OUTCOME OF A TERM PREGNANCY WITH PREVIOUS CAESAREAN SECTION

A Thesis Submitted in Partial Fulfillment of the
Requirement for the Degree of Doctor of Medicine
(Obstetrics & Gynaecology) in
Tribhuwan University

October, 1998 A. D. Asoj, 2055 B.S.

BY:
DR. ANJANA KARKI
M.B.B.S. (PAKISTAN)

Based on the Study Conducted at the Maternity Hospital, Thapathali

ABBREVIATIONS

ADL	-	Arrest disorders of labour
ANC	-	Antenatal check up
APH	-	Antepartum hemorrhage
ARM	-	Artificial rupture of membranes
CPD	-	Cephalopelvic disproportion
CS	-	Caesarean section
DOA	-	Date of Admission
DOD	-	Date of discharge
EI	-	Elective
Em	-	Emergency
EDD	-	Expected date of delivery
FD	-	Feotal distress
FTP	-	Failure to progress
IOL	-	Induction of labour
Inst. Del	-	Instrumental delivery (Forceps/vacuum)
LMP	-	Last menstrual period
LSCS	-	Lower segment caesarean section
MRI	-	Magnetic resonance imaging
NPOL	-	Non Progress of Labour
NND	-	Neonatal death
PROM	-	Prelabour rupture of membranes
PPH	-	Post-Partum hemorrhage
PG	-	Prostaglandins
RPOC	-	Retained products of conception

SB	-	Still birth
SVD	-	Spontaneous vaginal delivery
SCBU	-	Special care baby unit
TOA	-	Time of Admission
TOL	-	Trial of labour
VBAC	-	Vaginal birth after caesarean section

TABLE OF CONTENTS

LIST OF CHARTS, TABLES AND APPENDICES

List of Charts

List of Tables

TABLE OF CONTENTS

LIST OF CHARTS, TABLES AND APPENDICES

List of Charts

List of Tables

List of Appendices

INTRODUCTION AND STUDY BACKGROUND

1. INTRODUCTION AND STUDY BACKGROUND

The desire for a normal and healthy baby, an easy labour and normal delivery of every expecting mother and the attending obstetrician is understandable. In Nepal, majority of the deliveries take place at home, usually unattended or at the most, attended by unskilled or semi-skilled persons. Most of these deliveries are normal, the baby is healthy and puerperium uneventful. In hospitals and referral centres see only those few cases which get complicated during the process and come for the help of skilled obstetricians are seen. The rest of the uneventful and the tragic ones in which either the mother or the baby is lost remain unreported and hence unnoticed. However, this scenario is changing , though at a gradual pace. More women are visiting the hospitals for antenatal check-ups and for safer delivery. The attending obstetrician is no more a passive observer with a wait and watch policy but is actively involved and ready to intervene in the interest of the mother and the baby. This means that many a times delivery is not a natural one but assisted, instrumental or even operative.

Caesarean section (CS) is defined as delivery of the feotus through the incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy) (1). One of the most dramatic features of the modern obstetriCS is the relentless increase in the CS rate in developed countries. In USA, the rate of caesarean delivery has increased from 4.5 percent in 1965 to almost 25 percent in 1998 and thereafter has plateaued or decreased slightly, with the rate in 1995 being 21.8 percent (1). Even in Dublin, in Coombe Women's' Hospital, the CS rate is rising, with 7.6 percent in 1979 and 12.6 percent in 1994 (2). In Thapathali's Maternity Hospital, Thapathali, CS rate was 9 percent in 2051 B.S. (1994-1995), 10 percent in 2052 B.S. (1995-1996), 11.3 percent in 2053 B.S. (1996-1997) and 11.14 percent in 2054 B.S. (1997-1998).

Women are now opting for higher education, professional careers, late marriage and a smaller family size. Hence, every pregnancy today is more precious than ever before.

