Feto-Maternal Outcomes of Term Assisted Breech Deliveries at the University Teaching Hospital, Lusaka, Zambia

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ABSTRACT

Background: Breech presentation occurs when the fetus presents with buttocks or feet first. Globally, the incidence of breech is 3-4% at term. The safest mode of delivery for most breeches at term is still controversial despite extensive research. The aim of this study was to determine the feto-maternal outcomes of assisted term breech deliveries at the University Teaching Hospital (UTH).

Methods: A cross sectional study was conducted in 73 pregnant women with term breech admitted to the labor ward that delivered vaginally. Data was collected by administering a structured questionnaire and from medical records. The Pearson's chi-squared test was used for comparison of proportions between groups. One multivariate logistic regression was used to determine associations with neonatal intensive care unit (NICU) admission and also a second one associations with type of breech.

Results: The mean age of the participants was 30.6 ± 5.5 (range 18-41) years. The mean gestational age at delivery was 38.6 weeks and mean parity was 3.4, with a 5% history of previous breech. The average levels of asphyxia measured by Apgar score were 7.1 at 1 minute, 8.1 at 5 minutes and 8.6 at 10 minutes. The average fetal weight was 3200g, with 10% admissions to Neonatal intensive care unit(NICU). For the maternal outcomes, one participant had post-partum haemorrhage (PPH), and one participant had an episiotomy and none had symphysiotomy.

On multivariate analysis, NICU admission was associated with lower Apgar score at 1 minute. Babies that were not admitted to NICU had 90% reduced odds for low Apgar score < 7 [Adjusted Odds Ratio (OR) = 0.10, 95% Confidence Interval (CI) = 0.004 – 0.24, P-value < 0.01. Also, on multivariate analysis, type of breech was associated with lower Agpar score at 5 minutes. Compared to footling breech, patients with extended breech had 97% reduced odds for low Apgar score < 7 (OR 0.03, 95% CI 0.004 – 0.22, p-value < 0.01). Patients with complete breech had 85% reduced odds for lower Apgar score < 7 (OR 0.15, 95% CI 0.05 – 0.44, p-value < 0.01).

Discussion and Conclusion: Feto-maternal outcomes of assisted term vaginal breech deliveries at UTH were favourable with low levels of asphyxia, neonatal admissions to NICU, and need for blood transfusion. Therefore, breech vaginal delivery at term may still be a viable option at UTH as demonstrated by this study.

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INTRODUCTION

Breech presentation at term is fairly common at the University Teaching Hospital (UTH), Lusaka, with estimated incidence of 3% from 2012 labor ward register. Globally, the incidence is 3-4% at term. Most of these cases are actually un investigated as they present to UTH labor ward for the first time in labor as clinic referrals, although majority of them end up delivering vaginally in contrast to international recommendations. The best mode of term breech delivery is still controversial despite extensive research. Since the publication of the Term Breech Trial (TBT 2000)[1] there had been a dramatic change worldwide from selective vaginal delivery to planned caesarean section for women with a breech presentation at term[2-3]. The major world policy making bodies recommended caesarean delivery for term breech.[4-5] Although revised guidelines[6-7] of the Royal and American colleges of Obstetricians and Gynecologists now both have a role for vaginal delivery (after follow up publication of the TBT 2004), caesarean section has been suggested as way of reducing the perinatal problems and in many countries in Northern Europe and North America, it has become the normal mode of breech delivery. However, in some parts of the world some practitioners have supported trial of vaginal delivery based on their favourable outcomes. This group also feels that caesarean delivery is associated with increased maternal morbidity.[9-10-11] In Nigeria, Africa term vaginal breech deliveries were associated with poorer fetal outcomes as opposed to caesarean delivery.[12]

The feto-maternal outcomes of the vaginal breech deliveries conducted at UTH are not known, despite most of them not meeting the standard criteria for vaginal delivery. Therefore the aim of this study was to determine the fetal and maternal outcomes of assisted term breech deliveries at UTH.

