Prevalence and Perinatal Outcome of Singleton Term Breech Delivery in Mizan Aman General Hospital, South West, Ethiopia; A Three Year Retrospective Hospital based Study

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Abstract

Introduction: Breech deliveries have always been topical issues in obstetrics because of the very high perinatal mortality and morbidity. These are due to combination of trauma, birth asphyxia, prematurity and malformation. Neonates undergoing term breech deliveries have long-term morbidity up to the school age irrespective of mode of delivery.

Objective: To determine the perinatal outcome of singleton term breech deliveries and identify associated factors at Mizan Aman General Hospital.

Methods: Hospital based cross-sectional study was conducted. Data on Socio-demographic, obstetric conditions and outcome of singleton breech deliveries of all pregnant women was collected from January 01, 2012 to December 31, 2014 GC. The collected Data was entered to SPSS version-20 for analysis. Descriptive statistics was run and the association between independent and dependent variables was measured using logistic regression model and p-value < 0.05 statistically significant.

Result: During the 3 years study period, a total of 126 singleton term breech deliveries were recorded out of 3729 deliveries giving the prevalence of singleton breech deliveries in the hospital to be 3.4%. The perinatal outcome of breech deliveries were 104(88%) born alive and 14(12%) were dead indicating that the perinatal mortality rate to be 120 per 1000 term breech presentations. The possible causes of death for dead delivered fetus were entrapment of head 5(35.7%), prolapsed cord 4(28.6%), birth asphyxia 3(21.4%) and intrauterine death with unknown cause 2(14.3%). Birth weight greater than 3500 gm have 26% chance of fetal loss when compared with fetal weight 2500-3499 gm. Vaginal breech delivery have significant statistical association with perinatal loss than abdominal route.

Conclusion and Recommendation: Perinatal mortality rate, of 120 per 1000 breech deliveries. Which indicate that breech vaginal delivery is associated with an increased perinatal mortality and morbidity than caesarean delivery. Birth weight ≥ 3500 gm increase risk perinatal loss than fetal weight between 2500-3499 gm.

Keywords: Perinatal outcome; Breech delivery; Associated factors

Introduction

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. This presentation occurs in 3 to 4 percent of labors overall, although it is found in 7 percent of pregnancies at 32 weeks and in 25 percent of pregnancies of less than 28 weeks’ duration [1].

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. Breech presentation may be caused by an underlying fetal or maternal abnormality, or may be an apparently chance occurrence, or related to an otherwise benign variant such as cornual placental position.

The predisposing factors include Polyhydramnious, Oligohydramnious, Uterine anomalies, Pelvic tumors (myoma, ovarian neoplasm etc), CPD, Placenta previa, Cornual placenta, Multiple pregnancy, Anencephaly, Hydrocephaly and other fetal anomalies, IUFD and Uterine relaxation associated with high parity [2].

Breech deliveries have always been topical issues in obstetrics because of the very high perinatal mortality and morbidity. These are due to combination of trauma, birth asphyxia, prematurity and malformation [3].

In addition 19.4% of neonates undergoing term breech deliveries have long-term morbidity up to the school age irrespective of mode of delivery [4]. Thus wide ranges of management policies have been instituted with the aim of reducing this perinatal morbidity and
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.

The breech scoring system of Zatuchinis and Andros also provide useful guidelines for assessment of the likely outcome of vaginal breech delivery [8]. The problem is further compounded in our environment, where only a small percentage of pregnant women assess the available antenatal services and many of the present to the hospital in advanced stages of labor or with intra-uterine fetal death [9]. Hence only a few of them benefit from planned vaginal breech delivery [10].

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. 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.

This was the reason the Royal College of Obstetricians and Gynaecologists in 2001 [11], 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 2 where ECV are practiced when compared to units that avoid it [12].

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.

Methods and Materials

Study area

The study was conducted at Mizan Aman general hospital, SNNPR, South west Ethiopia, which is about 574 kilometers from Addis Ababa. The zone has 33 health centers which are government owned and Mizan Aman General Hospital which is used as general hospital and owned and run by the Government (Mizan Aman Town health Administration Office, 2011).

The total population of the Bench Maji zone is 760, 314; of which 381, 449 are males and 378, 865 are Females. The hospital gives a general service for different parts of the zone. The average delivery service in a month in 2011 was about 100.

