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**OUTCOME OF LABOUR FOLLOWING ONE PREVIOUS CAESAREAN SECTION
AT THE UNIVERSITY TEACHING HOSPITAL, LUSAKA.**

M. MED
THESIS
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1999

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**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENT AND FOR THE DEGREE OF MASTER OF MEDICINE
IN OBSTETRICS AND GYNAECOLOGY**

1999

DEDICATION

TO MY WIFE MAAMBO FOR ALL THE ENCOURAGEMENTS.

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ACKNOWLEDGEMENTS

Thanks to Sida / SAREC for sponsoring attendance at workshops in Tanzania and Zimbabwe on Research Methodology and data analysis. These were very useful in assisting me to develop, implement and write up my research.

Research Assistants:- Ms. Maingeni, Ms. Chipempele and Ms. Solomon for their help.

The departmental secretary Ms Rosemary Willombe

The women who took part in my study

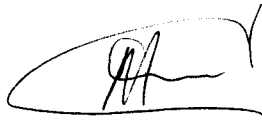
Lusaka School of Nursing caretaker Ms Msisi for allowing me to use their computer for my data entries.

Dr Y Ahmed for constant supervision, and all other senior staff in the department who had input.

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 ACKNOWLEDGMENTS.

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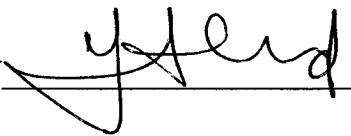
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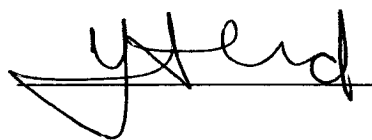
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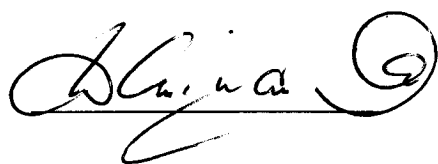
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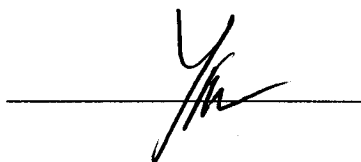
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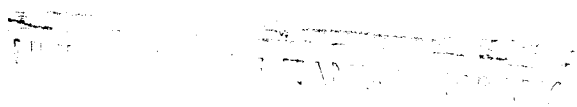
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ABSTRACT

The rate of caesarean section has been increasing in the last fifty years. A previous caesarean section has also steadily become a leading indication to perform a caesarean section. With the realization that caesarean section has got its own risks, and the strain on medical costs, the strategy has been to reduce the rate of repeat caesarean section and hence the overall rate of caesarean section. A systematic evaluation of repeat caesarean section has not been performed at the Univesrity Teaching Hospital (UTH) in the last 18 years.

In this study, the outcome of trial of labour and factors affecting outcome in previous caesarean section were assessed at UTH in 352 women who presented with one previous caesarean section over a period of 1 year between October 1995 to October 1996.

The findings were that 148 out of 352 (42.0%) had a repeat caesarean section, some of which were elective (57 out of 352 -16.2%). Of the 265 who had a trial of labour, 204 (76%) managed a vaginal delivery. Those who had a vaginal delivery after the primary caesarean had a significant higher chance of delivering vaginally (Odds Ratio 3.88 $p=0.001$). More than half of the women previously delivered by caesarean section for cephalopelvic disproportion managed to deliver vaginally. Uterine rupture occurred in 3 cases, and was not associated with birth weight, or history of previous vaginal delivery.

A trial of labour after a previous caesarean is a reasonable and moderately safe option to be followed at UTH.

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ABBREVIATIONS

APH	Antepartum haemorrhage.
BOH	Bad Obstetric History.
CPD	Cephalopelvic Disproportion.
CI	Confidence interval.
C/S	Caesarean section.
PROM	Premature Rupture of Membranes.
SAREC	Swedish Agency for Research Cooperation
SIDA	Swedish International Development Agency
SVD	Spontaneous Vaginal Delivery
UTH	University Teaching Hospital
X ²	Chi square

INTRODUCTION

The incidence of caesarean section at the University Teaching Hospital (UTH) was 10.3% of all births in 1993, 10.6% in 1994 and 10.6% in 1995. Two studies at UTH by Wadhawan in 1979 (Wadhawan, 1979) and Benema in 1993 (Benema, 1993), showed that repeat caesarean sections accounted for 37% and 20.2% respectively of all caesareans. However, there have been no studies to assess and evaluate the magnitude and factors affecting the repeat caesarean section rate at UTH. As a result, there has been poor communication between health personnel and patients on the nature of the primary caesarean section and future obstetric outcome. Due to more pregnancies at an earlier age, coupled with improvement in reproductive health services, the caesarean section rate will probably increase as will the question of management of labour in patients with previous caesarean section.

