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COMPARISON BETWEEN THE OUTCOME OF TRIAL OF LABOUR AND ELECTIVE REPEAT CAESAREAN SECTION IN KIAMBU DISTRICT HOSPITAL: A RETROSPECTIVE COHORT STUDY

B. N. Musila, MBChB, MMed, Department of Obstetrics and Gynaecology, Mwingi District Hospital, K. Kamau, MBChB, MMed, Associate Professor of Obstetrics and Gynaecology, O. Gachuno, MBChB, MMed, Lecturer, Department of Obstetrics and Gynaecology, School of Medicine, College of Health Sciences, University of Nairobi and consultant Obstetrician and Gynaecologist, Kenyatta National Hospital, P.O. Box 20723-00202, Nairobi, Kenya

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B. N. MUSILA, K. KAMAU and O. GACHUNO

ABSTRACT

Objective: To determine the pregnancy outcomes in patients with one previous Caesarean section scar who underwent trial of labour as compared to those who had elective repeat Caesarean section at Kiambu District Hospital.

Design: A retrospective cohort study.

Setting: Post natal wards of Kiambu District Hospital.

Subjects: Medical records of all mothers with one previous Caesarean section scar who had delivered in Kiambu District Hospital were obtained and the information used to fill questionnaires. Maternal morbidity was assessed primarily based on post-natal hospital stay. Other maternal morbidity measures assessed included occurrence of uterine rupture, maternal death, need for hysterectomy, maternal blood loss, presence of visceral injury (bladder or gut) and post delivery infectious morbidity. In addition, the failure rate of trial of labour was determined. Foetal outcome was assessed based on APGAR score at five minutes, need for admission to the new born unit and the occurrence of early neonatal death.

Results: A total of 142 participants were recruited of which 71 had undergone TOL and 71 had undergone ERCS. Clinical pelvimetry was the most common criteria used for selection of patients for TOL since 100% of all patients in the TOL group were assessed this way as compared to 80.3% in the ERCS group. The success rate of TOL was 50.7% in this study. Successful TOL was associated with less hospital stay since 91.6% stayed for two days or less as compared to ERCS where 84.5% stayed for 3-4 days ($P < 0.001$). Similarly, blood loss was less for those who had successful TOL where 97.2% lost less than 500mls as compared to ERCS where 85.9% lost 500mls or more. Maternal outcomes were worse in the 49.7% who failed TOL since only 57.1% of them had a post-natal hospital stay of three to four days as compared to 84.5% in the ERCS group ($p = 0.029$) and 42.9% of the failed TOL group stayed in the hospital for five days or more as compared to only 15.5% in the ERCS group ($p = 0.002$). Foetal outcome was worse in the TOL group since 11.3% had an APGAR score of less than eight at five minutes as compared to only 1.4% in the ERCS group ($p = 0.016$). Similarly, 14.1% of newborns in the TOL group were admitted to the new born unit as compared to only 5.6% in the ERCS group ($p = 0.091$). There were no early neonatal deaths reported in both groups.

Conclusion: Overall success rate for TOL was low necessitating emergency Caesarean section of which the maternal outcomes were worse than in the ERCS group. The foetal outcomes were better in the ERCS group as compared to the TOL group.

INTRODUCTION

A previous uterine scar has for a long time been considered a contraindication for trial of labour for fear of uterine rupture. Indeed in 1916, Cragin made the pronouncement that 'once a Caesarean always a Caesarean'(1). Over the years, this view has been challenged and in 1980, the consensus development conference on Caesarean childbirth concluded that vaginal delivery after one previous lower uterine segment Caesarean section was a safe and acceptable option in a singleton vertex presentation and not an absolute indication for a Caesarean section.

However in the 1990's this opinion began to lose ground despite there being many studies which showed high success rate of trial of labour after one previous Caesarean section ranging between 55-85%. Koigi Kamau *et al* (2) found out in their study on perceptions, preferences and practice of privately practicing obstetricians in Kenya that TOL was the preferred mode of delivery. In addition, 90% of obstetricians routinely suggested TOL to their patients with one Previous Scar (PS). The obstetricians' perception was that 83% of women preferred TOL as opposed to ERCS.

Currently, data available from developed countries shows that the failed TOL rate ranges between 15-45%, with a uterine rupture rate for one previous scar at 1% and two previous scar 2% (1). A study done at KNH found that the uterine rupture rate was 3.14% in patients undergoing TOL with 1 previous scar(3). Another study done at Pumwani maternity hospital revealed that the success rate of TOL in that institution was 45.5%(4). Thus it is important to compare these figures with data generated from district (level IV) hospitals. The main objective of this study was to compare the outcome of pregnancy in patients with one previous Caesarean section scar who underwent TOL to those delivered by ERCS in Kiambu district hospital.