The hospital was established in 1979 E.C and it is the only general hospital in the zone that service for many peoples. It has 136 beds. The Hospital has labor and delivery room (32 beds and 2 delivery coaches) which give services for parturient mother. The room operates with multidisciplinary staffs.

Study design

Institutional based cross sectional study was conducted.

Population

Source population: All mothers who gave birth in Mizan Aman General Hospital.

Study population: All mothers who gave birth for singleton term breech deliveries in Mizan Aman General Hospital from January 01/2012 to December 31/2014 GC and fulfilling inclusion criteria.

Inclusion criteria

All Women who gave birth of singleton term breech deliveries in Mizan Aman General Hospital (term was considered using LNMP, early ultrasound, early HCG, fetal biometrics (femoral length, biparietal diameter).

Exclusion criteria

- All Mothers who gave multiple birth.
- Mothers with abortion and preterm breech deliveries.
- Lost and incomplete cards.

Maternal conditions which will affect fetal outcome (mothers with chronic medical illnesses and obstetric complications like preeclampsia, APH, sepsis).

Sample Size

All clinical record of mothers with the diagnosis of term breech singleton birth at Mizan Aman General Hospital during the period of January 01/2012 to December 31/2014 E.C.

Data collection Procedure

First, Obstetrics and operative records from obstetric ward and major operation registry book in the operation room will be reviewed to identify women who gave birth for breech presentation from January 1, 2012 through December 31, 2014. Next, using card number of patients, cards was collected from the card room. Finally, using structured checklist data on socio-demographic factors, obstetric conditions and foetal outcomes was collected from charts which fulfil inclusion criteria of the study by trained data collectors (midwives).

Variables

Dependent variables

- Perinatal outcome of singleton term breech deliveries
- Alive
- Dead

Independent variables

- Age
- Address
- Parity
- Route of delivery
- ANC
- Status of membrane
- Duration of rupture of membrane
- Types of breech
- Birth weight
Data Processing and Analysis

The collected data was checked for its completeness and entered to SPSS version-20 database program for analysis. Descriptive statistics of both dependent and independent was worked out and the association measured and tested using logistic regression. The processed Data was presented using Odds Ratio with their 95% CI and p-value < 0.05 taken as statistically significant (Figure 1).

Data Quality Management

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

Result

Demographic pattern

The age distribution ranged from 17 to 40 years with mean age 25.68 years with standard deviation of 4.818. Larger proportion of women that attended the hospital for delivery were under the age category of 20-24 years 43(36.4%) and 25-29 years 47(39.8%). With regard to residency, 44.1% of these mothers reside in Mizan Aman and Teppi town and the rest 55.9% were out of that. All mothers enrolled in this study were married (Figure 1) (Table 1).

| Residence                  | Frequency | Percent |
|----------------------------|-----------|---------|
| Mizan Aman and Teppi       | 52        | 44.1    |
| Out of Mizan Aman and Teppi| 66        | 55.9    |
| Total                      | 118       | 100     |

Table 1: Socio-demographic characteristics of mothers gave singleton term breech delivery at Mizan Aman Hospital from January 1, 2012 to December 31, 2014 (n=118).

Obstetrics condition

In this study, 68(57.6%), of the mothers parity was multiparous, among this 9(7.6%) are grand multiparous (≥5) while the remaining 50(42.4%) mothers were primiparous. Among participants of this study, majority, 105(89%) of the mothers have history of ANC follow up.

On the other hand, among mothers with term breech presentations, 67(56.8%) of them gave birth vaginally while 51(43.2%) of mothers gave birth through cesarean section. Among mothers who gave birth vaginally, 59(50%) gave birth through assisted breech delivery, 5(4.2%) through spontaneous breech delivery and 3(2.5%) were destructive deliveries.

The common reasons cesarean section to be indicated for mothers whose gave birth in this study were big baby 15(12.7%), footling breech 13(11%), cord prolapse 6(5.1%), non-reassuring fetal heart rate pattern 6(5.1%), previous c/s scar 5(4.2%) and other including PROM 6(5.1%) (Table 2).

| Indication for c/s          | Frequency | Percent (%) |
|-----------------------------|-----------|-------------|
| Big baby                    | 15        | 12.7        |
| Footling breech             | 13        | 11          |
| Cord prolapse               | 6         | 5.1         |
| Non reassuring FHR          | 6         | 5.1         |
| Previous c/s scar           | 5         | 4.2         |
| Others including prom       | 6         | 5.1         |

Table 2: Frequency distribution of indications for cesarean deliveries of term singleton breech presentations in Mizan Aman Hospital from January 1/2012-December 31/2014.

