OBSTETRIC OUTCOME AMONG WOMEN WITH ONE PREVIOUS CAESAREAN SECTION AT MUHIMBILI NATIONAL HOSPITAL, DAR ES SALAAM, TANZANIA

By

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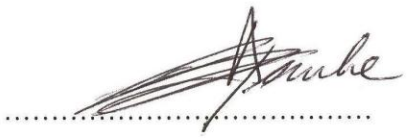
CERTIFICATION

The undersigned certifies that he has read and hereby recommend for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitle **"Obstetric outcome among women with one previous caesarean section at Muhimbili National Hospital, Dar-es-salaam, Tanzania"**in partial fulfilment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology.



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DR A. B. PEMBE

(SUPERVISOR)

DECLARATION AND COPYRIGHT

I, Dr Mashavu Khalid Othman, hereby declare that this dissertation is my own original work, and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature.....

Date.....23.11.2007.....

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Praise and Honours to Allah who enabled this work to be successful.

DEDICATION

This dissertation is dedicated to my parents Khalid and Fatma, my late brother Said, my husband Dr Mohammed and my children Faiza, Abdulkarim and Luqman.

ABSTRACT

Objective: To determine obstetric outcome among women with one previous caesarean section (CS).

Methodology: A hospital based cross sectional descriptive study was conducted from13th September 2006 to 2nd February 2007 at Muhimbili National Hospital, Dar-es-salaam, Tanzania. All women with one previous CS coming for delivery were identified on admission. Data on demographic, obstetric, social and medical history, the outcome of the index pregnancy and the indication for the previous CS were collected. The maternal and perinatal outcomes of patient who underwent trial of scar (TOS), elective repeat CS (ERCS) and emergence repeat CS (EmRCS) were analysed.

Main results: There were 3,285 deliveries conducted during the study period of which 365 (11.1%) had one previous CS. TOS was done in 80 (22.3%) women of which 41(51.2%) had successful TOS. Dystocia accounted for 63% of the failed TOS and was the main indication for repeat CS (43.5%). It also contributed to 62.6% of the indication for the first CS. There was no much difference in foetal outcome between women underwent TOS and those repeat CS was done. ERCS resulted in better APGAR score than ERCS. There were seven ruptured uterus all in EmRCS. The mean decision time for failed TOS to delivery was 3 hours and the mean duration of labour was 9 hours.

Conclusion: The proportion of women undergoing TOS is small. The success rate in TOS is more than 50%. There was no much difference in morbidity between women underwent TOS and those repeat CS was done. Doctors should be encouraged to offer TOS to pregnant women with one previous caesarean section.

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Abbreviations:

ACOG	American College of Obstetricians and Gynaecologists
CS	Caesarean Section
EBL	Estimated Blood Loss
EmOC	Emergency Obstetric Care
KCMC	Kilimanjaro Christian Medical Centre
MNH	Muhimbili National Hospital
MMC	Muhimbili Medical Centre
STAH	Subtotal Abdominal Hysterectomy
TOS	Trial of Scar
VBAC	Vaginal Birth after Caesarean Section

1.0 INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION

Caesarean section (CS) is defined as delivery of the foetus through an incision made both in the abdominal wall and uterine wall, usually used as an alternative when delivery through the vagina is considered more risky [1,2].

There are mainly two types of CS. The lower segment CS where the incision is made on the lower segment and the upper segment CS where the incision is made on the upper segment of uterus. The later is also known as classical CS. Lower segment CS is the most common and where a transverse incision is made is known as Kerr technique. The incision has the advantage as it causes less blood loss, is easier to repair, does not promote adherence of bowel or omentum to the incision line and is least likely to rupture during subsequent pregnancy. The rate of dehiscence or rupture during subsequent pregnancy is less than 1.2% [1].

The disadvantages of the low transverse incision are primarily restricted to situations in which the lower uterine segment is underdeveloped. In this circumstance there is a greater chance of lateral extension into major uterine vessels resulting in severe haemorrhage. To avoid such situation a 'J' or 'U' or an inverted 'T' Lower segment uterine incision extending to upper segment or the upper segment transverse incision will be required, creating a scar more prone to uterine rupture [3].

The low vertical incision, also a lower segment incision may be used in situations where the transverse incision is inappropriate, predominantly in patients with underdeveloped lower uterine segment. If the vertical incision is confined to the lower uterine segment there is a lower probability of dehiscence and / or rupture in subsequent pregnancy and such patients may be eligible for a subsequent trial of vaginal delivery. From the study done at Mississipi, it has been found that the likelihood of successful outcome and the incidence of complications are comparable to those of lower transverse incision [4].

The upper segment incision of the uterus at the fundus is commonly used when the lower segment can not be exposed or entered safely [1]. This incision is more complicated and time consuming to repair. The incidence of infection and adhesion is high and has greater risk of incision rupture during subsequent pregnancies even before the onset of labour [5]. This is the reason why in some countries including Tanzania bilateral tubal ligation (BTL) is advised after upper segment incision.

CS is associated with multiple intra and post operative complications compared to vaginal delivery. The intra operative complications include uterine lacerations, bladder, urethral and bowel injuries, and haemorrhage. Post operative complications are endomyometritis, wound infection, urinary tract infection, thromboembolic complications, impaired bowel functions and pelvic thrombophlebitis [1, 2, 6].

The rate of CS has increased dramatically world wide over the past three decades [1, 6, 7, 8]. The rate varies considerably in different countries and in different regions within the same country. By 2004 it was 29% in the United States, [8] 20% in United Kingdom, [9] 21%

in Canada [10] and 29.9% in China [11]. Brazil has a CS rate more than 36% with the maximum rate reported in private hospitals [12, 13].

