THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

FETO-MATERNAL OUTCOMES OF TERM ASSISTED BREECH DELIVERIES AT THE UNIVERSITY TEACHING HOSPITAL, LUSAKA, ZAMBIA

DR JACKSON KASELA

DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN PARTIAL FULLFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICINE IN OBSTETRICS AND GYNAECOLOGY

The University of Zambia

Lusaka

2016

COPYRIGHT DECLARATION

By Dr Jackson Kasela

2016

DECLARATION

I, **JACKSON KASELA**, HEREBY DECLARE THAT THIS DISSERTATION HEREIN PRESENTED FOR THE DEGREE OF **MASTER OF MEDICINE IN OBSTETRICS AND GYNAECOLOGY** HAS NOT BEEN PREVIOUSLY SUBMITTED EITHER IN WHOLE OR IN PART FOR ANY OTHER DEGREE AT THIS OR ANY OTHER UNIVERSITY, NOR BEING CURRENTLY SUBMITTED FOR ANY OTHER DEGREE.

SIGNED

_____

JACKSON KASELA

APPROVED

BY_____

PROFESSOR BELLINGTON VWALIKA (SUPERVISOR)

STATEMENT

I HEREBY STATE THAT THIS DISSERTATION IS ENTIRELY THE RESULT OF MY OWN PERSONAL EFFORT. THE VARIOUS SOURCES TO WHICH I AM INDEBTED HAVE BEEN CLEARLY INDICATED IN THE BIBLIOGRAPHY AND ACKNOWLEDGEMNT.

SIGNED

_____

JACKSON KASELA

CERTIFICATE OF APPROVAL

THE DISSERTATION OF **JACKSON KASELA** IS APPROVED AS FULFILLING PART OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF **MASTER OF MEDICINE IN OBSTETRICS AND GYNAECOLOGY** BY THE UNIVERSITY OF ZAMBIA.

EXAMINER'S SIGNATURE	DATE
_____	_____
_____	_____
_____	_____

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 model as 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 Apgar score was 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 NICU. For the maternal outcomes, one participant has 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 good with low levels of asphyxia (measured by Apgar score), neonatal admissions to NICU, and need for blood transfusion. Breech vaginal delivery at term is still a viable option at UTH as demonstrated by this study.

DEDICATION

This work is dedicated to my wife, Chishimba Kasela, and my three children – Mwiza, Joshua and Wankumbu. This dissertation is also dedicated to my late mum Mrs. Rhoda Nachilima, May her soul rest in eternal peace.

ACKNOWLEDGEMENTS

I would like to thank the Zambia Army for according me study leave and financial support to enable me pursue the study of Master of Medicine in Obstetrics and Gynaecology. I am grateful to the management and Staff of the University Teaching Hospital for permitting me to conduct this study in the Department of Obstetrics and Gynaecology. I am also thankful to the University of Zambia, School of Medicine for according me the opportunity to study at postgraduate level.

I offer sincere gratitude to my supervisor, Professor B. Vwalika for his tireless efforts in offering guidance and encouragement throughout my studies. I am also deeply indebted to Dr. Y Ahmed for his continued mentoring of the study and write up of the dissertation. I am thankful to all the administrative and nursing staff at the University Teaching Hospital, Department of Obstetrics and Gynaecology for helping hands especially during the recruitment and data collection stages of my research project. I am grateful to Dr. S. Munsaka and Mr. M. Kalima for their assistance in data analysis, interpretation and constructive critiquing of my dissertation.

Finally, I would like to thank my lovely wife, Chishimba Kasela, for her love, encouragement, support and understanding.

TABLE OF CONTENTS

List of Tables

ABBREVIATIONS

ACOG	American College of Obstetricians and Gynaecologists
C/S	Caesarean Section
ECV	External Cephalic Version
RCOG	Royal College of Obstetricians and Gynaecologists
PCD	Planned Caesarean Delivery
PPH	Post-Partum Hemorrhage
PVD	Planned Vaginal Delivery
SOGC	Society of Obstetricians and Gynaecologists of Canada
UTH	University Teaching Hospital
WHO	World Health Organisation

1.0 INTRODUCTION

1.1 Background

Breech presentation at term is fairly common at the University Teaching Hospital (UTH), Lusaka, with an assisted delivery conducted every call day. From the 2012 labor ward register the incidence of breech presentation was 3% which conforms to internationally reported figures of 3-4% at term. Most of these cases are actually uninvestigated as they present to labor ward for the first time in labor as clinic referrals, although majority of them end up delivering vaginally. This is in contrast to international recommendations. Since the publication of the Term Breech Trial, there has been a dramatic change worldwide from selective vaginal delivery to planned caesarean section for women with a breech presentation at term (Kaushik and Gudgeon, 2003, Gudgeon, 2003, Rietberg et al., 2005). The Royal College of Obstetricians and Gynaecologists (RCOG 2001) recommended that the best method of delivering a term frank breech or complete breech singleton was by planned caesarean section. American College of Obstetricians and Gynecologists (ACOG) recommended no role for planned vaginal breech delivery at term following the Term Breech Trial (2000). Although revised editions of both guidelines now have some 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. 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.