Perinatal outcome

It was recorded in this study that, the perinatal outcome of breech deliveries were 104(88%) born alive and 14(12%) were dead indicating that the perinatal mortality rate to be 120 per 1000 term breech presentations.

Among live born, neonatal condition within the first 5 minute showed that, 81(73%) born healthy, 27(24.3%) asphyxiated and 3(2.7%) born with birth injury (Figure 2).
The possible causes of death for dead delivered fetus were entrapment of head 5(35.7%), cord prolapse 4(28.6%), birth asphyxia 3(21.4%) and intrauterine death with unknown cause 2(14.3%).

As shown on the Figure 2 Among 118 newborn deliveries with breech deliveries 66(55.9%) of newborn have birth weight of 2500-3499 gm, 44(37.3%) have birth weight of 3500 gm and above and the remaining 8(6.8%) of newborn have birth weight less than 2500 gm. Of 108 live born fetus, 81(68.6%) had Apgar score of greater than 7 while 27(22.9%) have Apgar score of less than 7 at 1st minute of life and 3(2.5%) were with birth injuries. All dead delivered fetuses have Apgar score of 0. With subsequent evaluation among 108 live births 89(82.4%) scored 7 and above, 15(13.9%) less than seven and 4(3.4%) of them were dead (0 Apgar) (Table 3).

### Table 3: Fetal outcome of singleton term breech deliveries in Mizan Aman Hospital from January 1, 2012 to December 31, 2014 (N=118).

| Variables                              | Frequency | Percent (%) |
|----------------------------------------|-----------|-------------|
| Intrauterine fetal condition           |           |             |
| Alive                                  | 111       | 94.1        |
| Dead                                   | 7         | 5.9         |
| Fetal condition immediately at birth   |           |             |
| Alive                                  | 108       | 91.5        |
| Dead                                   | 3         | 2.5         |
| Fetal condition with in 5 minute       |           |             |
| Health looking                         | 81        | 75          |
| Asphyxiated                            | 27        | 22.9        |
| With birth injury                      | 3         | 2.5         |
| Apgar score at 5th minute              |           |             |
| 0                                      | 4         | 3.4         |
| ≥7                                     | 89        | 75.4        |
| <7                                     | 15        | 13.9        |
| If dead possible causes                |           |             |
| Entrapment of after coming head        | 5         | 35.7        |

As described in Table 6 below that age group, residence, parity and duration of rupture of membrane of the mother with singleton term breech delivery haven't significant statistical association with perinatal outcome at CI 95% (p >0.05). ANC follow up, Status of membrane on presentation and footling breech have significant statistical association with perinatal outcome (p-value = 0.036, 0.022 and 0.021 respectively) (Table 6).
| Variables | Perinatal Outcome | COR 95% CI | P-Value |
|-----------|------------------|------------|---------|
| Age(Years) |                  |            |         |
| 15-19     | 4(3.4)           | 1(0.8)     | 1       |
| 20-24     | 38(32.2)         | 5(4.2)     | 0.53(0.05-5.70) | 0.597 |
| 25-29     | 45(38.1)         | 2(1.7)     | 0.18(0.01-2.42) | 0.194 |
| 30-34     | 11(9.3)          | 3(2.5)     | 1.09(0.09-13.78) | 0.946 |
| >=35      | 6(5.1)           | 3(2.5)     | 2.00(0.15-26.73) | 0.6   |
| Address   |                  |            |         |
| Mizan Aman and Tepi | 47(39.8) | 5(4.2) | 1 |
| Out of Mizan and Tepi | 57(48.3) | 9(7.6) | 0.67(0.21-2.145) | 0.504 |
| Parity    |                  |            |         |
| Primipara(1) | 42(35.6) | 8(6.8) | 1.52(0.17-13.92) | 0.709 |
| Multipara(2-4) | 54(45.8) | 5(4.2) | 0.74(0.08-7.18) | 0.796 |
| Grand multipara(≥5) | 8(6.8) | 1(0.8) | 1 |
| ANC follow up |          |            |         |
| Attended   | 95(80.5) | 10(8.5) | 1 |
| Not attended | 9(7.6) | 4(3.4) | 4.22(1.10-16.22) | 0.036 |
| Status of membrane on presentation |         |            |         |
| Intact     | 65(55.1) | 4(3.4) | 1 |
| Raptured   | 39(33.1) | 10(8.5) | 4.17(1.22-14.19) | 0.022 |
| Duration of membrane rupture |        |            |         |
| Less than 12 hrs | 25(51) | 6(12.2) | 1 |
| Greater than 12 hrs | 14(28.8) | 4(8.2) | 0.84(0.20-3.49) | 0.81 |
| Type of breech |          |            |         |
| Frank breech | 53(44.9) | 4(3.8) | 1 |
| Complete   | 44(37.3) | 7(5.9) | 2.11(0.58-7.67) | 0.258 |
| Footling breech | 5(4.2) | 3(2.5) | 7.95(1.37-46.00) | 0.021 |
| Route of delivery |         |            |         |
| Vaginal    | 55(46.6) | 12(10.8) | 5.35(1.14-25.08) | 0.034 |
| Abdominal  | 49(41.5) | 2(1.7) | 1 |
| Birth weight |          |            |         |
| <2500 gm   | 5(4.2) | 3(2.5) | 6.00(1.14-31.53) | 0.698 |
| 2500-3499 gm | 60(50.8) | 6(5.1) | 1 |
| ≥3500 gm   | 39(33.1) | 5(4.2) | 1.28(0.37-4.49) | 0.034 |