In Tanzania data from two large hospitals Kilimanjaro Christian Medical Centre (KCMC) and Muhimbili National Hospital (MNH) show a steady increase in rate of CS. The rate of CS at KCMC has increased from 22% in 1996 to 25% in 1999 while at MNH it has increased from 15.7% in 1999 to 31.6% in 2004 [14, 15]. The possible reasons for CS increase are increased availability of medical technology, such as foetal monitoring machines, patients' demand for CS, delivery of breech by CS, fear of litigation and repeat of CS. Different studies have shown association between CS rates and influence of maternal conditions, women's socio economic status, specific aspects of the admitting institution and the attending physician's personel preferences [7, 16, 17].

In the first half of 20 century, CS implied that all subsequent pregnancies were likely to be delivered the same way. The fear behind the idea was rupture of caesarean scar. The notion "Once CS always CS" was found on original procedure of upper segment CS. In 1940 lower segment CS replaced the classical one. However despite the evidence of safety of Vaginal Birth after CS (VBAC) in selected cases, fear of catastrophic uterine scar rupture has persisted. Several studies have shown that 60-80% of women with one previous lower segment CS can achieve a vaginal delivery when trial of the scar (TOS) is done [18, 19, 20, 21, 22, 23, 24].

There are several absolute contraindications for TOS, including T-shaped uterine

incision, prior uterine rupture and operative complication at the time of the first abdominal delivery; for instance extensive cervical laceration and tears. Other absolute contraindications are previous uterine surgery with entrance into the uterine cavity like during extensive myomectomy, contracted pelvis and any medical or obstetric complication that precludes vaginal delivery [5].

The use of uterotonic agents; intravenous oxytocin and prostaglandin in obstetrics is still controversial. Some studies done on augmentation of labour with oxytocin showed no increase in risk of uterine rupture, maternal or perinatal morbidity and mortality [25] while others have shown increase in the rate of uterine rupture and surgical intervention [18]. The use of prostaglandin in ripening the cervix in previous CS has not yet been dealt with in a series large enough to address concerns of safety. Some of the small series published to date suggest that, there is no increased risk of uterine rupture when prostaglandins are used appropriately while other studies have reported increased risk [26, 27, 28].

1.2 LITERATURE REVIEW

There are no randomized trials to prove that maternal and neonatal outcomes are better with VBAC than with repeat CS. Different studies have shown that the benefits of VBAC outweigh the risks in most women with a prior low transverse caesarean delivery [29].

Although there is a strong consensus that TOS is appropriate for most women who have had a previous low-transverse caesarean delivery, increased experience with VBAC indicates some potential problem [29]. The adverse maternal or perinatal outcomes are rare [18, 20], thus studies with large population are necessary. A recently meta-analysis study in USA examining the maternal and neonatal morbidities associated with TOS and ERCS shows that TOS is associated with 0.4 % uterine rupture. No maternal death or severe foetal complications are observed [20].

The proportion of women with one previous CS who undergo TOS is decreasing due to fear of complications and pressure on doctors and patients of getting good scored baby. In some parts of the world the proportion is reduced not because of fear of complications but fear on litigation. An obstetrician will almost never be blamed for doing the operation, while he/she may be sued for not having done it [30]. Some women due to their negative attitude on vaginal delivery or their previous bad obstetric experiences are not willing to undergo the TOS therefore they select to deliver by repeat CS.

In order to reduce CS rate special efforts are needed. There should be a proper use of oxytocin, doctors should develop behaviour of seeking second opinion on decision making when there are some doubts, primigravidae should be tried for labour and last but not least efforts have to be made to get women deliver vaginally after a primary CS.

There are subsets of women who are not candidates for TOS and those who are eligible for it but in whom the chances of success are low and the final subset that have a high chance of achieving a vaginal delivery. It is appropriate to offer TOS to any woman with a previous uncomplicated lower uterine segment CS and no other adverse obstetric features [18, 31].

According to Patterson TOS often proves to be safe and successful in a carefully selected population of women.[32] The study done by Kihwele in 1983 of 208 women underwent TOS 70.7% delivered vaginally, the remaining 29.3% had repeat CS in labour due to poor progress of labour, foetal distress, CPD discovered in labour and scar tenderness [19]. Although most studies have shown high success rate (60-80) in TOS [20, 21, 22, 24] but a recent study at KCMC only 29.3% women had successful TOS [14].

The success rate of TOS is influenced by different factors, among the important factors is the indication of the primary CS. Butt et al did a study in Peshawar and found that the outcome of TOS was poor when previous caesarean section was for dystocia which is known as recurrent cause while statistically significant successful TOS was observed in women who had previous CS due to non recurrent cause like malpresentation, antepartum haemorrhage and foetal distress. Spontaneous onset of labour, cervical dilatation 3-5cm

and foetal weight less than 4 kg favoured vaginal delivery. While foetal weight more than 4 kg, gestation age 40 weeks and above, mal-position and incoordinate uterine action were linked with unfavourable outcome. Vaginal delivery whether before or after CS showed high success rate of TOS [18, 21].

Uterine rupture is the most well known and feared complication of TOS which may result into the foetal death, heavy bleeding which can endanger the lives of both mother and the baby. Uterine rupture can also occur in women who are not in labour but the rate of rupture increases with the onset of labour. The overall rate of uterine rupture in a TOS is 0.6% among women with spontaneous onset of labour and 0.16% in women planned for ERCS without labour [21, 28, 33]. From these findings it can be concluded that the rate of uterine rupture in TOS group is higher than in ERCS but the overall rate of uterine rupture is less than 2%.

In a four year prospective observational study at 19 academic medical centers maternal and foetal outcome between women in TOS and ERCS were compared. Among 17,898 women in TOS and 15,801 in ERCS symptomatic uterine rupture occurred in 0.7% in TOS group. The rate of blood transfusion was 1.7% and 1.0% respectively. However the frequency of peripartum hysterectomy and maternal death was not much different between the two groups [2]. Another study reports that women on TOS are less likely to get blood transfusion and hysterectomy than women in the ERCS group [33].