Because of the risks of caesarean section, which include higher morbidity in terms of febrile diseases, endometrial infections and reduction in fertility following such infections, transfusion requirements with their associated dangers of infection and higher maternal mortality, the strategy has been to reduce the caesarean section rate. One such area has been to tackle the excess contribution of caesarean after previous caesarean section to the overall caesarean section rate. In Europe and America and even parts of Africa, there is systematic and constant knowledge update on the outcome of labour following caesarean section and the indications for repeat caesarean section (quoted in Literature Review). Because of

this systematic knowledge, many hospitals in these areas will allow a selected group of women with even two previous caesarean sections, a trial of labour for scar.

In the two UTH studies previously cited, cases of previous caesarean section as an indication for repeat of caesarean section were only second to cephalopelvic disproportion in frequency. It is, therefore, important to study how much repeat caesarean section contributes to the overall caesarean section rate and how many of those with a previous caesarean section achieve a vaginal delivery in a subsequent pregnancy.

LITERATURE REVIEW

Before the 1950s it had been routine practice to perform a repeat caesarean section electively. This had earlier on been suggested by the dictum of “Once a caesarean section always a caesarean section” in order to circumvent the perceived catastrophe of uterine rupture and maternal and fetal death. (Saldana LR 1980). As stated by Greenhill in 1961 it had been deemed safer to perform a repeat elective caesarean section in all cases than to permit vaginal delivery (Greenhill, 1961). The rationale was that there was little or no justification for subjecting a woman to the hazards of possible uterine rupture and the sequelae of severe haemorrhage, especially when at the time, the maternal mortality of caesarean section was only 0.1 or 0.2% (Greenhill, 1961). At that time most of the data available related to the classical uterine incision which was associated with a uterine rupture rate of 4% resulting in poor maternal and fetal outcome.

In spite of the report by Riva and Teich (1961) of vaginal delivery rate following caesarean section of 74% in their series, change of policy had been slow or none. By 1978, 98.9% of all pregnant women with a previous caesarean section were delivered by caesarean section in the United States (US Department of Health and Human Services, 1991) and previous caesarean section as an indication accounted for 30% of all caesarean sections done in USA. By 1984 this figure had risen to 68% (Anderson and Lomas, 1984).

Although primary caesarean section has been accepted as one of the several factors

responsible for improving perinatal outcome, repeat caesarean section has not. This despite the fact that it contributes more than 30% of all caesarean section (Demianczuk, 1982). In Demianczuk's series a vaginal delivery rate of 54.3% was achieved and where scar dehiscence was 0.1%, but with no maternal and infant loss. It was further noted that even for a supposedly recurrent indication such as cephalopelvic disproportion, the subsequent vaginal delivery rate was 39.5%. Noteworthy was also the lack of significant association of maternal age, height, weight and mean infant weight between those who delivered vaginally and those who required a repeat caesarean section.

More data from within North American prospective cohort studies between 1982 and 1988 indicate an overall vaginal delivery rate of 54.7% in all women with previous caesarean section and 79.9% in those actually allowed to have a trial of labour for scar (Paul et al, 1985).

Although the figures above represent a more general and consistent trend, varying success rates from country to country and from institution to institution still emerge. For instance in 1992, the vaginal delivery rate of women with previous caesarean section in Mississippi was 18%, but 80% in California (Miller and Leader, 1992). In one series there was an 80% repeat caesarean section rate in private patients and 50% in-patient from a public ward in the same institution (Greenhill, 1961). It is believed that fear of litigation for unfavourable outcome rather than a scientific evidence based approach has been largely responsible for this extreme disparity. In trying to rationalize this disparity, practitioners

worldwide embraced such selection method as X-ray pelvimetry where and whenever conditions allowed. Up to 1959 most literature still held X-ray pelvimetry as a useful investigation in determining the presence of cephalopelvic disproportion, more so in patients with a previous caesarean section (Steer, 1958). This resulted in the making routine of X-ray pelvimetry, at least in primigravidas (Mengert et al, 1948). The review of pelvimetry has, however, almost always not shown a correlation between the results of pelvimetry and outcome of labour (Barton,1982). Acceptable success in vaginal delivery rate without increasing the incidence of symptomatic rupture of uterus or resulting in a worse perinatal mortality have also been reported in Africa (Munjanja, 1987). In Jordan 69% of women who had a previous caesarean section for cephalopelvic disproportion (CPD) managed to deliver vaginally in a setting where repeat caesarean section accounted for 13.4% of all caesarean sections (Heija, 1995). Wound dehiscence was only 0.11% while there was no maternal or perinatal loss attributable to uterine rupture. Though in Heija's study the primary diagnosis of cephalopelvic disproportion may have been in question, it shows that careful examination of the primary indication for caesarean section may lower the repeat caesarean section rate and hence lowering of the overall caesarean section rate.

In Jamaica where the population is predominantly of African descent, the primary caesarean section rate was reported as 4.1%, of which repeat caesarean section accounted for 1.3% (i.e. over a third of all caesarean sections) (Webster et al, 1992). In parts of Africa, e.g. Zaire, where the caesarean section rate is low, repeat caesarean sections accounted for 49% (Onsrud, 1996), meaning almost half of all caesarean section were for previous caesarean

section. Uterine rupture of 0.2% was reported but the maternal and perinatal outcome was not worse than in the general obstetric practice.