Due to the rise in CS rate, today we obstetricians encounter more women with a previous caesarean delivery. A patient with a previous Caesarean delivery is at high risk and poses a challenging problem to the obstetrician. E.B. Craigins dictum of "Once a Caesarean section, always a Caesarean section' has now been modified into "Once a Caesarean section, always a hospital delivery". Yet repeat elective CS accounts for a significant contribution to the rising incidence in CS rate. Repeat CS accounts for 35 percent of CS in USA, 23 percent in Norway and 8 percent in Hungary (3). For reasons involving the patients and physician choice, the rate of caesarean delivery after previous CS is high despite the fact that mortality rate of CS is between five to ten times higher than that of vaginal delivery (4)

The trend for repeat elective CS is also changing. The term trial of labour (TOL) though initially used in cases of suspected cephalopelvic disposition (CPD) is now used also for patients with previous CS, though many use the term trial of scar in these cases. It is not just the scar that is being tested but the whole process of labour is assessed in patients with previous caesarean delivery. Trial of labour (TOL) and vaginal birth after Caesarean (VBAC) have now been introduced and accepted in many countries. People are more aware and informed and many expecting mothers wish to experience natural labour and delivery and obstetricians are also more inclined for natural birth with minimum necessary help. When obstetricians come across patients with previous Caesarean delivery, they have to care for them during pregnancy and plan their mode of delivery. The basic question arises whether they need to be delivered by the operative route again or TOL can be allowed. Many studies have reported the safety of TOL in these patients. Controversy continues over when to advise which patient to undergo TOL. The potential is present to reduce the CS rate by 30 percent if all patients without a recurring indication for CS are delivered vaginally (5). Most of the published series show that nearly two thirds of all patients undergoing TOL will successfully deliver vaginally but efforts to predict who will succeed are not always accurate. The safety of both the mother and the baby remains of prime importance. The prerequisite for allowing TOL has to be

identified and fulfilled before the obstetrician can analyze the results. If the obstetrician can decide when to give a TOL beforehand, we can make arrangements accordingly. In US, American College of Obstetrician and Gynaecologists (ACOG) has a defined protocol for the management of patients with previous CS. Many centres have statistics regarding CS rate, previous CS population, TOL rate and VBAC rates of their institutes.

It is time that Thapathali's Maternity Hospital, also update these issues so that the situation can be compared with the other centres. The safety and success rates in women with one previous CS may influence the management of those women with two or more caesarean deliveries in the past. In the set up at Thapathali's Maternity Hospital these women with two or more previous CS are delivered routinely by repeat elective CS. The maternal and foetal outcome of these pregnancies with one previous CS may guide the obstetrician to plan their actions. It is best to keep the primary CS rate low so that the question of repeat CS does not arise. When the primary procedure has already been done, at least the repeat procedure can be performed only when absolutely required. The problem of high and rising CS rate will have to be attacked on two fronts, firstly by reducing the primary section rate and secondly by attacking the repeat section incidence. George Bernard Shaw in the preface of his play 'The Doctor's Dilemma' wrote, "when an operation is once performed, nobody can ever prove that it was unnecessary". The question for today's obstetrician is "when a repeat CS is once performed, can anybody ever prove that it was unnecessary?"

identified and fulfilled before the obstetrician can analyze the results. If the obstetrician can decide when to give a TOL beforehand, we can make arrangements accordingly. In US, American College of Obstetrician and Gynaecologists (ACOG) has a defined protocol for the management of patients with previous CS. Many centres have statistics regarding CS rate, previous CS population, TOL rate and VBAC rates of their institutes.

It is time that Thapathali's Maternity Hospital, also update these issues so that the situation can be compared with the other centres. The safety and success rates in women with one previous CS may influence the management of those women with two or more caesarean deliveries in the past. In the set up at Thapathali's Maternity Hospital these women with two or more previous CS are delivered routinely by repeat elective CS. The maternal and foetal outcome of these pregnancies with one previous CS may guide the obstetrician to plan their actions. It is best to keep the primary CS rate low so that the question of repeat CS does not arise. When the primary procedure has already been done, at least the repeat procedure can be performed only when absolutely required. The problem of high and rising CS rate will have to be attacked on two fronts, firstly by reducing the primary section rate and secondly by attacking the repeat section incidence. George Bernard Shaw in the preface of his play 'The Doctor's Dilemma' wrote, "when an operation is once performed, nobody can ever prove that it was unnecessary". The question for today's obstetrician is "when a repeat CS is once performed, can anybody ever prove that it was unnecessary?"

LITERATURE REVIEW

2. LITERATURE REVIEW

2.1 Caesarean Section as a Mode of Delivery

The term "Caesarean" for abdominal delivery of a child by cutting through the abdominal wall and the uterus was perhaps derived from "Lex regia" which later became known as " Lex Caesarica" (Caesar's law). This law ordered that dead or dying women should have abdominal delivery to preserve the child for the state (3.6). Towards the end of eighteenth century, it was performed in recently dead or moribound women to extract and save the baby. In the nineteenth century, it was done on the living with a reasonable chance for the women's survival The first recorded CS on a living women was done in 1,500 AD, performed by a person of Swiss nationality, Jacob Nufer on his wife. In UK, the first recorded CS on a living woman was performed in Edinburgh by Robert Smith in 1737 (3).