Foetal outcoms e are slightly different between the two groups. Studies have shown that babies with 5-minute APGAR score of ≥ 7 are more in ERCS compared to TOS [14, 21]. In a

case control study done at KCMC, the rate of perinatal complications in the study group was slightly higher with repeated CS group however the difference was not statistically significant [14].

2.0 STATEMENT OF THE PROBLEM

The rising incidence of caesarean section deliveries in developing countries and elsewhere is a concern in terms of associated morbidity and increase in the cost to health services. The rate of CS at MNH has increased from 15.7% in 1999 to 31.6% in 2004 [15]. There is still high maternal mortality ratio and perinatal mortality despite the gross increase in CS rate [34]. Previous studies at MNH reported repeat CS being the second most common cause of CS [19, 35].

TOS in careful selected candidates is accepted as a practical and safe means of decreasing CS rate. When successful, TOS has maternal benefits including reduced duration of hospitalization and there fore reduction in hospital expenditure.

3.0 RATIONALE OF THE STUDY

Management of delivery of women with one previous CS is still a subject of debate.

There is no recent study done at MNH to assess the outcome of labour in patients with one previous CS. Previous study was done more than twenty years ago. In such long period things might have changed. This study is designed to find delivery management of women with one previous CS and their associated maternal and foetal outcomes. The results will provide important information on improving the care of these women and possibly reduction of CS rate as well as designing guidelines for management of patients with one previous scar.

4.0 OBJECTIVES

4.1 Broad objective

To determine obstetric outcome among women with one previous caesarean section at MNH.

4.2 Specific objectives

1. To determine proportion of women undergoing TOS among those with one previous CS scar.
2. To determine proportion of women delivering vaginally among those on TOS.
3. To compare maternal and neonatal outcome between women delivered by elective repeat CS and emergency repeat CS and those who got vaginal birth after CS.

5.0 METHODOLOGY

5.1 Study design

A hospital based cross sectional descriptive study.

5.2 Study area

The study was conducted at MNH in the general labour ward, obstetric ICU, fast track labour ward and antenatal wards. MNH is the tertiary and university teaching hospital located in Dar-es-salaam, Tanzania with population of about 3 million according to 2002 census [36]. The hospital receives several referrals from three main district hospitals of Dar-es-salaam (Amana, Temeke and Mwananyamala hospital). Some women come from health centers, private hospitals and district hospitals surrounding Dar-es-salaam. Most patient come directly from home among them are those with high risk factors who are attending antenatal care at MNH.

Maternity building consists of 7 wards. Four wards each with 38 beds capacity are used to admit antenatal and postnatal mothers. Other wards are labour ward, postnatal ward for observation of those who deliver normally before they are discharged home. The remaining ward is used as an obstetric ICU for the patients with eclampsia and mothers in critical condition.

There is neonatal special care unit which provides neonatal care for premature and sick neonates born at MNH and all babies with problems referred from other hospitals. Babies born by CS are directly admitted in the neonatal ward for at least one day or till their

mothers become ambulant. Those babies from fast track stay with their mothers soon after recovery from anaesthesia if they don't have problems.

Maternal care services are provided in two different categories at MNH. The normal track, where by free services are provided according to the government policy and the fast track in which patients pay for services provided.

A team of a consultant and a specialist with a resident/ registrar and one intern are on duty daily in the labour ward. They conduct major ward round in the morning with nurse officers and nurse midwives.

Women planned for elective repeated CS are admitted to their relevant obstetric wards from the antenatal clinic and sent to theatre directly for the operation. If labour starts before the scheduled date the decision on delivery is reached by a team on duty.

Routinely on admission in labour ward, all patients are initially seen by a nurse midwife. Some important informations are filled out in the partograph including the vital signs, maternal and foetal condition together with present and previous obstetric history. The initial examination including vaginal examination is done by one of the doctors. The decision for TOS or repeat emergence CS is commonly done by a doctor more senior than an intern doctor.

At MNH TOS is planned during ANC visits in women who are eligible for TOS in vertex

presentation. It is started when a woman has spontaneous onset of labour with cervical dilatation of three cm or more. Augumentation of labour is done by only artificial rupture of membrane when necessary depending on the HIV sero-status of the woman. Oxytocin or prostaglandins are not used for induction or augumentation of labour.

Vaginal examination is done 3 hourly, more frequently than the routine four hourly done in other cases. Women on trial of scar are prepared in case the need for emergency CS happens during labour process. Blood grouping and cross match is done and IV line is set to keep the vein patent. The vital signs and foetal heart rate are checked half hourly in early active phase of labour and every 15 minutes in late active and second stage of labour. Observation on cervical dilatation, vaginal bleeding, scar tenderness and liquor colour is done. If the partograph shows any deviation to the right from the alert line, presence of signs of impending rupture (scar tenderness, unexplained maternal high pulse rate, unexplained fresh PV bleeding) and evidence of foetal distress (presence of fresh thick meconeum stained liquor, irregular foetal heart beats, heart beats <120 or >160), the TOS is said to have failed and the decision for emergency CS is made.

5.3 Study population

All women attending delivery services at MNH.

5.4 Study sample

All women with one previous CS delivered at MNH during the study period.

5.5 Sample size

Was calculated using the formula:

$$N = \frac{Z^2 \times P\,[1-P]}{D^2}$$

Where;

N = Minimum sample size required

Z = 1.96 (By using 95% confidence interval)

P = Proportion of women delivering vaginally among those with previous one CS scar taken as 70.7% (Kihwele 1983)

D = Maximum error allowed = 0.05

Thus $N = \frac{1.96^2 \times 0.707 \times 0.293}{0.05^2}$

This gave a minimum sample size of 318 women with one previous CS.

5.6.Study duration

The study was conducted for five month

5.7 Sampling procedure

All pregnant women with one previous CS delivered during the study period were included and data collection continued until the sample size was achieved.