At UTH the previously mentioned unpublished studies regarding the outcome of trial of labour for scar (by Wadhawan in 1979 and Benema in 1993) put the contribution of repeat caesarean section at 37% and 20% respectively. Uterine rupture occurred in 0.15% of all patients undergoing trial of labour for scar. However there were no reported maternal mortalities.

While the central question in many studies regarding parturition in women with previous caesarean section has been the safety of vaginal delivery in terms of maternal and perinatal mortality and morbidity (Flann, 1984), the view that even a planned caesarean section is not free of risks has led to careful review of growing trends of high repeat caesarean section incidences (Evrand and Gold, 1977). Data from prospective cohort studies between 1982 and 1988 indicate an overall vaginal delivery rate of 54.7% in all women with previous caesarean sections and 79.9% in those actually allowed to have a trial of labour for scar (Paul et al, 1985). The maternal morbidity in terms of febrile disease, blood transfusion requirements, endometritis, wound infection, thromboembolic phenomena and anaesthetic complications have been comparatively less in those delivered vaginally. Maternal mortality related to repeat caesarean section is debatable because even if it is higher in the repeat elective caesarean section group, the indications necessitating caesarean section could be responsible for some deaths (Evrand and Gold, 1977).

Uterine rupture can be a life threatening emergency. However, despite the increase in caesarean sections, uterine rupture has remained low in modern obstetrics and serious sequelae even rarer (Fedorkow et al, 1987). Though previous caesarean section is often considered to be the most common cause of uterine rupture, in Fedorkov's series it was involved in less than half the cases. The probability of requiring an emergency caesarean section for reasons other than the risk of uterine rupture (e.g. acute fetal distress, cord prolapse antepartum haemorrhage) is much higher. In one series in which a uterine rupture rate of 0.22% was recorded, other indications for emergency repeat caesarean section were 30 times higher than caesarean section because of a risk of uterine rupture (Cohen et al, 1985). Cohen et al suggested that fear of uterine rupture should not hinder trial of labour for scar in any obstetric department that encounters and is prepared to look after other emergency conditions.

From the above reports, the cautious interpretation has been that a trial of labour for caesarean scar is not associated with greater risk of death for either the infant or the mother. Many authorities now recommend trial of labour for scar in selected cases of previous caesarean sections. A history of classical low vertical, hysterotomy or unknown uterine incision remains, however, a contraindication to trial of labour.

OBJECTIVES

The overall objective of this study was to systematically establish the outcome of trial of labour for scar at UTH in women who had one previous caesarean section, and to assess reasons that may have influenced the outcome.

Specific objectives

To establish:

1. The repeat caesarean section rate at UTH.
2. The success rate of trial of labour for scar.
3. The indications for repeat caesarean section.
4. Whether the indications for primary caesarean section affected the outcome of trial of labour for scar.
5. The incidence of uterine rupture in trial of labour for scar.

METHODS

In the 12 months period from 1st October 1995 to 30th September 1996, a prospective study of all patients who had one previous caesarean section was conducted at the University Teaching Hospital in Lusaka. On entering the unit, all those who had a previous caesarean were flagged to monitor what happened to them subsequently. Scrutiny was made of the antenatal cards, various log books in the labour ward and that in the operating theatre. Where the medical information was vague, the patient herself was asked to clarify. Data collection was facilitated by a checklist (see Appendix). During the study period the records of 352 women who had one previous caesarean section were scrutinised.

The following data were compiled :

Part A. Antenatal

Age

Parity

Indications for previous caesarean section.

Whether or not patient had a vaginal delivery after the primary caesarean section.

Whether the patient had been seen antenatally at the University Teaching Hospital.

The reasons for admitting the patient.

Part B. Outcome of those with one previous caesarean section, with the following scenarios:

1. Vaginal delivery - Those who had achieved a vaginal delivery spontaneously or by vacuum and forceps delivery.
2. Elective caesarean section - Those in whom a planned caesarean section was performed for a specific indication e.g. they may have had a transverse lie, breech presentation strong patient preference etc.
3. Emergency Caesarean Section - Those in whom the trial of labour for scar was abandoned, after diagnosis of true labour, due to indications that required expedient delivery e.g. fetal distress or antepartum haemorrhage.
4. Intrapartum caesarean section - This group of women with a previous caesarean section, represented “failed trial of labour”. In this group labour was prolonged and the action line reached during the trial of labour. In all these cases including those who delivered vaginally, labour was not allowed to exceed 12 hours.

Caesarean section referred to in this study is the lower segment caesarean section unless otherwise specified.

All the information was analysed using Epi-Info version 6. Analysis was both descriptive and comparative. Comparative analysis included the Student’s t-test and the chi-square test, both with their ‘p’ values. A ‘p’ value of <0.05 was considered significant. The 2 x 2 contingency tables also allowed calculation of the odds ratio (OR) and the 95% confidence intervals (95% CI).