METHODS

A cross sectional study was conducted at the University Teaching Hospital labor ward from Feb to May 2016. Pregnant women with term breech admitted to the labor ward that delivered vaginally were recruited in the study. All data were entered in an Excel spreadsheet before importing to statistical software package SPSS version 21 for analysis. All statistical tests were at 5% significance level. The Pearson's chi-squared test was used for comparison of proportions between groups. The Fisher's exact test was used when one or more of the cells had an expected frequency of five or less. Study variables were checked for evidence of collinearity based on a Spearman or Pearson correlation coefficient > 0.8. Selection for logistic regression model was considered at level $p < 0.20$ or known clinical significance. Backward selection method was used to obtain the final logistic regression model for predicting outcome variable of interest. The backward selection method removes terms one at a time beginning with the largest p-value and continuing until all remaining effects are significant at a specified level or removing more terms results in poorer fit.

RESULTS

A total of 73 patients were studied and their characteristics are tabulated in table1. The mean age of the participants was 30.6 ± 5.5 years (18 to 41 years). A greater proportion of the study mothers, 63/73 (86.3%), were not employed however 65/73 (89%) had some form of education. Many of the patients, 61/73 (83.6%), had no adequate income and about half of the study mothers, 36/73 (49.3%), were from high density locations. Most of the study patients, 69/73 (94.5%), had no history of breech. About three-quarters of the breech diagnosis, 55/73 (75.3%), were made by physical examination, 5/73 (6.8%) were made by obstetric ultrasound, and 13/73 (17.8%) were undiagnosed (seen on delivery). The study population had a mean parity of 3.4 (range between 1 to 9) with a 5% history of previous breech. The most common type of breech was extended, 35/73 (47.9%), followed by complete breech, 30/73 (41.1%), and footling 8/73 (11.0%). Slightly over half of the patients had duration of active second

stage between 15 – 30 minutes, 39/73 (53.4%). There were 19/73 (26.0%) patients with duration less than 15 minutes, and 15/73 (20.5%) with duration between 30 – 45 minutes. There were 22/73 (30.1%) patients who were delivered by certified midwives, 19/73 (26%) delivered by registered midwives, and 32/73 (43.8%) by doctors.

A greater proportion of the babies had Apgar score at 1 minute greater than 7, 60/73 (82.2%). At 5 minutes, there were 66/73 (90.4%) with Apgar score 7 or greater. There were, however, 59/73 (80.8%), babies with Apgar score 7 or greater at 10 minutes. There were 27/73 (37%) babies with birth weight between 2.5 – 3.4 Kg, 38/73 (52.1%) between 3.5 – 4.0 Kg, and 8/73 (11%) with birth weight above 4.0 Kg. There were only 7/73 (9.6%) babies that were referred to the NICU. The mean birth weight was 3.2 Kg (SD = 0.35). The previous mean weight of babies from the mothers was 3.4kg (SD=0.56) which was higher (p<0.001) than the mean weight of babies delivered after breech. The mean number of antenatal visits was 2.6 (SD = 1.06) and mean parity

3.4 (SD = 1.77). For the maternal outcomes only one participant had an episiotomy and none had symphysiotomy and only one had post-partum haemorrhage (PPH). There were neither blood transfusions nor admissions to the intensive care unit and we recorded no maternal deaths after vaginal breech delivery.

Study variables are presented in tables 1 and 2 stratified by one of two variables: Apgar score at 1 minute and admission to NICU. At 5% significance level only NICU admission, income and employment status were found to be significantly associated with Apgar score at 1 minute, P-values < 0.01, < 0.01, and 0.01, respectively. The type of breech was marginally associated with NICU admission, P-value = 0.05.