5.8 Data collection

A structured questionnaire was used for data collection. All women with one previous CS admitted in the labour ward were identified immediately on admission by research assistants or principal researcher, the name and registration number were taken for easy tracing. The files were written "one previous" CS.

The research assistants and principal researcher filled the questionnaire after the mother has delivered in their admitting wards. Those who had elective CS were interviewed by the nurses from their admitted antenatal wards where by each nurse was responsible for two wards found in the same floor. Indications for the previous CS were obtained from the files and other records. When missing they were obtained by asking women themselves.

Operation theatre, labour ward and postnatal ward records were checked daily to make sure that all cases were collected. After delivery the mother and foetus were observed for the first 24 hrs during which information on foetal and maternal outcome were collected. The principal researcher checked all filled questionnaires daily. Any missing information was traced to the labour wards and theatre records and filled immediately. Any problem arised during data collection was discussed with research assistants and appropriate measure taken.

5.9 Training of research assistants

Five nurse midwives; two from the labour ward, two from the antenatal wards, and one from fast track were selected as research assistants. One day training was conducted on the aim of the study, how to get information from the mother and medical records, and filling of the questionnaire. The nurses in Labour Ward were arranged in such away that in the day and night shift one was available.

5.10 Pilot study

A pilot study was conducted for duration of one week. This assessed flow of variables in the questionnaire, easy of obtaining the information and other important omissions. Necessary changes or omissions were corrected. The data were entered into the computer and initial association of variables determined.

5.11 Study variables

Maternal and foetal variables collected include gravidity, parity, mode of delivery, estimated blood loss (EBL), indication for repeat CS, an APGAR score at 5 minutes, birth weight in grams and condition of babies after 24 hrs.

Immediate maternal outcome variables include ruptured uterus, abdominal hysterectomy

5.12 Data analysis

The data were entered into a computer using EPI Info 2002 program. Frequency distribution and measure of location were used to summarize data. Statistical association between variables were calculated using Chi-square test where relevant, P-value of less

than 0.05 was considered statistically significant.

5.13 Ethical consideration

Ethical clearance was obtained from research and publication committee of Muhimbili University of Health and Allied Sciences (MUHAS) and permission to conduct the study was obtained from the Executive Director of MNH. Details of the study were explained to the patient and verbal consent sufficed one to be included in the study-
Patients who developed complications were managed according to the hospital guidelines.

5.14 Definition of terms

- Successful TOS: Vaginal delivery in TOS before decision for failure is made and no ruptured uterus.
- APGAR score: A scoring method used to evaluate the well being of a new born baby. It is done as soon as the baby is delivered (first minute of life) and repeated five minutes later. The first one assesses the need for resuscitation and the later assesses the fetal well being. They are scored by looking their skin colour, respiratory effort, heart rate, reflexes irritability and the muscle tone. The total score is 10, the Apgar score 7-10 is said to be a normal score and <7 is called a low score [1].

6.0 RESULTS

A total of 3285 women were delivered at MNH from 13th September 2006 to 2nd February 2007. Out of which 365(11.1%) had one previous CS. Seven women were excluded from the study because; three had stillbirth macerated of less than one kg body weight, one had abdominal pregnancy and 3 case notes were missing thus remaining with 358 women for analysis.

Most women were between 20-29 years old and primiparous, educated to primary level 227(63.4) and were house wives 253(70.7%).

Eighty women (22.3%) had TOS out of which 41(51.2%) had successful TOS. Three women delivered vaginally while waiting for CS making a total number of vaginal delivery resulted from TOS to be 44(55%).

Two hundred and seventy eight women (77.7%) had the decision for repeat CS made on admission whereby 179(64.4%) were for EmRCS and 99(35.6%) were for ERCS. Eight women from EmRCS delivered vaginally while waiting for CS. Most women in ERCS were coming from fast track 55(55.6%). Dystocia accounted for 63% of the failed TOS and was the main indication for repeat CS (43.5%). It also contributed to 62.6% of the indication for the first CS.

There is no difference in foetal outcome between women in TOS and those repeat CS was done. ERCS resulted in better APGAR score than EmRCS (p=0.004). There were seven ruptured uterus all in emergency repeat CS. The mean duration of decision for failed TOS to delivery was three hours.

Table 1: Socio-demographic characteristics of women with one previous CS according to decision for mode of delivery

Characteristic	Decision on mode of delivery TOS N=80 n(%)	Repeat CS N=278 n(%)	Total N=358 n(%)
Age group			
<20	2(2.5)	7(2.5)	9(2.5)
20-29	55(68.8)	158(56.8)	213(59.5)
≥30	23(28.7)	113(40.6)	136(38.0)
Gravidity			
2	42(52.5)	171(61.5)	213(59.5)
3	18(22.5)	56(20.1)	74(20.7)
4	14(17.5)	31(11.2)	45(12.6)
>4	6(7.4)	20(7.2)	26(7.3)
Parity			
1	43(53.8)	191(68.7)	234(65.4)
2	18(22.5)	45(16.2)	63(17.6)
3	15(18.8)	29(10.4)	44(12.3)
≥4	4(4.9)	13(4.7)	11(3.1)
Number of living Children			
0	8(10.0)	45(16.2)	53(14.8)
1	44(55.0)	179(64.4)	223(62.3)
2	17(21.2)	33(11.9)	50(14.0)
≥3	11(13.6)	21(7.6)	32(9.0)
Marital status			
Married	75(93.7)	260(93.6)	335(93.6)
Single	5(6.2)	18(6.5)	23(6.4)
Education level			
No formal education	8(10.0)	12(4.3)	20(5.6)
Primary school	56(70.0)	171(61.5)	227(63.4)
≥Secondary education	16(20.0)	95(34.2)	111(31)
Occupation			
Housewife	70(87.5)	183(65.8)	253(70.7)
Peasant	2(2.5)	4(1.4)	6(1.7)
*Income gener.source +ve	7(8.8)	83(29.8)	90(25.1)
Others	1(1.2)	8(2.9)	9(2.5)
Category of care			
Normal track	73(91.2)	204(73.4)	277(77.4)
Fast track	7(8.8)	74(26.6)	81(22.6)
±Where attended ANC			
MNH	15(19.0)	147(53.1)	162(45.5)
Municipal hospital	0(0.0)	11(4.0)	11(3.1)
Private/NGO hospital	3(3.8)	8(2.9)	11(3.1)
Dispensary	57(72.2)	93(33.6)	150(42.1)
Health centre	4(5.1)	18(6.5)	22(6.2)