RESULTS

Mode of delivery of all UTH deliveries, 1st October 1995 – 30th September 1996

In the one year study period, there were a total of 12,185 deliveries. Vaginal deliveries accounted for 10,664 (87.5% of the total deliveries) while 1521 (12.5%) were caesarean deliveries. A total of 352 women had one previous caesarean section of whom 204 (58.0%) achieved a vaginal delivery while 148 (42%) needed repeat caesarean section (see Table I).

Table I.

Mode of all deliveries at UTH, 1st October 1995 – 30th September 1996 (n=12,185)

Mode	Number	Percentage
Vaginal deliveries (without previous C/S)	10460	85.8
Vaginal deliveries (after one previous C/S)	204*	1.7
Caesarean sections (other than one previous C/S)	1373	11.3
Caesarean sections (after one previous C/S)	148*	1.2
Total	12185	100

* Note : study patients were those with one previous caesarean (C/S), n=352. These include vaginal deliveries (after one previous caesarean section, n= 204) and repeat caesarean section (after one previous caesarean section, n=148).

Mode of delivery of 352 subjects with one previous caesarean

The mode of delivery of the 352 women with one previous caesarean section is presented in Table II. Two hundred and four (204) out of the 352 (58%) achieved a vaginal delivery as spontaneous vaginal delivery (SVD) or by instrumental delivery. The other 148 (42%) had a repeat caesarean section.

Table II. Mode of delivery after one previous caesarean section (n=352)

Mode	Number	Percentage
SVD	202	56.8
Instrumental	2	0.3
Caesarean Section	148	42.0
Total	352	100

Nature of caesarean in subjects with a repeat caesarean

Out of the 352 women, 148 had to have a repeat caesarean section for various reasons. 61 of these 148 had failed to progress to vaginal delivery in the prescribed time on the partogramme (intrapartum caesarean for failed trial of labour) and had a repeat caesarean section (see Table III). The others were either emergency (30) or elective (57) as defined in the Methods Section.

**Table III. Vaginal deliveries after one previous caesarean
and nature of repeat caesarean sections (n=352)**

Mode	Number	Percentage
Vaginal delivery	204	58.0
Intrapartum caesarean sections	61	17.3
Elective caesarean section	57	16.2
Emergency caesarean section	30	8.5
Total	352	100

Trial of labour for scar in subjects with one previous caesarean.

Out of 352 women with one previous caesarean section, 265 had a trial of labour. Of the remaining 87, 57 had an elective caesarean section (e.g. for twins or transverse lie at term) while the other 30 had an emergency caesarean section (e.g for fetal distress) requiring expedient delivery without continuing a trial of labour. Table IV below shows the mode of delivery of the 265 women who were allowed a trial of labour. The majority, 204 out of 265 (76.9%) managed a vaginal delivery after trial of labour.

Table IV. Mode of delivery after trial of labour for scar (n=265)

Mode	Number	Percentage
Vaginal delivery	204	76.9
Intrapartum caesarean section	61	23.1
Total	265	100

Parity

Parity in the study group of 352 who had a previous caesarean ranged from 1 to 10. Mean parity was three. Table V shows the separate parities versus outcome in terms of vaginal delivery and caesarean section in the index pregnancy.

Table V. Parity versus mode of delivery among the 352 subjects with one previous caesarean section (separate parities)

Parity	Vaginal delivery	Caesarean section	Total (vaginal or (C/S)	% vaginal delivery
1	86	48	134	65.2
2	41	22	63	65.1
3	32	38	70	45.7
4	19	9	28	67.9
5	7	16	23	30.4
6	11	5	16	68.8
7	5	5	10	50
8	2	3	5	40
9	0	2	2	0
10	1	0	1	100
Total	204	148	352	58

Primiparity and multiparity

Table VI below presents the data regarding the parity of the 352 subjects (primipara or multiparas - more than para 1) and whether this affected mode of delivery. The odds ratio and 95% confidence intervals do not illustrate any effect of parity on mode of delivery. As illustrated in the contingency table, multiparas have less chance of progressing to a caesarean than primiparas (although this was not statistically significant, $p=0.06$).

Table VI. Parity versus mode of delivery in the 352 women with one previous caesarean section (primipara or multipara)

Parity	Caesarean section	Vaginal delivery
Primipara (para 1)	100	118
Multipara (more than para 1)	48	86
Total	148	204

OR=0.66 (95% CI, 0.41<OR<1.05) (X^2 3.44, $p=0.06$)

Effect of grandmultiparity

The subjects were subsequently stratified in two groups of para 1 to 4 and para 5 to 10 (parity of 5 or more being the working definition of grandmultiparity). The mode of delivery in these two groups is presented in Table VII. This study illustrates that grandmultiparas have a higher chance of undergoing a caesarean section after having had a previous caesarean section.