A randomized study of 208 women in labor with frank breech presentation revealed higher postpartum morbidity rates in women randomized to elective caesarean delivery (Collea et al., 1980) while there was no difference in the rate of neonatal morbidity between the two groups in a randomized study of 105 women with non-frank breech (Gimovsky et al., 1983). The study however noted a higher maternal morbidity rate in the caesarean delivery group. In a comprehensive review of 24 studies encompassing 11,721 women where planned vaginal delivery was compared to planned caesarean delivery, the overall neonatal mortality and morbidity rates resulting from trauma were increased fourfold in the planned vaginal delivery group (Cheng and Hannah, 1993). In a multicenter randomized clinical trial involving 2088 women with term fetuses in

breech at 121 institutions in 26 countries revealed a significantly lower risk of combined perinatal or neonatal mortality or serious neonatal morbidity in the planned caesarean delivery than planned vaginal delivery group and there was also a significantly lower risk of perinatal or neonatal mortality in the planned caesarean than vaginal group (Hofmeyr and Hannah, 2000). The study also reported no significant differences in the maternal mortality or serious morbidity between the two groups (Hofmeyr and Hannah, 2000).

A study conducted in France and Belgium found that vaginal breech delivery appeared to be safe in places where planned vaginal delivery was 'common practice' (Goffinet et al. 2001) and where as another study in Finland showed that vaginal breech delivery was safe where it had been 'traditionally practiced' (Uotila et al., 2005). Albrechtsen et al found that vaginal breech delivery was safe for the majority of infants presenting as breech if appropriate protocols for management and adequate skills and equipment for immediate caesarean section and neonatal resuscitation were available in Norway (Albrechtsen, 2010, Albrechtsen et al., 1998). A retrospective review of outcomes of all pregnancies with breech >37 weeks (Jan 1997 – 2000) involving 641 women noted that significantly fewer nulliparous (37%) than multiparous (63%) achieved vaginal delivery after trial of labor and concluded that safe vaginal delivery at term could be achieved with strict selection criteria, adherence to intrapartum protocol and with an experienced operator (Alarab et al., 2004). In Nigeria, at the University Teaching Hospital, Lagos, a study of outcomes of term singleton breech deliveries revealed that babies delivered by caesarean section had better perinatal outcomes compared with assisted vaginal breech delivery and that maternal morbidity in caesarean group was not significantly different to planned vaginal delivery (PVD) (Egwegbe et al. 2010).

1.2 Statement of the Problem

Breech presentation at term is common at the University Teaching Hospital (UTH) with a vaginal breech delivery conducted almost every call day. The majority of the breeches seen at the institution are actually uninvestigated as they present for the first time in labor mostly as clinic referrals. Most of the breeches admitted to labor ward deliver vaginally. This is in sharp contrast to international standards which recommend caesarean section. Further, these deliveries have not been followed up, and therefore

the fetal and maternal outcomes are not known despite the risks associated with assisted breech delivery. Hence this study which will help fill up this vital missing information.

1.3 Literature Review

1.3.1 Background

Breech presentation, mode of delivery and outcomes is a broadly and well-studied topic. However, the best mode of delivery of a term breech has been over the years one of the most controversial issues in obstetric practice. Several studies have been conducted in different parts of the Globe including retrospective, non-randomized and randomized studies, however, obstetricians up to date do not seem to agree on the best approach to delivering a breech at term. The Term Breech Trial, one of its kind, which was conducted in 121 centers in 26 countries aimed at finding the solution regarding delivery of a term breech once and for all. However, disagreements have continued 14 years after its publication.

1.3.2 Incidence

Globally, the incidence of breech presentation at term is reported to be 3-4% (Cunningham et al, 2005, Edmonds 2007, Dutta 2011). This is similar to RCOG guideline No. 20b (Dec 2006). In Africa, a retrospective study of singleton term breech deliveries in Nnamdi Azikiwe University Teaching Hospital, Nnewi-Nigeria reported an incidence of 2.84% (Igwegbe et al, 2010) while an incidence of 2.6% was reported in another retrospective study at the Imo State University Teaching Hospital, Nigeria (Ojiyi and Dike, 2007). In Yaoundé, Cameroon at Yaoundé General Hospital, a cross-sectional analysis study reported incidence of 2.9% (Ngowa and Kemfang, 2012) while at a district hospital in Durban, South Africa, a retrospective review reported an incidence of 2.4%. (Moodey et al, 2010). The various incidences of singleton breech presentation at term across Africa are within the globally reported figures.

Locally, there is no documentation. However, an estimated 3% incidence was calculated from labor ward 2012 register raw data.

1.3.3 Fetal Outcomes

In a randomized study involving 105 women with non- frank term breech to trial of labor versus elective cesarean section in which 44% of the trial of labor had successful

vaginal delivery, the study revealed no difference in the rate of neonatal morbidity between neonates delivered vaginally and those delivered by caesarean section (Gimovsky et al, 1983). This is similar to the findings of the retrospective study conducted by Kumari between 1997 and 2000 in Abu, Dhabi (Kumari and Grundsell, 2004). The study included 128 women for whom a vaginal delivery was planned versus 122 women who had an elective caesarean section. There was no significant difference between the two groups in terms of fetal outcomes. In another study, involving 8105 women with singleton term breech presentation at 138 French and 36 Belgian Units, 71% of the women planned for vaginal delivery were delivered vaginally. There was no significant difference in the neonatal outcome measures between the caesarean and the vaginal delivery groups.