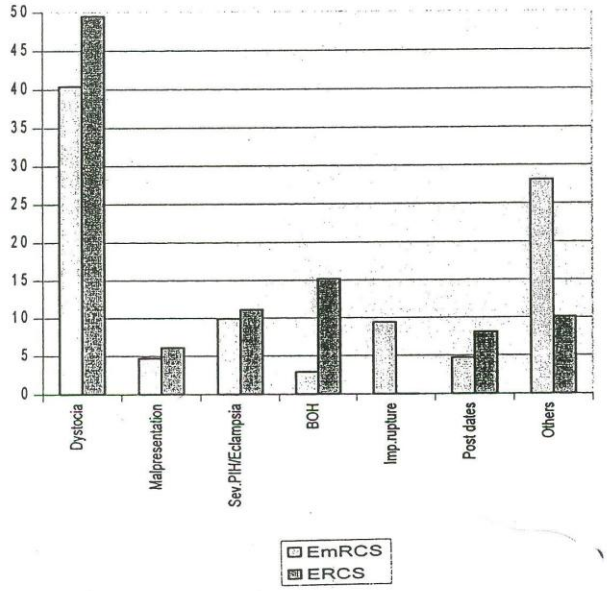
*Income gener.source +ve: Presence of income generating source (Employed and petty trader)

± Two women one from TOS and one from repeat CS did not attend ANC making a total of ANC attendance to be 356.

Most women were between 20-29 years old and primiparous. Most of them were educated to primary level 227(63.4) and were house wives 253(70.7%).

Women with no living children, more educated, income gener.source +ve, from fast track and those who were attending ANC at MNH were more subjected to operation compared to others.

Figure 1: Distribution of main indication for repeat CS in patients delivered by CS following decision for CS on admission (N=270)



*Dystocia includes: Obstructed labour, CPD and poor progress of labour.

BOH: Bad obstetric history

Imp. rupture: Impending rupture

Others include: Multiple pregnancy, PROM/ cord prolapse, VVF and Antepartum haemorrhage.

EmRCS: Emergency repeat CS, ERCS: Elective repeat CS

Dystosia was found to be the commonest indication for repeat CS and was higher in the ERCS group than EmRCS

Table 2 Distribution of women according to indication for the previous CS and decision for mode of delivery.

	Decision for mode of delivery			
	TOS N=80	EmRCS N=179	ERCS N=99	Total N=358
Ind. of prev delivery	n(%)	n(%)	n(%)	n(%)
Dystocia*	43(19.2)	124(55.4)	57(25.4)	224(62.6)
Malpresentation	22(40.0)	24(43.6)	9(16.4)	55(15.4)
APH	6(40.0)	4(26.7)	5(33.3)	15(4.2)
Severe PIH/Eclampsia	4(20)	12(60)	4(20)	20(5.6)
Others	5(11.4)	15(34.1)	24(54.5)	44(12.3)

*Dystocia includes: Obstructed labour, CPD and poor progress of labour

Ind.of prev.delivery: Indication of previous delivery

EmRCS: Emergency repeat CS

ERCS: Elective repeat CS

Others includes: Foetal distress, bad obstetric history, failed induction, cord prolapse and repaired VVF.

Dystocia was the commonest indication of the previous CS (62.6%) and majority of these women were decided to deliver by repeat CS. Decision for TOS was more common in women whose previous indication for CS were APH and malpresentation.

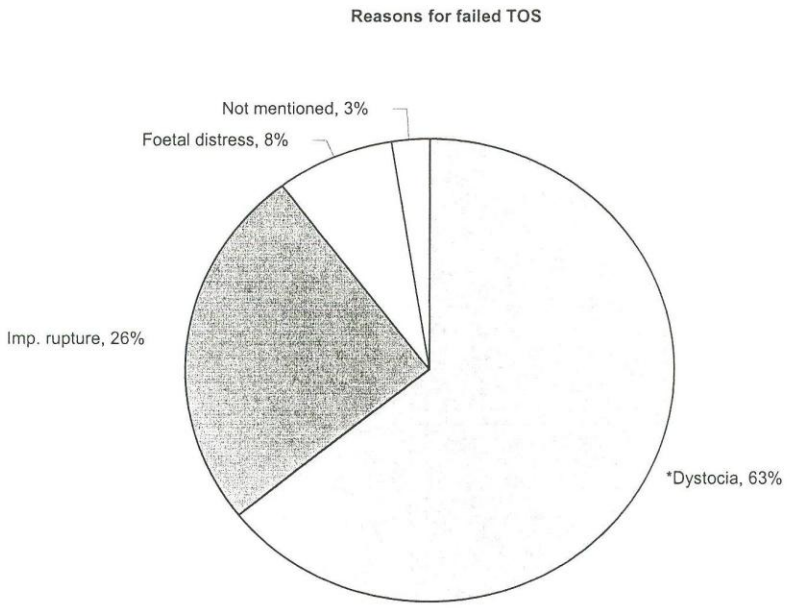
Table 3: Mode of delivery in TOS according to indication for previous CS.