Table VII. Effect of grandmultiparity on mode of delivery (n=352)

Parity	Casearean section	Vaginal delivery	Totals N (%)
Grandmultipara (para 5 to 9)	31	26	57 (16)
para 1 to 4	117	178	295 (84)
Total (%)	148 (42)	204 (58)	352 (100)

OR=1.81 (95% CI , 0.99<OR<3.34) ($X^2 = 4.25$, p= 0.04)

Parity and uterine rupture

There were 3 cases of ruptured uterus in the 352 subjects with one previous caesarean section :

A gravida 2, para 1, who during trial of labour at term, had antepartum haemorrhage was clinically diagnosed to have a ruptured uterus. On laparotomy patient found to have a scar dehiscence. A liveborn 3.22kg baby was delivered in good condition. The uterus was repaired.

A para 5 had postpartum haemorrhage after a stillbirth at 1.66kg (32 weeks gestation). At laparotomy she was found to have a fundal rupture of the uterus. A hysterectomy was performed and the patients condition was stable.

A gravida 7, para 6 had her second delivery by caesarean section. The patient was admitted at term in prolonged first stage from a local clinic. She had taken traditional medicines believed to have oxytocic properties. At laparotomy a uterine rupture was discovered and repaired. The baby was a fresh stillborn of weight 3.16 kg.

The risk of grandmultiparity to rupture of uterus is presented in Table VIII below. It is noteworthy 2 out of the 3 cases of ruptured uterus occurred in grandmultiparous patients

Table VIII. Risk of grandmultiparity on rupture of uterus (n=352)

Parity	Rupture	No rupture
Para 5 to 9	2	55
Para 1 to 4	1	294
Total	3	349

OR = 10.69 (95% CI, 0.54<OR<632) (X^2 5.68, p= 0.017)

Age

The age range of subjects was 16 to 55 years. Mean age was 26 years. Table IX shows the stratified age of patients versus mode of delivery. Further analysis was deferred to that of parity which had been previously presented

Table IX. Age versus mode of delivery in 352 subjects with one previous caesarean

Age (years)	Vaginal delivery	Caesarean section	Total (vaginal or (C/S)	% vaginal delivery
16 to 19	13	11	24	54.2
20 to 24	72	36	108	66.7
25 to 29	54	44	98	55.1
30 to 34	38	28	66	57.6
35 to 39	24	24	48	50
>40	3	5	8	37.5
Total	204	148	352	58

Birthweight

Six of the babies in the series of 352 were not weighed (2 who were delivered by repeat caesarean section and 4 who achieved a vaginal delivery). The mean birthweight of the remaining 348 babies who were weighed was 3.020 kg. The mean birthweight of the 146 subjects who had a repeat caesarean section was 3.060 kg, while for the 200 who achieved a vaginal delivery, the mean birthweight was 3.030 kg (non-significant on Student t-test). Of the only 2 babies with birthweight greater than 4.0kg; one was of 4.6 kg delivered by caesarean section and one of 4.1kg delivered vaginally. In Table Xa are presented the results of the mode of delivery in those babies greater than mean birthweight (> 3.020 kg) and those less than mean birthweight (< 3.020 kg). These figures include those women who had an elective caesarean section and were not given a trial of labour. As the Odds ratios shows, birthweight did not appear to influence outcome although there was a trend towards vaginal delivery with lighter babies.

Table Xa. Number of lighter and heavier than mean birthweight (3.020 kgs) versus mode of delivery (all patients regardless of trial of labour – n=352).

Birthweight	Caesarean section	Vaginal delivery	Totals
<3.020kg	70	99	169
>3.020kg	76	101	177
Not weighed	2	4	6
Totals	148	204	352*

OR = 0.94 (95% CI, 0.60<OR<1.48) (X² 0.08, p= 0.77)

* 3 cases with rupture of uterus (cases presented previously; 3.22kg liveborn of a primipara; 1.66 kg stillborn of a para 5; 3.16 kg of a para 6):

Birthweights of babies delivered after trial of labour

For the 265 patients who had a trial of labour after a previous caesarean section, the mean birthweight for the group who achieved a vaginal delivery (n=204, but 4 not weighed) was 3.030 kg. However for the group who had to have a repeat caesarean section (n=61) the mean birthweight was 3.100 kg. Although mean showed heavier babies for those women who had required to be delivered by caesarean section again (3.1 vs 3.03 kg) this was not statistically significant (on Student's t- test, p=0.2).

Table Xb. Number of lighter and heavier than mean birthweight (3.020 kgs) versus mode of delivery (n=265 all who had a trial of labour)

Birthweight	Caesarean section	Vaginal delivery	Totals
<3.020kg	33	99	132
>3.020kg	28	101	129
Not weighed	0	4	4
Totals	61	204	265

OR = 0.89 (95% CI, 0.50<OR<1.58) (X² 0.19, p= 0.66)

History of vaginal delivery.