A study conducted in France concluded that vaginal breech delivery appeared to be safe in places where planned vaginal delivery was 'common practice' (Goffinet et al, 2001). This is similar to the findings of a 7-year cohort study (1995-2002) that included 590 planned vaginal deliveries with a term singleton fetus in breech presentation, 396 elective caesarean sections with a term singleton fetus in breech presentation, and 590 control women intending vaginal delivery with singleton term fetus in cephalic presentation. There were no significant intergroup differences in other outcome measures other than the low Apgar scores in the planned vaginal delivery group. The overall neonatal morbidity rate was small (1.2% vs. 0.5% vs. 0.3%). Of those planned for vaginal delivery 77% had successful vaginal delivery. The study concluded that selective vaginal breech deliveries could be safely undertaken in units having a tradition of vaginal breech deliveries. (Uotila et al, 2002). In a retrospective review of all singleton term breech deliveries between 2002 and 2003 involving 135 women at a county hospital found no statistically significant differences in the outcomes of 5-minute Apgar scores, neonatal intensive care unit admissions, death or fetal complications between the vaginal and caesarean delivery groups (Doyle et al, 2005). However, the mean birthweight was significantly lower in the vaginal delivery group. They concluded that vaginal breech delivery remained a viable option in selected patients. A study by conducted in Norway stated that vaginal delivery was safe for the majority of infants presenting as breech if appropriate protocols for management and adequate skills and equipment for immediate caesarean section and neonatal resuscitation were available (Albrechtsen et al, 1998).

A comprehensive review of 24 studies encompassing 11,721 women compared planned vaginal delivery versus planned caesarean delivery for term singleton fetuses found that all but 2 of the 77 perinatal deaths were in women allowed to deliver vaginally and attributed head entrapment, cerebral injury, intracranial hemorrhage, cord prolapse and intrapartum asphyxia as the main causes of death (Cheng and Hannah, 1993). The same study also noted that the overall neonatal mortality and morbidity rates resulting from trauma were increased fourfold in the planned vaginal delivery group. In a meta-analysis of the outcomes of term breech delivery, trial of labor was associated with increased risk of perinatal injury or/ death (Gifford et al 1995).

A multicenter randomized clinical trial involving 2088 women conducted at 121 institutions in 26 countries where planned vaginal delivery and planned caesarean delivery were compared revealed that perinatal mortality and neonatal mortality or serious morbidity were significantly lower in the planned caesarean delivery (PCD) than PVD group (1.6 vs 0.5%) (Hannah et al 2000). The World Health Organization (WHO) reported that the rate of perinatal or neonatal mortality among the randomized patients was even lower in participating countries reported to have a low perinatal mortality rate (WHO, 2001). The Term Breech Trial (TBT) concluded that PCD was better than PVD and this changed the world`s Obstetric practice with an increase in the rate of C/S as the major opinion-making institutions such as The Royal College of Obstetricians and Gynecologists (RCOG), The American College of Obstetricians and Gynecologists (ACOG) and the Society of Obstetricians and Gynecologists of Canada (SOGC) endorsed the recommendations soon after the publication in 2001. However, since the follow up publication (2004) to the original 2001 TBT which reported that there was no significant difference in the long term outcomes in the babies between the two study groups, RCOG, ACOG and SOGC have modified their recommendations and support VBD if stringent requirements are met.

Regionally, a study done at Nnamdi Azikiwe University Teaching Hospital, Nigeria involving 78 singleton term breech deliveries found that vaginal breech delivery was associated more significantly with low Apgar scores at 5 minutes though there was no significant difference between the two groups in terms of neonatal intensive care unit admission rate and neonatal mortality rate (Igwegbe et al, 2010). A study at another University Teaching Hospital Imo State, Nigeria, revealed that 90.9% of the babies

delivered through elective C/S had good Apgar scores and there was no perinatal death among them and that most of the birth asphyxia and perinatal deaths occurred in babies delivered through emergency C/S or vaginally and most of these were unbooked (Ojiyi and Dike, 2007). In Cameroon at the Yaoundé General Hospital, a study of 249 singleton term breech found that trial of vaginal delivery was associated with significantly increased risk of perinatal death and neonatal morbidity compared to caesarean section. They too found low 5 minute Apgar scores in the vaginal delivery group. (Ngowa and Kemfang, 2012). A retrospective review of 466 singleton breech deliveries at a district level hospital, South Africa, found that women who had antenatal care and had C/S had good outcome measures compared to the emergency C/S group and the group in which no decision was made on the mode of delivery. The highest neonatal complication was in the group that had unplanned vaginal deliveries. (Moodley et al, 2010)

1.3.4 Maternal Outcomes

A randomized study of 208 women in labor with frank breech presentation revealed that women randomized to elective C/S delivery had higher postpartum morbidity rates than vaginal delivery group (49.3% vs. 6.7%) Collea et al 1980). There was also a higher maternal morbidity rate in another randomized study in women delivered by C/S (Gimovsky et al, 1983). This is similar to findings revealed by a study in Nigeria (Igwegbe et al, 2010). However, in the multicenter randomized clinical trial at 121 centers in 26 countries there were no significant differences in the maternal mortality or serious maternal morbidity between the planned C/S and the planned vaginal birth groups (Hannah et al 2000).

In Ireland, a retrospective review of term breech outcomes involving 641 women found that there were significantly fewer nulliparous (37%) than multiparous (63%) who achieved vaginal delivery after trial of labor and there were significantly more infants with weights greater than 3.8kgs who were selected for pre labor C/S delivery (Alarab et al 2004). In Abu Dhabi, a retrospective study revealed that in the planned vaginal group 70% of multiparous and 85% of grand multiparous delivered vaginally compared with 50% of nulliparous women (Kumari et al, 2001). This is similar to the findings of the study in Texas, USA that revealed significantly higher parity in the vaginal group than C/S group (Doyle et al, 2004). The study also noted fewer maternal complications

in the planned vaginal group, contrary to findings by Gimovsky et al and Collea et al who reported higher morbidity rates in the caesarean group.

1.4 Study Justification

This study will determine and document the fetal and maternal outcomes of assisted breech deliveries conducted at UTH. The results will further provide a practical assessment of the institution`s performance and therefore help the institution to reflect on its current policy of management of term breech and draw strategies to improve feto-maternal outcomes. The study will also provide background information for future research.