	Mode of delivery TOS		
	Vag. delivery N=44	CS N=36	Total N=80
Ind. of prev delivery	n(%)	n(%)	n(%)
Dystocia*	23(53.5)	20(46.5)	43(53.8)
Malpresentation	14(63.6)	8(36.4)	22(27.5)
APH	4(66.7)	2(33.3)	6(7.5)
Severe PIH/Eclampsia	2(50)	2(50)	4(5.0)
Others	1(20)	4(80)	5(6.3)

*Obstructed labour, CPD and poor progress of labour

Women whose previous indication for CS are malpresentation and APH were more successful in TOS than those with dystocia.

Figure 2: Reasons for failed TOS (N=39)



*Dystocia includes: Poor progress of labour, obstructed labour and CPD

Imp. rupture: Impending rupture

Majority of women in Failed TOS were due to Dystocia followed by impending rupture. Three women out of 39 delivered vaginally after decision for failed TOS. The reason for failed TOS in all three was Dystocia.

Table 4: Maternal and foetal outcome according to mode of delivery.

	TOS N=80		Repeat CS N=270	
	Vaginal delivery	CS after TOS	EmRCS	ERCS
Item	N=44	N=36	N=171*	N=99
	n(%)	n(%)	n(%)	n(%)
Maternal outcome				
Blood loss (mls)				
<500	41(93.2)	16(44.4)	61(35.7)	8(28.3)
>500mls	3(6.8)	20(55.6)	110(64.3)	71(71.7)
Visceral injury				
No injury	44(100)	36(100)	164(95.9)	99(100)
Rupt. uterus	0(0.0)	0(0.0)	7(4.1)	0(0.0)
Foetal outcome				
Apgar score				
0-3	5(11.4)	4(11.1)	10(5.8)	2(2.0)
4-6	2(4.5)	2(5.6)	13(7.6)	0(0.0)
7-10	37(84.1)	30(83.3)	148(86.5)	97(98.0)
Birth weight(gm)				
<2500	9(20.5)	3(8.3)	15(8.8)	8(8.1)
2500-3499	28(63.6)	24(66.7)	111(64.9)	59(59.6)
≥3500	7(15.9)	9(25)	45(26.3)	32(32.3)
Condition of babies after 24Hrs				
Well	39(88.6)	30(83.3)	151(88.3)	96(97.0)
Sick	1(2.3)	2(5.6)	13(7.6)	1(1.0)
Dead	4(9.1)	4(11.1)	7(4.1)	2(2.0)

*Eight women planned for EmRCS delivered vaginally then were excluded.

There is slight increase in blood loss in women in EmRCS and ERCS.

There were seven uterine rupture all in the EmRCS.

The APGAR score of ≥7 were more observed in ERCS (98%) than in EmRCS (86.5%) and vaginal delivery after TOS (84.1%) or CS after TOS (83.3%)

The foetal out come from ruptured uterus was two still birth fresh, one score 4-6 and four score 7-10 babies. Most of the ruptured uterus diagnosed intraoperatively. One woman died within 24 hours post operatively.

7.0 DISCUSSION

This study has some limitations which affect the results and its interpretation. The sample size was relatively small due to time limit. This makes comparison of maternal and foetal outcome between TOS and CS difficult. A large sample size is needed to observe difference in the two groups. In the study sample few women were subjected to TOS and this was more noticeable in the women whose previous indication for CS was dystocia. The criteria used to select women eligible for TOS was not known thus may affect the interpretation of the success of TOS. Patients who did not deliver at MNH or their records were mising; the indications for the primary CS were mentioned by the patients themselves. This data could be more reliable if indications could be obtained from hospital data.

In this study a considerable small number of women were subjected to TOS 80(22.3%). This rate is small when compared to other studies [22, 37]. The low proportion can be speculated as a result of pressure on doctors and patients of getting a good scored baby. Doctors' fear on being blamed for possible complications which may develop during TOS is another important drawback. Some studies show that; TOS increases the risk of uterine rupture which may result into foetal loss and /or loss of fertility[28]. From this reason a doctor may prefer to select CS.

More than half of women underwent TOS had successful vaginal delivery 44(55%). This rate was lower compared to other studies where by in most studies the rate is between 60-

80% [20, 21, 22, 24] but higher than other studies [14, 18, 23]. This difference may be due to either premature decision for failed TOS or differences in selection of eligible cases for TOS.

The indication of the first CS is among the factors associated with success rate in TOS. The success rate is much better when the primary indication for CS is due to non recurrent indication for CS [18, 23]. In our study more than half of women subjected to TOS from dystocia group attained successful TOS. Despite the high success rate the proportion of dystocia subjected to TOS was small. This suggests the selection bias. The success in TOS was higher in those whose previous indications for CS were malpresentation and APH. The finding is in contrary to the study done 2004 in South Africa by Van Bogaert whereby a retrospective audit of the partogram of the 202 VBAC was done. The indication for the primary CS in terms of recurrent/ non recurrent did not affect the subsequent mode of delivery [38]. In another hand Durnwald in Ohio 2004 on his study done to predict the success of TOS, women with known previous indication for CS as dystocia were also subjected to TOS. His findings were more related to favourability of the cervix. He found that women with most favorable cervix at initial examination were more likely to be successful [24].

Among the women with one previous scar delivered 162(45.5%) were attending clinic at MNH and 150(42.1%) were attending at dispensaries. Of the 358 women only 130 had their mode of delivery planed. Most of them were from fast track planned for ERCS and few for TOS at the onset of labour. In this study the rate of EmRCS was higher than elective. This finding is proved by the above ANC attendance which shows a

considerable high proportion of women who were not referred to the hospital as per Ministry of Health RCH-4 card. According to this card, all women with previous scar should attend the hospital for antenatal care and properly planed for delivery. In a good working system more ERCS are expected than emergency.