Kaufman has described eight CS performed in Edinburgh between 1737 and 1820 mainly for gross pelvic contraction caused by osteomalacia. In all those cases, the mothers died within 48 hours and the child survived in only 2 cases. Frayer has described in detail two CS done in two Muslim women for severe osteomalacia in Lucknow, India both with longitudinal uterine incision. Porros (1876) performed CS with better results as the uterus was removed during the operation. In 1882 Max Sanger in Leipzig advocated the suturing of the uterus after delivering the child. The transperitoneal lower segment operation with a vertical incision was initially advocated by Kronig (1912) and later Munro Kerr established the low transverse incision in England that has been accepted since 1940 at the 12th British Congress of Obstetrics and Gyanecology and now has universal acceptance

(3). Caesarean section is considered to be a simple and a safe operation and is being employed with increasing frequency on the assumption that it will improve the outcome for both the mother and the baby. There is considerable morbidity associated with CS apart from the condition that mandated operative delivery. Risks of general anesthesia, blood transfusion requirements, infection, use of intravenous fluids and prolonged hospital stay, longer recovery period and the cost are significant factors to be considered (7). The indication for CS has been very liberalized from the severely contracted pelvis of the ancient times to varied maternal and foetal indications today. With safer anaesthesia, blood transfusion facilities and broad spectrum antibiotics and CS being a very safe operation, the incidence of CS is rising all over the world. With an increase in the rate of primary CS more pregnant women with previous caesarean deliveries are encountered in obstetric practice today.

2.2 Vaginal Birth After Previous Section

E.B. Craigin's dictum " Once a caesarean always a caesarean" published in 1910 was in an era of classical caesarean section (2). Since then, anaesthesia, blood transfusion facilities and antibiotiCS have improved and a classical CS is rarely performed today. Today the concept of VBAC is well accepted and the Craigin's dictum has been modified into " Once a caesarean always hospital delivery". The reported incidence of successful vaginal birth in-patients with previous CS ranges from 27 percent to 98 percent. The success rate of vaginal delivery is usually calculated as a percentage of these undergoing TOL. IF those undergoing repeat elective CS are also included and percentage of vaginal delivery calculated from this total, the success rater of VBAC may be slightly lower. Patients undergoing trial of vaginal birth after previous CS ranges from 14 percent to 84 percent. All patients who are considered eligible for trial of vaginal birth do not undergo TOL. In one study, 89 percent of patients with previous CS were considered eligible for

TOL but only 64 percent accepted to undergo TOL and 36 percent refused (8). Patients with more than one previous caesarean delivery have a higher rate of refusal to undergo TOL even when they are considered eligible by their attending obstetricians (8)

Aurora et al in a prospective analysis of 700 cases reported a high rate of repeat elective CS of 59.43 percent, 13.5 percent emergency intrapartum CS and a low 27 percent vaginal delivery rate (9). Paterson and Saunders in an analysis of 1,059 cases have reported 37 percent elective CS, and 63 percent TOL with 79 percent vaginal delivery rate in the TOL group (10). Singh et al has analyzed 120 cases of which 65.84 percent had vaginal delivery (11).

VBAC rate may be different for recurrent and non-recurrent indications for the previous CS. Miller et al report a success rate of 68 percent in those with previous CS for CPD/FTP (8). In a prospective analysis done by Yasumizu et al, 45 patients with Arrest Disorders of Labour (ADL) were studied at term pregnancy of which 28 patients underwent TOL and 75 percent were successfully delivered vaginally (12). The highest rate of vaginal delivery has been reported after previous CS for breech presentation with cephalic presentation in the current pregnancy (8,9,13).

2.3 Factors Associated with Successful Vaginal Delivery

Different factors associated with the present and previous pregnancy have been analyzed by many studies to see if there are any factors that can be used to reliably predict the success or failure of TOL in patients with previous CS. Factors like single or multiple feotus presentation, gestational age, onset of labour, spontaneous or induced, indication for previous CS, previous labour and

puerperial events, history of vaginal delivery before or after the CS etc have been analyzed.