1.5 Research Question

What are the feto-maternal outcomes of assisted term breech deliveries at UTH, Lusaka?

1.6 General Objective

The main aim of the research was to study the feto-maternal outcomes for term vaginal breech deliveries at the University Teaching Hospital, Lusaka.

1.7 Specific Objectives

i. To determine the common type of breech seen at UTH at term.
ii. To determine the levels of asphyxia of assisted-breech delivered (ABD) babies (using low Apgar score as a proxy)
iii. To determine the percent of admissions to NICU
iv. To determine the average birth weight of ABD babies
v. To determine incidence of post-partum hemorrhage of ABD
vi. To determine the type and incidence of maternal complications following ABD

2.0 RESEARCH METHODOLOGY

2.1 Study design

The study design was cross sectional.

2.2 Study site

The study site was conducted at the labor ward of the University Teaching Hospital, Lusaka, Zambia.

2.3 Study duration

The study was conducted over a period of 1 year.

2.4 Target population

All pregnant women presenting to the labor ward in labor with breech presentation at term were targeted for enrolment.

2.5 Study population and sampling

Pregnant women presenting to the labor ward in labor with breech presentation at term meeting the eligibility criteria were enrolled in the study. Simple random sampling was used to select the study participants.

2.5.1 Inclusion criteria

i. Term breech (37 weeks or more) in labor
ii. Term breech delivered vaginally (postpartum)
iii. Where consent was given

2.5.2 Exclusion criteria

i. Pre-term breech in labor
ii. Twin breech
iii. Term breech with other obstetric indication for C/S (cord prolapse, placenta Previa/abruption, previous uterine scar) who achieve vaginal delivery
iv. Where consent was not given
v. Term breech delivered by C/S

2.5.3 Sample size

The prevalence formula was used to calculate the sample size

$$N=\frac{Z^2pq}{d^2}$$

N is the sample size

Z is the level of statistical certainty chosen or confidence interval at 95% (1.96 and 1.68 at 90%)

D is the degree of accuracy desired which is equal to half the confidence interval

P is the estimated level /prevalence /coverage rate being investigated and q= 1-p

At 4% prevalence, the calculated sample size is 59.

10% was added to account for potential loss of follow up and total sample size was therefore 65.

2.6 Study Variables

Dependent variables	**Independent variables**
Apgar score	Maternal age
Birth weight	Level of education
Feto-maternal injury	Gestational age
Mortality	Parity
Admission to neonatal intensive care unit	Obstetric scan
	Income
	Operator

2.7 Procedure

After delivery, mothers that had delivered a breech delivery at term were informed about the study, and if interested to take part, informed consent was obtained (Appendix I). Information was obtained using an interviewer questionnaire (Appendix II) and complemented by case notes abstraction.

2.8 Data analysis

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.

2.8 Ethical considerations

Before conducting the study, approval was sought from the University of Zambia Biomedical Research Committee (UNZABREC) (see Appendix III). The study was fully explained to the clients before written informed consent was obtained from them and /or relatives, and they were at liberty to withdraw from the study at any time. Participants were not in any way disadvantaged by the study as standard guidelines were applied in their management as much as is feasible. The risk to the participants in the study was minimal as standard management was applied. The main ethical issues surrounding this research was confidentiality. The participants were assured of confidentiality throughout the study and all data collected was treated in the strictest confidence using locked cabinets for paper filled and computer passwords for electronic records.

3.0 RESULTS

3.1 Univariate analysis

A total of 73 patients studied and their characteristics are tabulated in table1. The mean age of the participants was 30.6 ± 5.5 years with ages ranging from 18 to 41 years (median age = 31 years). A greater proportion of the study mothers, 63/73 (86.3%), were not employed, 8/73 (11%) were in formal employment and 2/73 (2.7%) were in informal employment. There were 8/73 (11%) with no education, 26/73 (35.6%) with primary education, 33/73 (45.2%) with secondary education, and 6/73 (8.2%) with tertiary education. Many of the patients, 61/73 (83.6%), thought their income was not adequate, only 12/73 (16.4%) said their income was adequate. About half of the study patients, 36/73 (49.3%), were from high density locations, 31/73 (42.4%) were from medium density locations, and 6/73 (8.2%). Most of the study patients, 69/73 (94.5%), had no history of breech. There were very few mothers with previous low birth weight. Only 3/73 (4.1%) had previous birth weight of < 2.5 Kg. There were 44/73 (60.3%) with previous birth weight 2.5 – 3.4 Kg, 22/73 (30.1%) had 3.5 – 4.0 Kg, and 4/73 (5.5%) had > 4.0 Kg previous birth weight. 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 breach. 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%).

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), and mean gestation age was 38.6 weeks (SD = 1.53). 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). Parity correlated with age ($r=0.67$, $p<0.001$) in the study population. Table 1 shows a summary of the characteristics of the study patients. 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.