Table 6: Binary logistic analyses for selected variables and fetal outcome of breech delivery at Mizan Aman Hospital, January 1, 2012 to December 31, 2014 (n=118).
On the other hand, Route of delivery has significant statistical association with perinatal outcome and birth weight greater than 3500 gm have significant statistical association with perinatal mortality (p=0.034).

Since most of the associations were found to be significant in the binary analysis, a Multivariate approach was applied to determine best predictor of perinatal outcome of breech delivery. Independent variable like mode of delivery and birth weight were found to be significant on multivariate analysis. Vaginal breech delivery have significant statistical association with 35% increased perinatal mortality than abdominal route (p= 0.014(AOR=0.35(0.15-0.813)). New born birth weight greater than 3500 gm have significant statistical association with perinatal outcome when we compare with perinatal weight between 2500 gm to 3500 gm. Having birth weight greater than 3500 gm 26% chance of fetal loss when compared with fetal weight less than 2500-3500 gm ((p=0.013,AOR=0.26(0.09-0.75)). But fetal weight less than2500 gm have no significant statistical association with perinatal outcome than birth weight 2500-3500 gm. (p= 0.191) (Table 7).

**Discussion**

During 3 years study period, a total of 126 singleton term breech deliveries were recorded out of 3729 deliveries giving the prevalence of singleton breech deliveries in the hospital during the study period to be 3.4%

Among this 126 term breech deliveries 3(2.2%) and 5(3.7%) are with congenital anomaly and incomplete cards respectively. The prevalence of singleton term breech delivery in this study is 3.4% which is lower than the study done in Yekatit 12 Hospital, Addis Ababa, Ethiopia, with a 4% incidence in the study period of 1989-1992, but it is higher than the study done in a University Teaching Hospital in Eastern Nigeria, having prevalence of 2.6% over all it is comparable with worldwide incidence of 3-4% [13-15].

In this study the perinatal mortality rate is 120 per 1000 term breech presentations. It is lower than study done in Yekatit 12 Hospital, Ethiopia; perinatal mortality rate for breech delivery was 330 per 1,000 deliveries, 194.3 per 1000 deliveries on study done in Black Lion hospital and less than 2% on study done in Canada. On similar study conducted in teaching hospital of eastern Nigeria the perinatal mortality rate was 250 in 1000 deliveries. This study suggests perinatal death is of breech delivery is higher than general perinatal death 11.4% of study done in Jimma specialized hospital on 2011.