Table 1: Bivariate analysis for association of study variables with Apgar score at 1 minute

Variable	n	%	Apgar Score >7 n	%	P-value
Education level					
None/Primary	4	30.8%	30	50.0%	0.21
Secondary/Tertiary	9	69.2%	30	50.0%	
Employment					
Formal/Informal	5	38.5%	5	8.3%	**0.01**
Unemployed	8	61.5%	55	91.7%	
Adequate income					
Yes	6	46.2%	6	10.0%	**< 0.01**
No	7	53.8%	54	90.0%	
Residence					
High density	5	38.5%	31	51.7%	0.39
Medium/Low density	8	61.5%	29	48.3%	
History of breech					
Yes	0	0.0%	4	6.7%	0.99
No	13	100.0%	56	93.3%	
Breech diagnosed by					
Obstetric ultrasound	1	7.7%	4	6.7%	0.08
Physical examination	7	53.8%	48	80.0%	
Undiagnosed	5	38.5%	8	13.3%	
Type of breech					
Complete	6	46.2%	24	40.0%	0.16
Extended	4	30.8%	31	51.7%	
Footling	3	23.1%	5	8.3%	
Duration of active second stage					
Less than 15min	3	23.1%	16	26.7%	0.27
15 - 30 min	5	38.5%	34	56.7%	
. .	5	38.5%	10	16.7%	
Level of operator					
Certified midwife	5	38.5%	17	28.3%	0.28
Registered midwife	1	7.7%	18	30.0%	
Medical officer	7	53.8%	25	41.7%	
Fetal weight category					
2.5 - 3.4 Kg	2	15.4%	25	41.7%	0.14
3.5 - 4.0 Kg	10	76.9%	28	46.7%	
> 4.0 Kg	1	7.7%	7	11.7%	
NICU					
NO	6	46.2%	59	98.3%	**<0.01**
Yes	7	53.8%	1	1.7%	
Fetal weight [mean, SD]	3.3, 0.29		3.2, 0.36		0.33
Gestation age (weeks) [mean, SD]	38.6, 1.56		38.6, 1.54		0.97
Number of antenatal visits [mean, SD]	2.4, 0.81		2.7, 1.12		0.42
Parity [mean, SD]	3.3, 1.93		3.4, 1.75		0.84

Table 2: Bivariate analysis for association of study variables with NICU admission

Variable	No NICU		NICU		P-value
	n	%	n	%	
Education level					
None/Primary	31	47.7%	3	37.5%	0.72
Secondary/Tertiary	34	52.3%	5	62.5%	
Employment					
Formal/Informal	57	87.7%	6	75.0%	0.30
Unemployed	8	12.3%	2	25.0%	
Adequate income					
Yes	9	13.8%	3	37.5%	0.12
No	56	86.2%	5	62.5%	
Residence					
High density	32	49.2%	4	50.0%	0.99
Medium/Low density	33	50.8%	4	50.0%	
History of breech					
Yes	4	6.2%	0	0.0%	0.99
No	61	93.8%	8	100.0%	
Breech diagnosed by					
Obstetric ultrasound	5	7.7%	0	0.0%	0.23
Physical examination	50	76.9%	5	62.5%	
Undiagnosed	10	15.4%	3	37.5%	
Type of breech					
Complete	25	38.5%	5	62.5%	**0.05**
Extended	34	52.3%	1	12.5%	
Footling	6	9.2%	2	25.0%	
Duration of active second stage					
Less than 15min	17	26.2%	2	25.0%	0.47
15 - 30 min	36	55.4%	3	37.5%	
30 – 45	12	18.5%	3	37.5%	
Level of operator					
Certified midwife	18	27.7%	4	50.0%	0.40
Registered midwife	18	27.7%	1	12.5%	
Medical officer	29	44.6%	3	37.5%	
Fetal weight category					
2.5 - 3.4 Kg	26	40.0%	1	12.5%	0.25
3.5 - 4.0 Kg	32	49.2%	6	75.0%	
> 4.0 Kg	7	10.8%	1	12.5%	
Apgar score at 1 minute					
0-6	6	9.2%	7	87.5%	< 0.01
7 and above	59	90.8%	1	12.5%	
Apgar score at 5 minute					
0-6	0	0.0%	7	87.5%	< 0.01
7 and above	65	100.0%	1	12.5%	
Fetal weight [mean, SD]					0.25
Gestation age (weeks) [mean, SD]					0.78
Number of antenatal visits [mean, SD]					0.39
Parity [mean, SD]					0.86

Table 3: Multivariate logistic regression of type of breech as a predictor for NICU admission