Higher rate of vaginal delivery in preterm pregnancies is reported, obviously because of smaller feotal size (14). Most studies done include only singleton feotus with cephalic presentation (13,15) but Flamm et al have found external cephalic version near term in patients with previous one or more CS to be safe and effective (16). Spontaneous onset of labour is found to be associated with a higher rate of VBAC in TOL group (9, 13,15). Thomas and Khan found 81 percent versus 61.5 percent vaginal delivery rate in spontaneous and induced labours respectively, while Rosemary Lovell found a low 45 percent vaginal delivery rate for induced labours in post dated pregnancies (13,17). Wasti et al has found no statistically significant difference between a spontaneous onset labour and induced labour and mode of delivery (18).

Established labour with more than 3 cm cervical dilatation and engagement of foetal head on admission to the labour ward has been reported to be associated with a higher chance of vaginal delivery (9,18). Flamm et al devised an admission scoring system including age, previous vaginal delivery, indication for the previous CS, cervical dilatation and effacement at admission and found that increasing scores were associated linearly with increasing probability of VBAC (19). Many studies have found that the success of TOL was not influenced by current infant's birth weight (12,15,20), while other studies have found the success of TOL to be favourably influenced by a smaller baby in the present pregnancy (10, 13,17). Chua and Arulkumaran in their review of a case controlled study stated that there was no significant difference in maternal and perinatal morbidity for women who underwent TOL and delivered infants more than 4 kg compared to those who delivered infants less than 4 kg (21).

History of vaginal delivery before or after the caesarean delivery is found to be favourable factor for successful TOL in many studies (9,10,11,22,23). Singh et al found 83.33 percent versus 58.33 percent, while Kore et al found 63.3 percent versus 39.1 percent rate of vaginal delivery in those with or without previous vaginal delivery respectively (11,14). Wasti et al in a retrospective analysis of 419 patients given TOL found no statistically significant difference in the outcome of TOL in relation to the presence or absence of previous vaginal delivery (15).

Another important factor is the indication for the previous CS with highest success rate of vaginal delivery being reported after previous CS for non-recurrent indications. Highest success rates in the range of 60-100 percent have been reported for previous CS for breech presentation and Foetal Distress (FD) (15,17,20,24). Some obstetricians regard CPD and FTP as a recurrent indication, while others regard them as non-recurrent indications. Previous indication of CPD and FTP/ADL has been found to be associated with a lower chance of vaginal delivery in the current pregnancy as compared to previous CS for other indications. Chua and Arulkumaran have found no statistically significant difference in the mode of delivery after previous CS for CPD and FTP and other indications (21). Abu-Heija in a prospective study of 135 patients with previous CS found a high rate of vaginal delivery of 69 percent in patients who had previous CS for CPD, whereas the rate of vaginal delivery in patients with previous CS for breech presentation, it was 77 percent (25). X-ray pelvimetry done to exclude fetopelvic proportion has been found to have very little value in the management of TOL in patients with previous CS (17,21). Foetal size estimation done in relation to gestational age, patient size, feotal head size, sonographic estimation of feotal weight and clinical experience may be more useful (12,17,21). CPD in the present pregnancy has been found to be a major cause of repeat elective CS and failed TOL (15,17,20). But in a prospective study, Miller and Leeder found no significant difference in the rate of vaginal delivery in

relation to the indication for previous CS (20). Paterson and Saunders found that maternal height was significantly taller in women who achieved vaginal delivery after TOL than those who required emergency CS (10), while Rosemary Lovell found no significant difference in the height of those who achieved VBAC and those who failed a TOL (17).

Previous labour and puerperial events have been found not to have influence in deciding for or against a TOL in the present pregnancy (18,21). Type of previous uterine incision has a major influence on the mode of delivery in the subsequent pregnancies. Most studies allow TOL in patients with previous low transverse uterine incision. Studies on patients with low vertical uterine incisions are very limited but studies have showed that patients with such incisions can undergo TOL safely (26). Most studies exclude patients with classical CS, previous uterine incision extending to the corpus and inverted T incisions. Unknown type of uterine incision due to lack of previous documents does not exclude a patient from a TOL because most of them are low transverse ones (15,17). Augmentation of labour in patients with previous unknown uterine incision was found to be associated with increased incidence of scar separation but not increased caesarean delivery in a study done by Grubb et al (27).