Of the 352 women who had one previous caesarean section, 214 women had no history of having subsequently delivered after the primary caesarean section, while 138 had one or more subsequent vaginal deliveries. The modes of delivery in these two groups are illustrated in Table XI. Previous vaginal delivery after a caesarean was associated with a greater chance of achieving a vaginal delivery after one previous caesarean section - see Odds Ratio below.

Table XI. History of previous vaginal delivery after caesarean section versus mode of delivery (n = 352)

	This delivery		
History	Caesarean section	Delivered Vaginally	Totals
No previous vaginal delivery	104	110	214
Previous vaginal delivery	44	94	138
Totals	148	204	352

OR=2.02 (95% CI, 1.26<OR<3.24) ($X^2 = 9.62$, $p=0.002$).

History of previous vaginal delivery in those undergoing trial of labour

Of the 265 women who had a trial of labour, Table XII shows the breakdown of the number who had a previous vaginal delivery related to mode of delivery in the current pregnancy. Previous vaginal delivery after a caesarean was associated with a greater chance of achieving a subsequent vaginal delivery - see Odds Ratio below.

Table XII. History of previous vaginal delivery versus mode of delivery in subjects with a trial of labour (n=265)

	This delivery		
History	Caesarean Section n (%)	Vaginal Delivery n (%)	Totals N (%)
No previous vaginal delivery	50	110	160 (60.4)
Previous vaginal delivery	11	94	105 (39.6)
Totals (%)	61 (23)	204 (67)	265 (100)

OR=3.88 (95% CI, 1.83<OR<8.42) (X²= 15.44, p = 0.001)

Antenatal booking and mode of delivery in all 352 subjects

Of the 352 subjects, 275 (78.1%) had been booked at UTH antenatal clinics. The other 77 (21.9%) had not booked at UTH (but may have booked at local clinics who had not referred on to UTH antenatally). Their outcome in terms of mode of delivery is illustrated in Table XIII. Results show that booking at UTH had no bearing on the mode of delivery.

OR= 1.19 (95 % CI, 0.7<OR<2.05) ($X^2 = 0.47$, $p = 0.40$)

Table XIII. UTH antenatal booking versus mode of delivery (n=352)

Booking	Caesarean section	Vaginal delivery	Totals (%)
Not booked at UTH	35	42	77 (21.9)
Booked at UTH	113	162	275 (78.1)
Totals (%)	148 (42)	204 (58)	352 (100)

OR= 1.19 (95 % CI, 0.7<OR<2.05) ($X^2 = 0.47$, $p = 0.40$)

Antenatal booking and mode of delivery in 265 subjects allowed a trial of labour

Even for those who were allowed a trial of labour, there was no difference in outcome between UTH Booked and those who were not booked with respect to mode of delivery.
(see below)

Table XIV. Booking versus mode of delivery in subjects allowed trial of labour
(n=265)

Booking	Caesarean section	Vaginal delivery	Totals (%)
Not booked at UTH	12	42	54
Booked at UTH	49	162	211
Totals (%)	61 (23%)	204 (67%)	265 (100)

OR= 0.94 (95% CI, 0.43<OR<2.03) ($X^2 = 0.02$, $p = 0.87$)

Antenatal booking and rupture of uterus (265 subjects allowed a trial of labour)

With respect to rupture of uterus, the booking at UTH had relevance. It was noteworthy that two of the three subjects who had rupture of the uterus had not booked at UTH (Table XV below). Although the odds ratio suggests that not having booked at UTH is strongly related to risk of ruptured uterus, the 95% confidence intervals is below unity (0.79) as well as being well above unity (84.59).

Table XV. UTH booking versus ruptured uterus (N= 265)

Booking	Ruptured uterus n (%)	No rupture n (%)	Totals (%) N (%)
Not booked at UTH	2	52	54 (21.9)
Booked at UTH	1	210	211 (78.1)
Totals (%)	3 (1)	262 (98.9)	265 (100)

OR= 7.81 (95 % CI, 0.72<OR<84.59) ($X^2 = 3.99$, p = 0.045)

Indication for repeat caesarean section.

A caesarean section was repeated in 148 of the 352 patients for different reasons. These were :- elective indications in which a planned repeat caesarean section was performed; emergency indications in which a caesarean section had to be done even if the patient was selected for trial of labour. If she was already having a trial of labour, the emergency condition was responsible for abandoning the trial. Intrapartum caesarean sections represent the failed trial of labour for scar. These subjects had been in labour for more than the prescribed time as monitored by the partogramme (i.e. having reached the action line). The reason for failing to progress to full dilatation and delivery was the indication for a repeat caesarean section.