MATERIALS AND METHODS

Design: This was a retrospective cohort study. The cohort consisted of women with one previous Caesarean section who had delivered at the hospital. On one hand there were those who had TOL and on the other those who had elective repeat Caesarean section. The records of events and eventual outcome were tracked and compared. Any decision making processes that were documented were also considered.

Setting: Kiambu District Hospital maternity unit and

medical records department.

Study population: The study population consisted of sequentially selected mothers with one previous Caesarean section for their last delivery. On one arm were those who had been allowed TOL while on the other were those who had ERCS. Since the study was retrospective the researchers were not involved in decision making as to who underwent TOL or ERCS. Thus the decisions on mode of delivery reflected what happens on the ground without any external influence. Inclusion criteria was all patients with one previous scar delivered by elective Caesarean section, all patients with one previous scar who were allowed trial of labour, a gestational age by dates of more than 34 weeks and those destined for elective Caesarean section should not have been in labour. Those patients with one previous scar who had been laboring elsewhere and referred to the study site for emergency Caesarean section were excluded from the study.

Sample size estimation was based on assumptions regarding the average length of hospital stay in the two groups and a sample size of 142 participants was obtained, 71 in each of the two arms.

Data collection and management: The mainstay of identifying the participants was the labour ward delivery register. The inpatient numbers of all the mothers with one previous Caesarean section scar who had been admitted to labour ward for delivery from the beginning of the study were noted. The files were retrieved from the records department, studied and used to fill questionnaires. This information was extracted retrospectively and sequentially until the sample size was obtained. This was done with the assistance of data clerks.

Data analysis: The questionnaires were coded and entered in an MS access database. Data cleaning was done with the assistance of a biostatistician and analysis performed using SPSS 17.0. No serious ethical issues were encountered since this was a retrospective study involving documentation of existing practices without influencing the clinical practice.

RESULTS

A total of 142 participants were included in the study. 71 of them had undergone trial of labour and the other 71 had undergone elective repeat Caesarean section.

Table 1
Socio-demographic and reproductive characteristics

Characteristic	TOL N=71	ERCS N=71	OR	p-value
Socio-demographic	No. (%)	No. (%)		
Age				
≤ 20	8 (11.2)	5 (7.0)	Ref.	
21-25	22 (31.0)	25 (35.3)	1.8	
26-30	21 (30.0)	28 (39.4)	2.1	0.492
31-35	13 (18.3)	8 (11.3)	1.0	
36+	7 (9.8)	5 (7.0)	1.1	
Marital Status				
Single	0	1 (1.5)	-	
Married	70 (98.5)	70 (98.5)	-	0.368
Separated	1 (1.5)	0	-	
Education level				
None	3 (4.2)	1 (1.4)	Ref.	
Primary	39 (55.0)	38 (53.5)	2.9	0.500
Secondary	25 (35.2)	24 (33.8)	5.3	
Tertiary	4 (5.6)	8 (11.3)	6.0	
Occupation				
Unemployed	49 (69.0)	33 (46.5)	Ref.	
Casual	3 (4.2)	8 (11.3)	4.0	0.048
Formal	4 (5.7)	7 (9.9)	2.6	
Self employed	15 (21.1)	23 (32.3)	2.3	
Reproductive				
ANC Attendance				
Centre attended				
Kiambu DH	22 (31.0)	33 (46.5)	Ref.	
Dispensary	17 (23.8)	6 (8.5)	0.4	
Private Hospital	1 (1.4)	9 (12.6)	6.0	0.003
Health Centre	30 (42.4)	20 (28.2)	0.4	
None	1 (1.4)	3 (4.2)	2.0	
Parity Grouped				
1	47 (66.2)	48 (67.6)	Ref.	
2	13 (18.3)	12 (16.9)	0.9	0.841
3+	11 (15.5)	11 (15.5)	1.0	

Table 1 shows the distribution of socio-demographic and reproductive characteristics. There were no significant socio-demographic differences between the two groups.

Table 2
Outcome of TOL in terms of eventual mode of delivery and reason for failed TOL

Outcome/Reason	No.	(%)
Outcome N=71		
TOL successful	36	(50.7)
TOL failed	35	(49.3)
Reason for failure N=35		
Non reassuring fetal status	2	(5.7)
Cephalopelvic disproportion	4	(11.4)
Impending uterine rupture	2	(5.7)
Foetal malpositioning	3	(8.6)
Poor progress of labour	15	(42.9)
Others	9	(25.7)

Table 2 shows the outcome of TOL in terms of eventual mode of delivery and reason for failed TOL. Among those who had TOL, 50.7% were successful in achieving vaginal birth while 49.3% failed TOL and underwent emergency Caesarean section. The main reason for failed trial of labour was poor progress constituting 42.9%. When this was combined with cephalopelvic disproportion, it represented 54.3% of all the mothers in the failed TOL group. Impending rupture of the uterus, a potential cause of maternal and neonatal morbidity was cited as a reason for emergency Caesarean section in 5.7% of those who

failed TOL.