Another major factor in deciding the mode of delivery in patients with previous CS is patient preference (21,24,28). About 40-50 percent patients eligible for a TOL opt to undergo elective CS (21). Concept of VBAC, prenatal counselling, patient acceptance and request for elective CS as a mode of delivery and factors like the desire to experience natural birth, memories of previous labour and post operative pain etc. may influence the acceptance or refusal of a TOL (28,29,30). Medicolegal pressures, institutes policy success rates for VBAC, obstetrician's skill, experience training and bias for previous CS patients management may influence the decision to advise for or against a TOL. Social reasons like

scheduled time of delivery, availability of obstetrician and supporting hospital team may be the reasons for elective CS or induction of labour in these patients (24,30,31,32).

2.4 Outcome after more than one Caesarean Section in the Past

TOL in women with more than one caesarean delivery in the past remains controversial. The question whether scar rupture is influenced by the number of previous caesarean scar remains unanswered. Donald's (1974) modified Craigin's dictum of " Twice caesarean always a caesarean" has been modified by many studies into "Twice a caesarean, always a hospital; delivery" (33). The American College of Obstetrician and Gynaecologists (ACOG) has also not given clear guideline regarding TOL in patients with more than one CS (34). In a survey by questionnaire, 97% of consultants in UK advocated a TOL after one previous CS while only 5 percent of the consultants were for TOL after 2 previous CS (35).

Asakura and Myers found VBAC less successful in women with more than one CS in the past but no increase in the incidence of scar rupture or dehiscence. The incidence of placenta accreta was higher in patients with previous multiple CS (34). Phelan et al did not find any lowered incidence of vaginal delivery in patients with previous two and three CS (9). Chua and Arulkumaran have reported use of prostaglandin induction and oxytocin augmentation in patients with previous two CS during TOL. They found higher incidence of caesarean hysterectomy in the elective CS group, done for intractable PPH due to uterine atony and placenta accreta (21). Flamm et al found 69% VBAC in TOL group in patients with more than one previous CS with no significant difference in the incidence of uterine rupture compared to patients with previous one CS (5). Granovsky et al has reported 73 percent VBAC in TOL group with no case of uterine rupture or perinatal loss. The maternal morbidity was lower in TOL group

than those undergoing elective CS in this series (36). Raana N. Jamelle has reported that even unplanned vaginal deliveries in patients with previous 2 CS where major part of labour occurred outside the hospital i.e. unsupervised TOL, to be relatively safe (35). All of those studies have stressed on continuous and intensive feotomaternal monitoring during labour, preferably with use of internal tocodynamic monitoring. The common practice of offering sterilization after two or three CS has been questioned by Tamele-Sali and Iskander. They state that the main cause of uterine rupture in patients with previous multiple CS is labour and hence, if delivery by elective CS can be planned for future, the women does not need to be stopped from having more children if she wishes to (37).

2.5 Induction and Augmentation of Labour in Patients with Previous Caesarean Section

There is usually a reluctance to induce or augment patients with a scarred uterus because of the fear of uterine scar rupture or dehiscence despite many reports of safety of the use of oxytocin and prostaglandins (PG) in these patients. Induction of labour (IOL) can be done by PG vaginal/intracervical gels artificial rupture of membranes (ARM) and intravenous oxytocin infusion as in patients without previous caesarean delivery. The role of induction in these patients is controversial with divergent views in literature. The Canadian Consensus Conference found insignificant data in literature to allow comment on induction of labour after a CS.

Use of prostaglandiuns (PG) in patients with previous caesarean scar is controversial and full frank discussion with the patient is obligatory before its use. In the Liverpool series of Rosemary Lovell PGE_2 gel was used for IOL in 11 patients of which 10 delivered vaginally without any complications (17). Behrens et al have also found intracervical PGE_2 gel for induction in patients with unripe

cervix to be safe and effective (23). Thomas and Khan had induction in 11 percent patients with PGE_2 gel, oxytocin infusion and ARM and found a higher rate of emergency CS in induction group as compared to those with spontaneous labour but no increased incidence of scar rupture or dehiscence (13). Taylor et al found no difference in induction to delivery interval or mode of delivery between use of vaginal PGE_2 and intravenous oxytocin but they have suggested an enhanced possibility of scar rupture in cases where PGE_2 use is followed by oxytocin augmentation (38). The incidence of scar rupture is reported to be similar for spontaneous onset labour and PG induced labour in the order of 0.3 to 1.2 percent (38,39).

At one time oxytocin stimulation of dysfunctional labour after a previous CS was strictly forbidden but now many studies have demonstrated that judicious use of oxytocin in titration with uterine contractions with adequate fetomaternal monitoring is both safe and effective (21,26,40). Arulkumaran et al were able to demonstrate that patients with previous CS were able to tolerate oxytocin induced contraction which were 15 to 25 percent stronger than those of women with caesarean scar who were in normal non augmented labours (26). Michael J. Turner has reported that use of oxytocin for augmentation of labour may be associated with increased risk of scar rupture, especially when labour is induced (2). Asaad and Alaily have reported an increased incidence of emergency CS when oxytocin is used for IOL when prelabour rupture of membrane occurs (41).