Table 1. Characteristics of the study patients

Variable	Frequency	
	n	%
Education level		
None	8	11
Primary	26	35.6
Secondary	33	45.2
Tertiary	6	8.2
Employment		
Formal	8	11
Informal	2	2.7
Unemployed	63	86.3
Adequate income		
Yes	12	16.4
No	61	83.6
Residence		
High density	36	49.3
Medium density	31	42.5
Low density	6	8.2
History of breech		
Yes	4	5.5
No	69	94.5
Previous birth weight		
< 2.5 Kg	3	4.1
2.5 - 3.4 Kg	44	60.3
3.5 - 4.0 Kg	22	30.1
> 4.0 Kg	4	5.5
Breech diagnosed by		
Obstetric ultrasound	5	6.8
Physical examination	55	75.3
Undiagnosed	13	17.8
Type of breech		
Complete	30	41.1
Extended	35	47.9
Footling	8	11
Duration of active second stage		
Less than 15min	19	26
15 - 30 min	39	53.4
30 – 45	15	20.5

Table 1 (Continued). Characteristics of the study patients

Variable	Frequency	
	n	%
Level of operator		
Certified midwife	22	30.1
Registered midwife	19	26
Medical officer	32	43.8
Apgar score at 1 minute		
1-3	3	4.1
4-6	10	13.7
7 and above	60	82.2
Apgar score at 5 minute		
1-3	2	2.7
4-6	5	6.8
7 and above	66	90.4
Apgar score at 10 minute		
1-3	1	1.4
4-6	3	4.1
7 and above	59	80.8
Missing	10	13.7
Fetal weight category		
2.5 - 3.4 Kg	27	37
3.5 - 4.0 Kg	38	52.1
> 4.0 Kg	8	11
Other fetal outcomes		
NICU	7	9.6
Mode of vaginal breech delivery		
Spontaneous	2	2.7
Assisted	71	97.3
Episiotomy done		
Yes	1	1.4
No	72	98.6
Symphysiotomy		
Yes	73	100
No	0	0
Fetal weight [n, mean, SD]	73, 3.2, 0.35	
Age (years) [n, mean, SD)	73, 30.8, 5.4	
Gestation age (weeks) [n, mean, SD]	73, 38.6, 1.53	
Number of antenatal visits [n, mean, SD]	49, 2.6, 1.06	
Parity [n, mean, SD]	73, 3.4, 1.77	

3.2 Bivariate analysis

Study variables are presented in tables 2.1 to 2.4 stratified by one of four variables: Apgar score at 1 minute, Apgar score at 5 minutes, admission to neonatal intensive care, and type of breech. 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.

Table 2.1 shows the bivariate association analysis of the study variables and Apgar score at 1 minute.

Table 2.2 shows the bivariate analysis for association of study variables with Apgar score at 5 minute. There was no study variable that was significantly associated with Apgar score at 5 minutes.

Table 2.3 shows the bivariate analysis for association of study variables with NICU admission. Apgar score at 1 minute and 5 minutes were both significantly associated with NICU admission with P-value < 0.01 apiece. Type of breech was marginally associated with NICU admission, P-value = 0.05.

Table 2.4 shows the Bivariate analysis for association of study variables with type of breech For association of study variables with type of breech (complete or extended), only residence and parity were significantly associated with type of breech, P-value = 0.03 apiece.

Table 2.1 Bivariate analysis for association of study variables with Apgar score at 1 minute

Variable	Apgar Score ≤7		Apgar Score >7		P-value
	n	%	n	%	
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%	
30 – 45	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 2.2. Bivariate analysis for association of study variables with Apgar score at 5 minutes

Variable	Apgar Score >7		Apgar Score ≤7		P-value
	n	%	n	%	
Education level					
None/Primary	31	47.00%	3	42.90%	0.99
Secondary/Tertiary	35	53.00%	4	57.10%	
Employment					
Formal/Informal	57	86.40%	6	85.70%	0.99
Unemployed	9	13.60%	1	14.30%	
Adequate income					
Yes	10	15.20%	2	28.60%	0.32
No	56	84.80%	5	71.40%	
Residence					
High density	32	48.50%	4	57.10%	0.71
Medium/Low density	34	51.50%	3	42.90%	
History of breech					
Yes	4	6.10%	0	0.00%	0.99
No	62	93.90%	7	100.00%	
Breech diagnosed by					
Obstetric ultrasound	5	7.60%	0	0.00%	0.17
Physical examination	51	77.30%	4	57.10%	
Undiagnosed	10	15.20%	3	42.90%	
Type of breech					
Complete	26	39.40%	4	57.10%	0.08
Extended	34	51.50%	1	14.30%	
Footling	6	9.10%	2	28.60%	
Duration of active second stage					
Less than 15min	17	25.80%	2	28.60%	0.21
15 - 30 min	37	56.10%	2	28.60%	
30 – 45	12	18.20%	3	42.90%	
Level of operator					
Certified midwife	19	28.80%	3	42.90%	0.78
Registered midwife	18	27.30%	1	14.30%	
Medical officer	29	43.90%	3	42.90%	
Fetal weight category					
2.5 - 3.4 Kg	26	39.40%	1	14.30%	2.40
3.5 - 4.0 Kg	32	48.50%	6	85.70%	
> 4.0 Kg	8	12.10%	0	0.00%	
NICU					
NO					
Yes					
Fetal weight [mean, SD]	3.2, 0.36		3.2, 0.21		0.68
Gestation age (weeks) [mean, SD]	38.6, 1.54		38.9, 1.57		0.65
Number of antenatal visits [mean, SD]	2.6, 1.08		2.2, 0.84		0.39
Parity [mean, SD]	3.4, 1.7		3.4, 1.51		0.97

Table 2.3. 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 2.4. Bivariate analysis for association of study variables with type of breech