Table XVI. Indications for repeat caesarean section in subjects with one previous caesarean section (n=148)

Indication	Emergency	Elective	Intrapartum	Total (%)
CPD	0	4	15	19 (12.8)
Poor uterine contractions	1	2	23	26 (17.6)
Grandmultipara	0	12	0	12 (8.1)
Big Breech	0	9	2	11 (7.4)
Pre-eclampsia and Eclampsia	2	8	7	17 (11.5)
Fetal Distress	13	0	0	13 (8.6)
Impending Rupture	1	0	1	2 (1.4)
Transverse Lie	2	5	0	7 (4.6)
Malposition	0	0	6	6 (4.1)
Ruptured Uterus	3	0	0	3 (2.0)
Placenta Praevia	2	1	0	3 (2.0)
Secondary Arrest	0	0	4	4 (2.7)
APH	2	0	0	2 (1.4)
Elderly	1	3	0	4 (2.7)
BOH	1	2	0	3 (2.0)
Cord Prolapse	2	0	0	2 (1.4)
PROM	0	5	1	6 (4.1)
Twins	0	5	0	5 (3.4)
Macrosomia	0	1	2	3 (2.0)
Total	30	57	61	148 (100)

Indication of previous caesarean and mode of delivery in current pregnancy

Each indication for the primary caesarean section (at previous caesarean) was recorded according to the mode of delivery in this index pregnancy. The results are tabulated in Table XVII. Note that 57% of subjects previously delivered by caesarean for cephalopelvic disproportion had a successful vaginal delivery subsequently. Among those whose reasons for the primary caesarean section were unknown, 56% delivered vaginally.

Table XVII. Recorded indication for primary caesarean section versus mode of delivery (n=352)

		Outcome This Pregnancy	
Previous caesarean's indication	Number N (100%)	Caesarean section n (%)	Vaginal delivery n (%)
CPD	67(100)	29(43)	38(57)
Fetal distress	47(100)	21(45)	26(55)
Grandmultiparity	1(100)	1(100)	0
Pre-eclampsia / Eclampsia	63(100)	24(38)	39(62)
Big breech	29(100)	14(49)	15(51)
Cord prolapse	23(100)	3(13)	20(87)
Macrosomia	6(100)	5(83)	1(17)
Malposition and secondary arrest	19(100)	9(47)	10(53)
Unknown indication	48(100)	21(44)	27(56)
Transverse	7(100)	2(29)	5(71)
APH and placenta praevia	20(100)	6(30)	14(70)
Twins	9(100)	3(33)	6(67)
History of ruptured uterus	3(100)	3(100)	0(0)
PROM	5(100)	3(60)	2(40)
Dystocia	5(100)	4(80)	1(20)
Total	352	148	204

DISCUSSION

Vaginal delivery after previous caesarean

The overall vaginal delivery rate of the 352 women with one previous caesarean section was 57.9% (204 out of 352) (Table II and III). Taking into account that 265 out of the 352 were actually allowed trial of labour for scar, and that 204 delivered vaginally, the actual vaginal delivery rate was 79% (Table IV). These figures are consistent with Paul's analysis of prospective cohort studies between 1982 and 1985 in which comparable figures of 54% and 79.9% respectively are cited (Paul et al 1985).

With respect to the indication for the primary caesarean section versus mode of delivery of the current trial of labour for scar, 38 out of 67 subjects (57%, Table XVII) who had previously had a caesarean section for cephalopelvic disproportion delivered vaginally this time. This finding of a successful high vaginal delivery rate after previous caesarean for presumed cephalopelvic disproportion is in agreement with the Jordanian experience (Heija, 1995) in which 69% of patients with previous caesarean section for cephalopelvic disproportion patients managed to deliver vaginally. Other researchers have concluded that even in a woman with a previous caesarean section where there was radiological evidence of cephalopelvic disproportion, this may not be grounds for denying trial of labour for scar in a subsequent pregnancy (Thubisi et al, 1993).

Repeat Caesarean Section

Out of 352 women, 148 (42%) had a repeat caesarean section (Table II) for various reasons (Table XVI). However, only 265 of the 352 women had a trial of labour for scar, of which 61 (23%) were subsequently delivered after an intrapartum caesarean section. Of these 61, 19 subjects had a repeat caesarean with the indication given as cephalopelvic disproportion, while poor uterine contractions accounted for 23 subjects (Table XVI). This indication was not recorded in studies undertaken elsewhere. At UTH, augmentation of labour using syntocinon in cases of previous caesarean section is very rarely practiced. It was also for this reason that 80% (4 out of 5 subjects) of cases of premature rupture of membranes had a repeat caesarean section rather than be induced or augmented (Table XVIII). McGarry (1969) had shown no contraindication to use of syntocinon in previous caesarean section. The use of syntocinon may have increased the vaginal delivery rate but at the possible expense of ruptured uterus.

History of vaginal delivery after the primary caesarean section

In this series of 352 subjects, there were 214 who had not had a subsequent vaginal delivery after the caesarean section, whereas 138 had achieved a vaginal delivery before this index pregnancy. Of the 138 women, 94 managed to deliver vaginally this time while 44 delivered by caesarean section (Table XI). Therefore a vaginal delivery after a previous caesarean confers a greater chance of achieving a vaginal delivery in the index pregnancy. Using this same analysis for the 265 who had a trial of labour (see Table XII) the results showed that a previous vaginal delivery conferred an even better chance of achieving another vaginal

delivery this time (OR=3.88, 95% CI 1.83<OR<8.42 p = 0.001). This finding is consistent with other studies (Paul et al, 1985; Bedoya et al, 1992).