Risk of perinatal mortality in breech delivery is higher in vaginal route than cesarean section, 10.8% and 1.7% respectively. This shows perinatal mortality of singleton breech delivery is higher in this study on both routes when compared with the study conducted in Basra, Iraq the perinatal mortality in vaginal deliveries (8.2%) while 0.9% in cesarean deliveries. This might be related to vaginal deliveries have high risk of perinatal morbidity and mortality during birth process [2]. In addition birth trauma was 2.5% which is restricted to vaginal delivery similar to the study conducted in Basra, Iraq. When we see route of breech delivery with their 5th minute Apgar score of live born, 11% and 6.4% had less than seven through vaginal and abdominal routes respectively. Compared to research done at the Yaoundé General Hospital, Cameroon, infants born by cesarean section and those delivered vaginally have low 5-minute Apgar scores 4.1% vs. 17.77% [15-17].

| Variables | Fetal Out Come | COR Of 95% CI | AOR Of 95% CI |
|-----------|----------------|---------------|---------------|
|           | Alive No (%)   | Dead No (%)   |               |
| ANC Follow Up |                  |               |               |
| Attended   | 95(80.5)       | 10(8.5)       | 1             |
| Not attended | 9(7.6)         | 4(3.4)        | 4.22(1.10-16.22) | 3.82(0.72-20.43) |
| Status of membrane on presentation |            |               |               |
| Intact     | 65(55.1)       | 4(3.4)        | 1             |
| Raptured   | 39(33.1)       | 10(8.5)       | 4.17(1.22-14.19) | 3.49(0.86-14.12) |
| Type of breech |               |               |               |
| Frank breech | 53(44.9)      | 4(3.8)        | 1             |
| Complete   | 44(37.3)       | 7(5.9)        | 2.11(0.58-7.67) |
| Footling breech | 5(4.2)       | 3(2.5)        | 7.95(1.37-46.00) | 1.41(0.26-7.57) |
| Route of delivery |            |               |               |
| vaginal    | 55(46.6)       | 12(10.8)      | 5.35(1.14-25.08) | 0.35(0.154-0.81) |
| abdominal  | 49(41.5)       | 2(1.7)        | 1             |
| Birth weight |               |               |               |
| <2500 gm   | 5(4.2)         | 3(2.5)        | 6.00(1.14-31.53) | 3.10(0.57-16.91) |
| 2500-3499 gm | 60(50.8)      | 6(5.1)        | 1             |
| ≥3500 gm   | 39(33.1)       | 5(4.2)        | 1.28(0.37-4.49) | 0.26(0.09-0.75) |

**Table 7:** Multivariate analysis for selected variable and fetal outcome of singleton breech delivery in Mizan Aman Hospital from January 2012 to December 31, 2014.

In this study newborns weigh less than 2500 gm has high risk of perinatal mortality rate 37.5 per 100 deliveries and new born who weighs more than 3500 has still 11 per 100 risk of perinatal loss. This figure is relatively lower than the study conducted in Yekatit 12 hospital, Ethiopia, with perinatal mortality of 635 and 156 per 1000 for fetuses weighs less than 2500 gm and greater than 2500 gm respectively. But the study conducted in Basra, Iraq, shows higher perinatal mortality record among infants >3500 gm birth weight [16].

Entrapment of after coming head is the leading possible cause of perinatal death. This is the same with study conducted in Nigeria [15]. But research done Yaoundé Cameroon the leading cause of perinatal death related with birth injury [17]. This possible cause fetal loss may be related with delay to reach the hospital, this due to large proportion of participants were away from Mizan and Teppi town.

**Limitation of the Study**

Since the study was facility based review, to draw inferences to the wider community can be difficult. The study didn't show long term complications.

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Conclusion and Recommendations

Conclusion

In this study, it can be concluded that the perinatal mortality rate, of 120 per 1000 breech deliveries, which indicates that breech vaginal delivery is associated with an increased perinatal mortality and morbidity than caesarean delivery.

Factor such as fetal weight ≥ 3500 gm and vaginal route of breech delivery are significantly associated with increased perinatal mortality. In this study Entrapment of head, birth asphyxia and cord prolapse were the most common causes of perinatal mortality.

Recommendation

Based on the findings of this study the following recommendations are forwarded:

Because of vaginal breech delivery has high perinatal death, better to update our protocol of all term breech delivery with caesarean section. Prenatal and intrapartum evaluation for fetal presentation, weight, wellbeing and other parameters to decide on route of breech delivery should be performed as routine activities.

Ethical Consideration

Initially ethical approval and permission was obtained from Research Ethical Committee of Jimma University. The coordinator of Integrated Emergency Obstetrics/Gynecology and General Surgery was communicated through formal letters which was taking from before the study. The supportive staffs (i.e. Card room workers and obstetric ward staffs) were informed about the purpose of the study and verbal consent was obtained.

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