Variable	Complete		Extended		P-value
	n	%	n	%	
Education level					
None/Primary	14	46.7%	15	42.9%	0.81
Secondary/Tertiary	16	53.3%	20	57.1%	
Employment					
Formal/Informal	3	10.0%	5	14.3%	0.72
Unemployed	27	90.0%	30	85.7%	
Adequate income					
Yes	3	10.0%	8	22.9%	0.20
No	27	90.0%	27	77.1%	
Residence					
High density	20	66.7%	14	40.0%	0.03
Medium/Low density	10	33.3%	21	60.0%	
History of breech					
Yes	1	3.3%	3	8.6%	0.62
No	29	96.7%	32	91.4%	
Breech diagnosed by					
Obstetric ultrasound	1	3.3%	2	5.7%	0.46
Physical examination	23	76.7%	30	85.7%	
Undiagnosed	6	20.0%	3	8.6%	
Duration of active second stage					
Less than 15min	10	33.3%	8	22.9%	0.25
15 - 30 min	17	56.7%	18	51.4%	
30 – 45	3	10.0%	9	25.7%	
Level of operator					
Certified midwife	10	33.3%	9	25.7%	0.66
Registered midwife	8	26.7%	8	22.9%	
Medical officer	12	40.0%	18	51.4%	
Fetal weight category					
2.5 - 3.4 Kg	9	30.0%	15	42.9%	0.39
3.5 - 4.0 Kg	18	60.0%	15	42.9%	
> 4.0 Kg	3	10.0%	5	14.3%	
Apgar score at 1 minute					
0-6	6	20.0%	4	11.4%	0.49
7 and above	24	80.0%	31	88.6%	
Apgar score at 5 minute					
0-6	4	13.3%	1	2.9%	0.17
7 and above	26	86.7%	34	97.1%	
Previous birth weight					
< 2.5 Kg	1	3.3%	2	5.7%	0.17
2.5 - 3.4 Kg	17	56.7%	23	65.7%	
3.5 - 4.0 Kg	8	26.7%	10	28.6%	
> 4.0 Kg	4	13.3%	0	0.0%	
Fetal weight [mean, SD]	3.2, 0.32		3.2, 0.39		0.60
Gestation age (weeks) [mean, SD]	38.8, 1.76		38.6, 1.38		0.62
Number of antenatal visits [mean, SD]	2.8, 1.04		2.5, 1.12		0.36
Parity [mean, SD]	4.0, 1.59		3.0, 1.72		0.03

3.3 Multivariate analysis (Logistic regression analysis)

Two models are presented:

1. associations of NICU admission and
2. associations with type of breech

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.

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).

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**

4.0 DISCUSSION

In this study, 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. In a study conducted in Nigeria, assisted breech delivery was associated more significantly with low Apgar (< 7) at 5 minutes (OR=8.80, p= 0.004) (Igwegbe et al, 2010). Similar findings were also demonstrated in a study in Cameroon where vaginal breech delivery had low 5 minute Apgar scores (p= 0.01) (Ngowa et al 2011). It is difficult to attribute good Apgar score in this study to availability of expertise and facilities, however, this cannot be ruled out. The numbers in this study are not big enough to suggest this finding and that is a limitation.

In this study the type of breech was, however, 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 8.21% in Nigeria (Ojiyi and Dike, 2007) and 13.63% in Cameroon (Ngowa et al 2011). In a study conducted in South Africa, 21% babies had Apgar score < 7 at 5 minutes and 2.2% had significant injuries and 52.2% required NICU admission (Uzabakiriho and Buchmann 2012). This study, however, had some participants who were pre term and hence outcomes cannot be compared.

Although multiparity did not show direct favorable perinatal outcomes like in the study in Nigeria, it can still be extrapolated in this study. The study demonstrated 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, there were no fresh still births and no any obvious fetal physical injuries were recorded. The perinatal deaths were however not determined as infants admitted to NICU were not followed up, except that 2/7(28.6%) of the admissions were discharged after 2 hours of observation. Also, none of the participants had an intra uterine death. In the term breech trial, perinatal deaths were 1.3% (p= 0.01), however, some participants were thought to have been wrongly recruited. A study in Nigeria recorded 12.3% FSBs (Igwegbe et al, 2010). 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 (Egwegbe et al. 2010). 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 there was no blood transfusion given after breech delivery and there was no admission to main intensive care unit suggesting the maternal outcomes in this study were good. Only 1.4% mothers had episiotomy and there were no major maternal birth injuries recorded suggesting that episiotomy is not routinely required during breech delivery.

5.0 CONCLUSION

The feto-maternal outcomes of the assisted breech deliveries at UTH are good. Techniques of vaginal breech delivery still remain important skills for obstetric clinicians. There is still a role for assisted vaginal delivery at UTH given that most of breeches are not investigated and end up being delivered vaginally due to limited theatre facilities. There is need to continue training practitioners in assisted breech delivery. To conclude Feto-maternal outcomes of assisted term vaginal breech deliveries at UTH were good with extremely low levels of asphyxia (measured by Apgar score), neonatal admissions to NICU, and need for blood transfusion. Breech vaginal delivery at term is still a viable option as demonstrated by this study

6.0 STUDY LIMITATIONS

The study would have been more complete if admissions to NICU were followed up for even a week, then perinatal deaths following assisted breech delivery at UTH would have been known.

7.0 RECOMMENDATIONS

There is need to continue training practitioners in assisted breech deliveries. Clinical skills to identify breech should be taught especially to staff in admission wards (17.8% in this study were missed on admission). External cephalic version especially in labor should be encouraged if conditions are met. The future direction would be to investigate the feto-maternal outcomes following successful external cephalic version.

REFERENCES

Alarab, M., Regan, C., O'connell, M. P., Keane, D. P., O'herlihy, C. & Foley, M. E. 2004. Singleton vaginal breech delivery at term: still a safe option. *Obstet Gynecol,* 103**,** 407-12.

Albrechtsen, S. 2010, Vaginal delivery in breech presentation, *Tidsskr Nor Laegeforen,* 130**,** 589.

Albrechtsen, S., Rasmussen, S., Dalaker, K. & Irgens, L. M. 1998. Factors influencing delivery method in breech presentation. *Acta Obstet Gynecol Scand,* 77**,** 416-21.