The most threatening risks to the obstetrician when allowing trial of scar is fear of uterine rupture with threat of injury to mother and the fetus. Studies have shown the risk of uterine rupture in women with one previous CS to be between 0.2 and 1.5 % [22, 37].
In our study symptomatic uterine rupture was not observed in TOS. This may be due to a small sample size. In studies with large samples by Landon and Lydon-Rochelle uterine rupture observed in TOS was 0.7% and 0.5% respectively [21, 28].

In our study seven women (1.95%) all from EmRCS group had uterine rupture while waiting for CS. This result may have association with hospital delays in which the decision to intervention time was found to be three hours. In such long time it is enough for a woman with impending rupture or any other critical condition to develop complications. The decision to intervention time delay has been observed in the previously done studies [35, 39, 40]. This delay is far from WHO recommendations of 30 minutes. This situation needs to be improved in order to reduce perinatal and maternal mortality and morbidity as well.

Our study demonstrates that maternal and neonatal outcome were relatively comparable between the women successful delivered vaginally and those underwent emergency CS

after failed TOS. The APGAR score at five minute ≥7 was more observed in ERCS (98%). The results of this study is consistent to that obtained by Aisien in Nigeria [37]. Babies who had birth weight of less than 2500g delivered vaginally when TOS was done. The success rate decreased with increasing birth weight. This finding is similar to the findings in the study done at Pannsylvania University on the effect of birth weight and success of TOS [41].

8.0 CONCLUSION

The proportion of women undergo TOS (22.3) is small. More than half women subjected to TOS delivered vaginally with good APGAR score.

Maternal and foetal complications were more pronounced in emergency CS than in elective and TOS. There is no difference in maternal and foetal morbidity between women in successful TOS and those in repeat CS after failed TOS.

9.0 RECOMMENDATIONS

Doctors should be encouraged to offer TOS to pregnant women with one previous caesarean section.

There is a need to establish clinical auditing of management of women with one previous CS using strict criteria. There is also a need to prepare criteria for referral and delivery of all women with one previous CS as many women come while in labour.

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APPENDIX I: QUESTIONNAIRE-ENGLISH VERSION

OBSTETRIC OUTCOME AMONG MOTHERS WITH ONE PREVIOUS CAESAREAN SECTION AT MUHIMBILI NATIONAL HOSPITAL.

IDENTIFICATION			
Name of the mother_____ Reg. No./__/__/__/__/__/__/__/ Date ___/___/200__ Questionnaire No. __/__/__/__/			
1	**SOCIODEMOGRAPHIC CHARACTERISTICS**		
1.1	Age in completed years	/__/__/ years	
1.2	Gravidity	/__/__/	
1.3	Parity	/__/__/	
1.4	Number of living children	/__/__/	
1.5	LNMP ___/___/200__ Gestation age	/__/__/ weeks	
1.6	What is your marital status?	1. Married 2. Single 3. Cohabiting 4. Divorced	
1.7	What is the highest level of education you attained?	1. No formal education 2. Didn't complete primary education 3. Completed primary education 4. Secondary education 5. College after secondary education	
1.8	What is your occupation?	1. Housewife 2. Peasant 3. Employed 4. Petty trader 5. Others (specify)_____	
2	**PREGNANCY CARE**		
2.1	Category of care	1. Normal track 2. Fast track	
2.2	Where is the mother from?	1. Home 2. MNH antenatal clinic 3. Antenatal ward 4. Referred from peripheral hospital 5. Other (specify) _____	
2.3	If referral, what is the reason	Mention:_____ __	
2.4	Did you attend antenatal care?	1. Yes 2. No	
2.5	If YES, where did you attend	1. MNH	

	antenatal care?	2. Municipal hospitals 3. Private/NGO hospitals 4. Dispensary 5. Health centre	
2.6	Look into the RCH 4 card: Was the mode of delivery planned?	1. Yes 2. No	
2.7	If YES, What was the planned mode of delivery?	1. Elective repeat CS 2. Trial of the scar	
2.8	Do you know the reason for the previous CS?	1. Yes 2. No	
2.9	If YES, What was the reason for the previous CS	Mention:	
210	If NO use Qns criteria to obtain the indication	Mention:	
2.11	Had you vaginal delivery before the previous CS?	1. Yes 2. No	
2.12	If YES, how many times did you have vaginal deliveries before the CS?	Number /___/___/	
2.13	How many times have you delivered after the CS?	Number /___/___/	
3	**DELIVERY**		
3.1	Decision for mode of delivery on admission	1. Repeat CS 2. Trial of scar	
3.2	If repeat CS, is it emergency or elective?	1. Emergency 2. Elective	
3.3	Indication for the repeat CS	Mention:	
3.4	If trial of scar, was the trial of scar successful?	1. Successful TOS 2. Failed TOS	
3.5	If failed trial of the scar, what was the reason for failed trial of the scar?	Mention:	
3.6	Was the alert line crossed in the partograph?	1. Yes 2. No 3. Not filled	
3.7	What was the duration of decision for failed trial of the scar to delivery?	/___/___/___/___/ minutes	
3.8	What was the mode of delivery?	1. Vaginal delivery 2. CS	
3.9	Duration of labour	_/__/__/__/__/ minutes	

4	**MATERNAL OUTCOME**		
4.1	Estimated blood loss	/ / / / / mls	
4.2	Visceral injury	1. No injury 2. Ruptured uterus 3. bladder injury 4. Intestinal injury	
4.3	If ruptured uterus, what was the operation done?	1. Repair of uterus 2. Subtotal hysterectomy 3. Total hysterectomy	
4.4	Maternal condition after 24 hours	1. Well 2. Sick 3. Dead	
5	**FOETAL OUTCOME**		
5.1	Sex	1. Male 2. Female	
5.2	APGAR score at 5 minutes	/ / /	
5.3	Weight	/ / / / / grams	
5.4	Admission to neonate ward	1. Yes 2. No	
5.5	Condition of the baby after 24 hours	1. Well 2. Sick 3. Dead	

APPENDIX II: QUESTIONNAIRE-SWAHILI VERSION

MATOKEO YA UZAZI MIONGONI MWA AKINA MAMA AMBAO WAMEWAHI KUPASULIWA MARA MOJA KATIKA MIMBA ZILIZOPITA WANAOJIFUNGUA KATIKA HOSPITALI YA TAIFA YA MUHIMBILI.