As shown on table 3 the mothers who had successful TOL had less morbidity. In the post-natal hospital stay 91.6% stayed for less than two days as compared to none in the failed TOL group. Similarly, only 2.9% stayed for five days and above as compared to 42.9% in the failed TOL group.

Failure of TOL was associated with more blood loss since 71.4% lost above 500mls as compared to successful TOL where 97.2% lost less than 500mls. There was no significant difference in the fetal outcome between the two groups.

Table 3
Pregnancy Outcome among TOL patients

Outcome parameter	TOL N =35			OR	p-value
	Successful ToL N=36	Failed ToL N=35			
Hospital Stay (days)	No. (%)	No. (%)			
≤ 2	33 (91.6)	0 (0.0)	-		
3 - 4	2 (5.5)	20 (57.1)	Ref		<0.001
≥5	1 (2.9)	15 (42.9)	1.5		
Blood Loss					
< 500	35 (97.2)	10 (28.6)	Ref		
≥ 500	1 (2.8)	25 (71.4)	86*		<0.001
Maternal Status					
Well	35 (97.2)	21 (60.0)	Ref		
Discharged on treatment	1 (2.8)	14 (40.0)	23.0		<0.001
Fetal					
Birth Weight					
<2,500	3 (8.3)	3 (8.5)	Ref.		

≥ 2500	33 (91.7)	32 (91.4)	1.0	0.971
Apgar score				
8-10	32 (88.8)	31 (88.5)	Ref	
<8	4 (11.2)	4 (11.5)	1.0	0.966
Fetal status				
Well	33 (91.7)	28 (80.0)	Ref	
Adm. NBU	3 (8.3)	7 (20.0)	2.8	0.158

As shown on Table 4, the outcomes were better for those who had successful TOL as compared to ERCS. Ninety one point six percent of mothers in the TOL group had a post-natal hospital stay of two days or less as compared to none in the ERCS group ($p < 0.001$). Similarly 97.2% of the mothers in the TOL group lost less than 500mls of blood as compared to 85.9% in the ERCS group who lost more than 500mls of

blood ($p < 0.001$). Foetal outcomes were slightly better in the ERCS group since 98.6% had an APGAR score at five minutes of eight and above as compared to 88.9% in the successful TOL group ($p = 0.025$). This is also reflected in the number admitted to NBU since 11.1% of the neonates delivered after successful TOL were admitted as compared to only 1.4% in the ERCS group.

Table 4
Pregnancy outcome by successful TOL and ERCS

Outcome	Successful TOL N = 36 No. (%)	ERCS N=71 No. (%)	p-value
Blood loss			
< 500	35 (97.2)	10 (14.1)	
≥ 500	1 (2.7)	61 (85.9)	<0.001
Hospital stay(days)			
≤2	33(91.6)	0(0)	
3-4	2 (5.5)	60(84.5)	<0.001
≥5	1(2.9)	11(15.5)	
Maternal			
well	35 (97.2)	6 (8.5)	
discharge on treatment	1 (2.7)	65 (91.5)	<0.001
Foetal outcome			
< 8	4 (11.1)	1 (1.4)	0.025
8 - 10	32 (88.9)	70 (98.6)	

As shown in Table 5, failed TOL was associated with more blood loss since 100% of mothers lost more than 500mls of blood as compared to ERCS where 14.1% lost less than 500mls and 85.9% lost more than 500mls ($p = 0.29$). Those mothers who failed TOL stayed longer in hospital since 57.1% stayed for three to four days as compared to 84.5% in the ERCS

group ($p = 0.002$). Similarly, 42.9% stayed for five days or more in the failed TOL group as compared to 15.5% in the ERCS group. The foetal outcome was poorer for those who failed TOL since 11.4% had APGAR score of less than eight at five minutes compared to only 1.4% in the ERCS group ($p = 0.022$).

Table 5
Pregnancy outcome by failed TOL (35) and ERCS (71)

Outcome	Failed TOL N = 35 No. (%)	ERCS N=71 No. (%)	OR	p-value
Blood loss				
< 500	0 (0)	10 (14.1)	-	
≥ 500	35 (100)	61 (85.9)	-	0.029
Hospital stay(days)				
≤ 2	0(0)	0(0)	-	
3-4	20(57.1)	60(84.5)	Ref	0.002
≥ 5	15(42.9)	11(15.5)	0.4	
Foetal outcome				
< 8	4 (11.4)	1 (1.4)	Ref	0.022
8 - 10	31 (88.6)	70 (98.6)	9.0	

DISCUSSION

The objective of this study was to compare the outcome of pregnancy in patients with one previous Caesarean section scar who had undergone trial of labour to those delivered through elective repeat Caesarean section. Maternal outcome was measured based primarily on the post-natal hospital stay, intrapartum estimated blood loss, intrapartum injuries and post partum infective complications. Foetal outcome was assessed based on the APGAR score at five mins and need for admission to the new born unit. All the above are indicators for morbidity.