American College of Obstetricians and Gynecologists (ACOG Committee Opinion No. 340. Mode of Term Singleton Breech Delivery. Obstet Gynecol 2006; 108:235-7
Cheng, M. & Hannah, M. 1993. Breech delivery at term: a critical review of the literature. *Obstet Gynecol,* 82**,** 605-18.

Collea, J. V., Chein, C. & Quilligan, E. J. 1980. The randomized management of term frank breech presentation: a study of 208 cases. *Am J Obstet Gynecol,* 137**,** 235-44.

Doyle, N. M., Riggs, J. W., Ramin, S. M., Sosa, M. A. & Gilstrap, L. C., 3rd 2005. Outcomes of term vaginal breech delivery. *Am J Perinatol,* 22**,** 325-8.

Dutta,D.C. (2011) *Text Book of Obstetrics* 7th Edition, London: New Central Book Agency.

Egwegbo, A.O, Monago E.N, and Ugboaja, J.O (2010) Vaginal Delivery for Breech Presentation: A comperative Analysis. Afri. J Biomed. Res. 13 (Jan 2010) 15-18

Gimovsky, M. L., Wallace, R. L., Schifrin, B. S. & Paul, R. H. 1983. Randomized management of the nonfrank breech presentation at term: a preliminary report. *Am J Obstet Gynecol,* 146**,** 34-40.

Goffinet, F., Blondel, B. & Breart, G. 2001. [Breach presentation: questions raised by the controlled trial by Hannah et al. on systematic use of cesarean section for breach presentations]. *J Gynecol Obstet Biol Reprod (Paris),* 30**,** 187-90.

Gudgeon, C. W. 2003. 'Sydney summer sign'. *Aust N Z J Obstet Gynaecol,* 43**,** 174.

Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willlan AR. Planned caesarean section vs vaginal birth for breech presentation at term: a randomised multicenter trial. Term breech trial collaraboration Group Lancet 2000; 356(9239):1375 83

Hofmeyr, G. J. & Hannah, M. E. 2000. Planned caesarean section for term breech delivery. *Cochrane Database Syst Rev***,** CD000166.

Kaushik, V. & Gudgeon, C. 2003. Caesarean for breech: a paradigm shift? *Aust N Z J Obstet Gynaecol,* 43**,** 298-301; discussion 261.

Kumari, A. S. & Grundsell, H. 2004. Mode of delivery for breech presentation in grandmultiparous women. *Int J Gynaecol Obstet,* 85**,** 234-9.

Ngowa, J.D, Kemfang ,Kasia, J.M, Ekotarh, A, Nzedjom, C (2012) Neonatal Outcome of Term Breech Births: A 15 year Review Younde General Hospital,Cameroon. Acadermic journal, clinics in mother and child health; 2012, vol.9 issue 1, special selection p1

Ojiyi,E, Dike I.E, (2007) Perinatal Outcome in Singleton Term *Breech Delivaries*,Imo state, Imo State, Nigeria. [on line] Available: http/www.webmedcentral.com/article view/2543 (Accessed 24/06/15)

Rietberg, C. C., Elferink-Stinkens, P. M. & Visser, G. H. 2005. The effect of the Term Breech Trial on medical intervention behaviour and neonatal outcome in The Netherlands: an analysis of 35,453 term breech infants. *BJOG,* 112**,** 205-9.

Royal College of Obstetricians and Gynaecologists. The management of Breech Presentation. Guideline number 20b. London: RCOG; revised 2006

Society of Obstetric and Gynecologist of Canada (SOGC) Public Statement of Vaginal Breech (Press release) SOGC News 20.

Uotila, J., Tuimala, R. & Kirkinen, P. 2005. Good perinatal outcome in selective vaginal breech delivery at term. *Acta Obstet Gynecol Scand,* 84**,** 578-83.

Uzabakiriho, B. and Buchmann, E.J., 2012. Vaginal breech births in a hospital where caesarean section is preferred for breech presentation. South African Journal of Obstetrics and Gynaecology, 18(3).

APPENDICES

Appendix I. Participant information sheet and consent form

Information sheet

TITLE: Feto-maternal outcomes of term vaginal breech deliveries at UTH, Lusaka.

My name is Dr. Jackson Kasela a postgraduate student at the University of Zambia, School of Medicine. I am conducting a research on the above subject at UTH in the Department of Obstetrics and Gynaecology as part of the requirement for the award of a master degree in Medicine. I am here by inviting you to take part in the study.

Purpose

Following this study, I would like to find out the outcomes of breech fetuses delivered vaginally, possible factors associated with breech presentation and also how common breech presentation is at UTH. I would also like to find out maternal outcomes of vaginal breech deliveries. The information collected I this study will help to improve management of term breech cases at the Institution. The data will also be used as a base for future research works on breech.

Explanation of the procedure

You have been invited to participate in this study because your baby is presenting with a breech. If you agree to take part, you will be asked a few questions to help us know you better while some information will be extracted from your file.

Benefits and Risks

There are no direct benefits to the participants by virtue of participation as standard care of management will be applied as per hospital protocol. The participants will not be subjected to any form of risks by participating in the study. Obstetric ultrasound will be done on labor ward to confirm breech and type whenever possible. The findings of the study will help to improve management of term breech pregnancies at the institution.

If you agree to take part, please sign the consent form so you can be enrolled in this study. If you have any question, kindly contact addresses below:

Principal Researcher Dr. J. Kasela Cell# 0977-236818/0965-236818 University Teaching Hospital Dept. of Obstetrics and Gynaecology Lusaka	Supervisor Dr. B. Vwalika Cell # 0966782971 Head, Dept. of Obstetrics and Gynaecology University Teaching Hospital Lusaka.

