetal morbidity and mortality during birth process().

In this study birth weight 3500gm and above has high risk for fetal loss which is similar with study conducted in Basra Iraq where the majority of fetal deaths are associated with weight greater than 3500gm. But research conducted in Yekatit hospital shows birth weight less than 2500gm as high risk for fetal loss(22,31).

In this study the majority of fetal deaths are attributed to those mothers without antenatal care follow up. This result is similar with study done in Yekatit hospital showing a two-fold increase in perinatal death in patients without antenatal care (31). This could be due to the fact that having antenatal care follow up has significant effect in reducing fetal death irrespective of the fetal presentation (1).

Birth asphyxia is the leading possible cause of fetal death in this study. This is different with study conducted in Nigeria (23) and Yaoundé Cameroon were the leading cause of fetal deaths are related with entrapment of after coming head and birth injury respectively (26). This could be related to delay to reach the hospital because the majority of the mothers are from rural.

7.2 Strength and limitations of the study

7.2.1 Strength of the study

- Relatively inexpensive

7.2.2 Limitation of the study

Since the study is based on secondary data, some information's may not be complete. The study does not show long term complications

CHAPTER EIGHT

Conclusion and Recommendations

8.1 Conclusion

- ❖ The prevalence of singleton breech delivery in this study is 3.1% that is comparable with the standard.
- ❖ The fetal (perinatal) mortality is 151/1000 breech deliveries showing higher number than the national report.
- ❖ ANC follow up is found to be the most important independent factor affecting the fetal outcome of breech deliveries.
- ❖ Vaginal breech delivery has high fetal death as compared to cesarean delivery.

8.2 Recommendations

The following recommendations are made based on this study:

- Efforts need to be intensified in all aspects to minimize the reported higher number of the perinatal (fetal) mortality of breech deliveries
- ANC follow up should be given more emphasis than before
- I recommend further study by experts on this issue

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Annex I

Data collection format

This questioner will be designed to assess fetal outcome of breech delivery in TGH for the last 5 years from January 1, 2009 to December 31, 2013

I. Demographic Background

1. Age _____
2. Address
 1. Urban
 2. Rural
3. Marital status
 1. Married
 2. Single
 3. Widowed
 4. Divorce

II. Obstetrics condition

1. Parity
 1. Primi para
 2. Multipara
 3. Grand multi para
2. ANC follow up
 1. Attended
 2. Not attended
3. Gestational age during delivery
 1. Preterm
 2. Term
 3. Post term
4. Cervical dilatation on time of arrival to hospital
 1. Fully dilated
 2. Not fully dilated
 3. Closed
5. Condition of the membrane on presentation
 1. Intact
 2. Ruptured
6. For question no.7 if membrane ruptured time duration of rupture
 1. Less than 12 hours
 2. Greater than 12 hours

7. Mode of delivery
 1. Spontaneous breech delivery
 2. Assisted breech delivery
 3. Caesarian Delivery
 4. Destructive delivery
8. Indication for c/s
 1. Big baby
 2. Footling breech
 3. Fetal distress
 4. Previous c/s scar
 5. PROM

III. Fetal condition

1. Intrauterine fetal condition
 1. Alive
 2. Dead
2. Fetal outcome immediate after delivery
 1. Alive
 - 2 . Dead
3. For question no.2 if alive fetal condition with in first 5 minute
 1. Healthy looking
 2. With birth injury
 3. Asphyxiated
 4. with congenital anomaly
4. For question no 2 if dead possible cause of death
 1. After coming head entrapment
 2. Cord prolapse
 3. Asphyxia
 4. Other
5. If alive APGAR score the neonate at 5th minute
 1. 0
 2. >7
 3. <7
6. Neonatal birth weight
 1. less than 2500gm
 2. 2500 – 3500gm
 3. greater than 3500gm

Assurance of Principal Investigator

I undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and condition of the Faculty of Public Health in effect at the time of grant is forwarded as the result of this application.

Name of the student: Morki Wabe

Date.....

Signature.....

APPROVAL OF ADVISORS

1. Mr. Gugsa Namera

Date.....

Signature.....

2. Mr. Garuma Tolu

Date.....

Signature.....