UTAMBULISHO			
Jina la mama _____ Na. ya jalada /__/__/__/__/__/__/__/__/ Tarehe___/___/200__ Na. ya usaili __/__/__/__/			
1	**DEMOGRAFIA YA JAMII**		
1.1	Umri kwa miaka	Miaka /__/__/	
1.2	Mimba ya ngapi?	/__/__/	
1.3	Umezaa mara ngapi?	/__/__/	
1.4	Idadi ya watoto walio hai?	/__/__/	
1.5	LNMP ___/___/200__ Umri wa mimba	Wiki /__/__/	
1.6	Hali ya ndoa	1 Nimeolewa 2 Sijaolewa 3 Ninaishi na bwana 4 Nimeachika	
1.7	Umesoma mpaka darasa la ngapi?	1 Sikusoma kabisa 2 Sikumaliza shule ya msingi 3 Nimemaliza shule ya msingi 4 Nimemaliza sekondari 5 Nimemaliza chuo	
1.8	Unafanya kazi gani?	1 Mama wa nyumbani 2 Mkulima 3 Nimeajiriwa 4 Mfanya biashara ndogo ndogo 5 Kazi nyengine (Eleza)_____	
2	**MAELEZO YA UJAUZITO**		
2.1	Unatibiwa kwa njia ipi?	1 Njia ya kawaida 2 Njia ya kulipia	
2.2	Mama ametokea wapi?	1 Nyumbani 2 Clinic ya wajawazito MNH 3 Wodini 4 Toka hospitali nyengine 5 Sehemu nyengineyo (Eleza) _____	
2.3	Ikiwa ametoka hospitali nyengine, ni kwa sababu gani?	Eleza:_____	
2.4	Ulikwenda clinic ya wajawazito kupima?	1 Ndio 2 Hapana	

2.5	Kama ndiyo, ni klinik ya wapi?	1 MNH 2 Hospitali ya manispaa 3 Klinik ya kulipia /Mashirika yasiyo ya serikali 4 Zahanati 5 Kituo cha afya	
2.6	Angalia kadi RCH 4: Jee alipangiwa azae kwa njia gani?	1 Ndiyo 2 Hapana	
2.7	Kama ndiyo ni njia ipi?	1 Kwa kupasuliwa 2 Kwa njia ya kawaida	
2.8	Jee unaijua sababu ya kupasuliwa katika mimba yako iliyopita?	1 Ndiyo 2 Hapana	
2.9	Kama ndiyo, ni sababu gain?	Eleza: _____	
210	Ikiwa hapana, Uliza maswali maalum ili ujue sababu.	Eleza: _____	
2.11	Jee umeshawahi kuzaa kwa njia ya kawaida?	1 Ndiyo 2 Hapana	
2.12	Ikiwa ndiyo, umezaa mara ngapi kwa njia ya kawaida kabla ya kupasuliwa?	Nambari /___/___/	
2.13	Umezaa mara ngapi kwa njia ya kawaida baada ya kupasuliwa?	Nambari /___/___/	
3	**MAELEZO KUHUSUUZAZI**		
3.1	Uamuzi wa njia ya kuzalishwa wakati mgonjwa anapolazwa	1 Kupasuliwa 2 Njia ya kawaida	
3.2	Ikiwa ni kwa kupasuliwa, Jee ni kwa dharura au kwa kupangiwa	1 Dharura 2 Kupangiwa	
3.3	Sababu ya kupasuliwa kwa mara ya pili	Eleza: _____	
3.4	Ikiwa alipangiwa kuzaa kwa njia ya kawaida , Jee imefanikiwa?	1 Imefanikiwa 2 Haikufanikiwa	
3.5	Ikiwa haikufanikiwa, ni kwa sababu gain?	Eleza: _____	
3.6	Jee mstari uitwao alert line wa partograph umevuukwa?	1 Ndiyo 2 Hapana 3 Haikujazwa	
3.7	Muda gani umepita tangu iamuliwe kushindikana kujifungua kawaida ulipoekwa hadi mzazi anapojifungua	Dakika /___/___/___/___/	

3.8	Jee amezaa kwa njia ipi?	1 Njia ya kawaida 2 kupasuliwa	
3.9	Muda gani umepita tangu kuanza uchungu mpaka kujifungua	Dakika_/__/__/__/__/	

4	**MAELEZO YA MAMA**		
4.1	Makisio ya damu iliyotoka	/__/__/__/__/__/ mls	
4.2	Madhara ya viungo vya ndani	1 Hakuna 2 Kupasuka kwa mfuko wa uzazi 3 Kupasuka kwa kibofu cha mkojo 4 Kuumia kwenye utumbo	
4.3	Ikiwa amepasuka mfuko wa uzazi amefanyiwa upasuaji gani?	1 Kushonwa mfuko wa uzazi 2 Kutolewa sehemu ya mfuko wa uzazi 3 Kutolewa mfuko wote wa uzazi	
4.4	Hali ya mama baada ya masaa 24	1 Nzuri 2 Mbaya 3 Amekufa	
5	**MAELEZO YA MTOTO**		
5.1	Jinsia	1 Wa kike 2 Wa kiume	
5.2	APGAR baada ya dakika tano	/__/__/	
5.3	Uzito wa mtoto anapozaliwa	Gram /__/__/__/__/	
5.4	Kulazwa wodi ya watoto wachanga	1 Ndiyo 2 Hapana	
5.5	Hali ya mtoto baada ya masaa 24	1 Nzuri 2 Mbaya 3 Amekufa	