Parity

Higher parity (previous 5 to 10 deliveries) was associated with a higher rate of caesarean section than lower parities (Table VII, $X^2 = 1.33$ p=0.04). Table VIII shows that uterine rupture was associated with parity. The tendency not to perform a repeat caesarean section for grandmultiparity ought to be reconsidered. The fact that a history of a previous vaginal delivery was predictive of a vaginal delivery contradicts the finding that higher parity was more associated with caesarean section. It should, however, be noted that statistical significance was only reached when analysing parity exceeding para four. This may be due to the fact that a high parity coupled with a previous caesarean section may make it more likely that a patient would not be given a chance of a trial of labour irrespective of whether or not the primary caesarean section was followed by a number of vaginal deliveries. The fact that 46% (Table VII) of grand multiparas delivered vaginally in a setting where grandmultiparity is an indication for a repeat caesarean section shows a lack of policy on this matter. Grandmultiparas should be carefully managed and more judicious use should be made of caesarean delivery.

Birthweight

Of the 265 babies whose mothers had a trial of labour, 204 delivered vaginally, while 61 were delivered by caesarean. The mean birthweights in the two groups were 3.03kg

and 3.100kg respectively. It seems to suggest that heavier babies were more at risk of being delivered by caesarean in a subject undergoing a trial of labour. However, this was not statistically significant in this series ($p=.08$, Students t-test).

Birthweight was not associated with risk of uterine rupture. One rupture of the uterus occurred in a patient who had a baby that weighed 1.66kg, another weighed 3.16kg and the third weighed 3.16kg. The heaviest baby delivered vaginally in this series was 4.1kg. A bigger randomized cohort study of estimated birthweight and outcome of trial of labour for scar would be needed to provide more information.

Booking at UTH

Not having booked at UTH for antenatal care (or not even having been referred to the UTH clinic from local clinics) was not associated with a higher caesarean section {OR= 0.94 (95% CI, $0.43 < OR < 2.03$) ($X^2 = 0.02$, $p = 0.87$) (Table XV)}. However it is noteworthy that all cases of ruptured uterus in this series occurred in the unbooked women who had a previous caesarean section. The implications of this are clear and a referral policy has to be in place to ensure women are referred appropriately.

Uterine Rupture.

In the study period, there were three cases of uterine rupture in subjects with one previous caesarean section. It is noteworthy that two had not previously booked at UTH.

Use of oxytocin infusion

Most of the studies referred to in the Literature Review had a limited use of oxytocin in women undergoing trial of labour for scar. This was not so in this study where oxytocin was not used. As previously mentioned a few more vaginal deliveries could have been achieved but at a potentially higher risk of rupture of the uterus. With the poor availability of blood at UTH it was prudent to be more cautious and not allow trial of labour with oxytocin for augmentation, except in selected cases.

CONCLUSION

Based on the large percentage of women who delivered after a previous caesarean section, and the maternal morbidity that can occur with repeat caesarean section, trial of labour after previous caesarean section is a reasonable option at UTH. This takes into account the small risk of uterine rupture. This risk can be minimised by ensuring antenatal booking at the appropriate hospital and judicious selection of who to allow a trial of labour. Unless there is obvious cephalopelvic disproportion, patients with previous caesarean section for cephalopelvic disproportion could selectively have a trial of labour in the subsequent pregnancy. Where the reason for primary caesarean section is not known and in the absence of other contraindications, a trial of labour for scar can be undertaken.

RECOMENDATIONS

Women in Lusaka with one previous caesarean section should be booked for delivery at UTH. Health workers at primary health care clinics must ensure that women with a previous caesarean section are referred to UTH (or another district hospital if elsewhere) where a trial of labour for scar or elective caesarean delivery would be undertaken after careful review of the previous indications and in consultation with the patient.

Twenty eight percent of the subjects in Lusaka had unknown reasons for the primary caesarean section. Caregivers must provide their patients with full details of the previous delivery, particularly when it is a caesarean section – this would help with the decision to proceed with trial of labour or not.

A continuous audit of delivery outcome after previous caesarean should be instituted at UTH to monitor trends. Other hospitals in the country should be encouraged to set up an audit to review outcome after previous caesarean section - it is believed such a critical audit may decrease the total numbers of caesarean sections performed.

APPENDIX

Outcome of labour after previous caesarean section

Data capture form

Age:.....

Parity:.....

Gravidity:.....

Booked or unbooked:.....

Number of vaginal deliveries after previous caesarean section:.....

Indication for previous caesarean section:.....

Other Diagnosis on Admission:.....

Elective caesarean section (Indication):.....

Emergency caesarean section (Indication).....

Trial of labour for scar (outcome) :

Vaginal delivery

Vacuum or Forceps (indication).....

Intrapartum caesarean section (Indication).....

Apgar score of baby,

1 minutes.....5 minutes.....

Birthweight

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