Variable	unadjusted Odds Ratio (95% confidence Interval)	Adjusted Odds Ratio (95% Confidence Interval)	P-Value
Type of breech			
Footling	1	1	
Complete	0.15 (0.05-0.44)	**0.15** (0.05-0.44)	**<0.01**
Extended	0.03 (0.004-0.022)	**0.03** (0.004-0.22)	**<0.01**

Two models are presented: associations of NICU admission and associations with type of breech. NICU admission was associated with lower Apgar score at 1 minute (<7). Babies that were not admitted to NICU had 90% reduced odds for low Apgar score [Adjusted Odds Ratio (OR) = 0.10, 95% Confidence Interval (CI) = 0.004 – 0.24, P-value < 0.01.

Type of breech was associated with lower Apgar score at 5 minutes. Compared to footling breech, patients with extended breech had 97% reduced odds for low Apgar score < 7 (OR = 0.03, CI = 0.004 – 0.22, P-value < 0.01. Patients with complete breech had 85% reduced odds for lower Apgar score < 7 (OR = 0.15, CI = 0.05 – 0.44, P-value < 0.01). Compared to footling breech, patients with extended breech had 97% reduced odds for NICU admission (OR = 0.03, CI = 0.004 – 0.22, P-value < 0.01. Patients with complete breech had 80% reduced odds for NICU admission (OR = 0.20, CI = 0.08 – 0.52, P-value < 0.01). Parity was associated with type of breech. Comparing two women with parity difference of 1, the woman with lower parity had on average 32% reduced odds for extended breech (OR = 0.68, CI = 0.49 – 0.93, P-vale = 0.02).

DISCUSSION

A greater proportion of babies had Apgar score >7 at 1 minute (82.2%) and (90.4%) at 5 minutes. This is higher compared to the lower Apgar score < 7 at 5 minutes in the study conducted in Finland[9] and in Nigeria (OR=8.80, p= 0.004).[12] It is difficult to attribute good Apgar score in this study to availability of expertise and facilities, however, this cannot be ruled out.

The type of breech was associated with a lower Apgar score at 5 minutes and also with NICU admissions. Compared to footling breech, complete breech had 85% reduced odds for lower Apgar (score <7) while extended breech had 97% reduced odds. For NICU admissions, the odds were 80% and 97% reduced in complete and extended breeches respectively. The rate of NICU admission in this study was (9.8%) which is comparable to studies done elsewhere.

Although multiparity did not show direct favorable perinatal outcomes like in the study in Nigeria, it can still be extrapolated in this study as demonstrated by reduced odds for NICU admission for extended breech which was significantly associated with increasing parity. Women of lower parity had on average reduced odds 32% for extended breech (p, 0.02).

In this study, neither fresh still births nor obvious fetal physical injuries were recorded. The perinatal deaths were not determined as infants admitted to NICU were not followed up. The sample size in this study was perhaps too small to suggest competences of the attendants, however the outcomes were good with the mean fetal weight of 3.2kgs.

In this study, bivariate analysis showed that there was some association between Apgar with residence and income (p= 0.01), however, this fell out after multivariate analysis.

The number of attended antenatal visits, number of obstetric scans done and level of operator were not associated with fetal outcomes, however in Nigeria, there was almost double fold increase in perinatal mortality with failure to attend antenatal.[12] Very few patients had scans that there was no evidence for association with fetal outcomes.

The percentage of postpartum haemorrhage was 1/73 (1.4%), and no blood was transfused. There

was no admission to main intensive care unit. Only 1.4% mothers had episiotomy and no major maternal birth injuries were recorded suggesting that episiotomy is not routinely required during breech delivery.

CONCLUSION

Both the fetal and maternal outcomes of the assisted breech deliveries at UTH were favourable. There is still a role for assisted vaginal breech delivery at UTH given that most of breeches are not investigated but end up delivering vaginally due to limited theatre facilities. There is need to continue training practitioners in assisted breech delivery.

LIMITATION

Perinatal mortality after NICU admission could not be determined by the study since NICU follow up was only conducted for a week.

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