Although some criteria was used by and large there was no specific and comprehensive criteria applied universally to all the mothers with one previous Caesarean section. Clinical pelvimetry which was the most common criteria used for decision making was noted to be a poor predictor of outcome since the success rate of TOL was only 50.7% and poor progress of labour, combined with cephalopelvic disproportion and impending uterine rupture which could be proxy indicators of pelvic inadequacy constituted 60% of the reasons for failed TOL. Radiologic pelvimetry was not employed as a method of assessment. This practice which has previously been prevalent has been abandoned in recent times since a randomised controlled study in South Africa found that antepartum ELP was a poor predictor of success in TOL and increased the Caesarean section rate (5). Similarly, Koigi Kamau, Githiru and Ndavi (6) found that a variation in the true conjugate of 10.5 cm either more or less by 5 cm did not alter the success rate of TOL. This study also documented the poor predictive value of clinical pelvimetry in the success of TOL. Documentation of criteria used for TOL was poor and arbitrary because of the desire to have one which has so far

been elusive. Other modalities that were used such as clinical estimation of foetal weight was also noted to be a poor predictor of outcome since 20% of those who were assessed in this way combined with clinical pelvimetry failed TOL.

The success rate of TOL in Kiambu district hospital was 50.7% and this is similar to a study done in Pumwani maternity hospital by Kimotho(3) where the success rate was 45.5%. This is lower than the internationally quoted success rate of 55-85% (7). The single most common reason for failure of TOL in this study was poor progress of labour representing 42.9% of those who had emergency Caesarean section. This combined with overt cephalopelvic disproportion constituted 54.3% of those who failed TOL. Considering that poor progress of labour more often than not denotes a certain degree of CPD then it can be assumed that this is a major reason for failure of TOL, and this is congruent with the Pumwani study by Kimotho (3) whereby poor progress of labour combined with CPD constituted the main reason for failure of TOL. The higher failure rate could also be attributed to the practice of not augmenting labour with oxytocin. Of note is that impending uterine rupture which is a potential cause of maternal and perinatal morbidity and mortality was present in 5.7% of those who failed TOL. Given that in our setting the consequences of uterine rupture are dire this can therefore amount to unnecessary exposure of mothers with one previous scar to excessive risk.

Whereas the pregnancy outcome is good when TOL is successful when it fails and an emergency Caesarean section is performed all aspects pregnancy appear to be much more adverse. In this study it was established that success of TOL is associated with a shorter hospital stay, less blood loss and generally less maternal morbidity as compared to failed TOL. Concerning the foetal outcome, there

was no significant difference between those who had successful TOL and those who failed and eventually had an emergency Caesarean performed. These findings are supported by a multicentre study done by Landon *et al* (8) that concluded that a trial of labour after prior Caesarean delivery was associated with a greater perinatal risk than is elective repeat Caesarean section without labour, although the absolute risks were low. Along the same line the maternal outcomes were better for those who had successful TOL as compared to ERCS although the foetal outcomes for those who had TOL were generally worse. This therefore means that generally, TOL in Kiambu district hospital is associated with poorer maternal and foetal outcomes since the success rate is low. These findings are similar to those of a study done in Pumwani maternity hospital by Kimotho (3) which concluded that maternal and foetal outcomes were poorer in mothers who underwent TOL because of low success rate in that institution.

The most important issue regarding maternal wellbeing with respect to a trial of labour after a previous Caesarean section is whether a catastrophic complication such as uterine rupture will occur and lead to serious morbidity or death. In this study there were no maternal deaths, a finding similar to that reported by Kimotho (3) and McMahon *et al* (9). No uterine rupture or hysterectomies were reported in this study. However, because of the small size of the study, larger ones are suggested so as to assess these adverse outcomes. Other weaknesses of this study include the subjective nature of assessment of some of the outcome measures, for example, estimated blood loss although this applied equally to both the study groups. Similarly, no long term follow up of the babies was made to determine whether the differences in the early neonatal morbidities observed between the two groups had major long term consequences. This could be determined by conducting long term prospective studies.

Overall this study suggests that ERCS is

associated with better maternal and neonatal outcomes as compared to TOL and these findings may apply to other level IV health facilities. It is believed that the outcome of this study can be used to counsel mothers with one prior Caesarean section scar on their choice on mode of delivery and can be used as a basis for more comprehensive studies on the subject within the country.

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