Participant consent form

TITLE: Feto-maternal outcomes of term vaginal breech deliveries at UTH, Lusaka.

I wish to inform you that there is no direct benefit by virtue of taking part in this study. There is also no risk exposure in participating in this study as standard care of management will be offered. Information gathered will help to improve care of term breech at UTH.

I have read and understood all the information concerning Breech Presentation at term and what this study is all about. I therefore voluntarily consent to take part in this study.

Name;

……

Signature; ……Date; ……

Right Thumb print; ……...…… Date; ……

Witness/parent/Guardian

Name;

……

Signature; …….……. Date; ……..……

Right Thumb Print; ……...Date; …….

Name of Person taking consent; ……..…

Signature; ……...……Date; ……

Appendix II: Questionnaire

TITLE; Outcomes of Term vaginal breech deliveries at UTH

Initials; ……..Age; ……..…File; ……..……

Socio-demographic data

Level of education

1. 0. None ( )
2. 1. Primary ( )
3. 2. Secondary ( )
4. 3. Tertiary ( )

Religion

1. 0. Christian ( )
2. 1. Muslim ( )
3. 2. Hindu ( )
4. Other …….

Are you employed?

1. Formal ( )
2. Informal ( )
3. Unemployed ( )

Is your income adequate?

1. 0. Yes ( )
2. 1. No ( )

Area of residence

1. 0. High density ( )
2. 1. Medium density ( )
3. 2. Low density ( )

Antenatal

Booking date…….…….…….

Number of antenatal visits…….…….

Number of obstetric scans done……..……

Gestational age…….**Parity**…….

Previous history of breech delivery……

1. Yes ( )
2. No ( )

Previous birth weights……

1. < 2.5 kgs ( )
2. 2.5 kgs – 3.4 kgs ( )
3. 3.5 kgs – 4.0kgs ( )
4. > 4.0 kgs ( )

Breech diagnosed by……

1. Obstetric ultrasound
2. Physical examination
3. Undiagnosed (seen on delivery)

Other findings on ultrasound, (indicate below)

……

……

Type of breech….

1. Complete ( )
2. Extended ( )
3. Footling ( )

ECV attempted…..

1. Yes……
2. NO……

If yes, what was the outcome…..

1. Successful
2. Unsuccessful

Intrapartum

Duration of active second stage……..

1. Less than 15 minutes
2. 15 -30 minutes
3. 30 -45 minutes
4. More than 45 minutes

Level of operator

1. Certified midwife
2. Registered midwife
3. Medical officer….
    a) Interns
    b) Registrar
    c) Senior registrar
    d) Consultant

Fetal outcomes

1. Apgar score…….

    At 1 minute

    1. 1-3
    2. 4-6
    3. 7 and above

    At 5 minute

    1. 1-3
    2. 4-6
    3. 7 and above

    At 10 minute

    1. 1-3
    2. 4-6
    3. 7 and above

2. Fetal weight…….
    1. Less than 2.5Kg
    2. 2.6-2.9Kg
    3. 3.0-3.4kg
    4. More than 3.5Kg

3. Other Fetal outcomes
    1. FSB……
    2. To NICU…….
    3. Fetal injuries (indicate)……

Mode of vaginal breech delivery

1. Spontaneous ( )
2. Assisted ( )
3. Extraction ( )
4. Instrumental ( )

Indicate any challenges met in conducting delivery

……

……..

Maternal

1. Intervention
    1. ECV ( )
    2. Yes ( )
    3. No ( )

2. Episiotomy done…
    1. Yes ( )
    2. No ( )

3. Symphysiotomy …
    3. Yes ( )
    4. No ( )

Outcomes

Genital injuries…uterine/cervical/vaginal/perineal

1. PPH
2. Blood Transfusion
3. ICU admission
4. Maternal Death

Appendix III: Ethics approval

THE UNIVERSITY OF ZAMBIA

BIOMEDICAL RESEARCH ETHICS COMMITTEE

Telephone: 260-1-256067
Telegrams: UNZA, LUSAKA
Telex: UNZALU ZA 44370
Fax: + 260-1-250753
E-mail: unzarec@unza.zm

Ridgeway Campus
P.O. Box 50110
Lusaka, Zambia

Assurance No. FWA00000338
IRB00001131 of IORG0000774

19th January, 2016.

Our Ref: 004-05-15.

Dr. Jackson Kasela,
University of Zambia,
School of Medicine,
Department of Obstetrics and Gynaecology,
P.O Box 50110,
Lusaka.

Dear Dr. Kasela.

RE: RESUBMITTED RESEARCH PROPOSAL: "FETO-MATERNAL OUTCOMES OF TERM ASSISTED BREECH DELIVERIES AT UTH, LUSAKA ZAMBIA" (REF. No. 004-05-15)

The above-mentioned research proposal was presented to the Biomedical Research Ethics Committee on 15th January, 2016. The proposal is approved.

CONDITIONS:

- This approval is based strictly on your submitted proposal. Should there be need for you to modify or change the study design or methodology, you will need to seek clearance from the Research Ethics Committee.
- If you have need for further clarification please consult this office. Please note that it is mandatory that you submit a detailed progress report of your study to this Committee every six months and a final copy of your report at the end of the study.
- Any serious adverse events must be reported at once to this Committee.
- Please note that when your approval expires you may need to request for renewal. The request should be accompanied by a Progress Report (Progress Report Forms can be obtained from the Secretariat).
- **Ensure that a final copy of the results is submitted to this Committee.**

Yours sincerely,

M.C Maimbolwa PhD
CHAIRPERSON

Date of approval: 19th January, 2016. **Date of expiry:** 18th January, 2017.