Many studies have found no difference in the rate of vaginal delivery with or without the use of oxytocin in labour. Paterson and Saunders found similar rates of vaginal delivery between spontaneous onset and induced labours (10). Other studies have found higher rate of vaginal delivery without increased incidence of complications when oxytocin was used (12,15,24). Some studies have found a lower chance of vaginal delivery when oxytocin was used (18,42). Nirmala Tated

found a higher rate of vaginal delivery in patients without use of oxytocin and patients with previous CS for CPD were less likely to deliver vaginally after oxytocin use. She also found more intraoperative complications like hemorrhage and uterine atony in patients who had received oxytocin (42). Arulkumaran et al found that those patients who had emergency CS for FTP after oxytocin use had a greater feotal mean birth weight than those who had vaginal delivery (33).

The decision to use oxytocin in those patients should be made by a senior and skilled obstetrician after exclusion of CPD and when NPOL has been diagnosed to be due to insufficient uterine contractions (21,33). Intensive fetomaternal monitoring in the form of external or internal tocodynamic monitoring, especially intrauterine pressure catheter use has been recommended by some. The rate of progress of labour during the first 3-4 hours after augmentation appears to indicate the likely outcome and should help in the decision whether to continue oxytocin (17,30,32,33). Scar rupture has been reported with prolonged infusion of oxytocin for more than 6 hours despite poor progress of labour (21,33).

2.6 Maternal Complications

The most feared complication and the one that makes obstetricians hesitate to give a TOL in patients with previous CS is uterine scar rupture. Scar rupture has been defined as a defect that involves the entire thickness of the uterine wall including the visceral peritoneum. Scar dehiscence is the defect in the uterine wall in which the visceral peritoneum overlying the previous scar is intact . The overall incidence of scar rupture reported in literature is very low, ranging from 0.3 to 1.2 percent. The incidence of uterine rupture following previous classical scar is two to ten times more as compared to previous lower segment transverse scar (21). Dewhurst reports the incidence of scar rupture in previous lower segment transverse scars as 0.5 percent overall, 0.8 percent in those in labour and 1.2 percent in those having vaginal delivery (4).

The bloodless scar dehiscence is the most common form of loss of integrity of the scar which is usually asymtomatic and often diagnosed during elective or emergency CS for other indications or manual exploration of the lower segment after vaginal delivery. Routine exploration of the lower segment after vaginal delivery is recommended in some centres to check the integrity of the scar (9,14,15). However, in some centres, it is not done unless the patient is sympomatic with tachycardia, hypotension or continuous vaginal bleeding and these symptoms usually warrant a laparotomy (17,18,21). Foetal distress, especially acute and prolonged bradycardia or prolonged and variable deceleration of the foetal heart pattern is regarded as one of the earliest signs of scar rupture or dehiscence (44,45). The clinical sign of scar rupture like scar tenderness, bleeding per vagina, maternal hypotension and tachycardia and upward displacement of foetal head following engagement in earlier part of labour, are usually late manifestations. These signs develop only after significant blood has seeped into the myometrium (13,46,47).

Chua and Arulkumaran report that out of 20 cases with previous CS who had emergency CS for scar tenderness, only one had scar rupture (21), while Kore et al report that out of 61 patients diagnosed having scar tenderness, only 5 had scar dehiscence (14). Uterine scar rupture can occur with relatively mild uterine activity in the latent phase, can be asymptomatic and may not preclude normal cervical dilatation and feotal descent and even elective CS may not prevent these scar ruptures and dehiscences (48). The chances of scar ruptures may be higher in the late first and second stage which may justify the old practice of prophylactic forceps or vacuum delivery in patients with previous CS (21,47). External cephalic version in patients with previous CS has been found to be safe and effective and can increase the rate of vaginal delivery following successful versions (16,49). Oxytocin used during labour in patients with previous CS may

increase the incidence of scar rupture and dehiscence during a TOL (46,47,48). One study found maternal mortality of only 1 percent, while foetal mortality was very high, 50 to 75 percent if the feotus was extruded out of the uterus into abdominal cavity (46). One of the rare complications reported is of uterovesicular rupture (46). The number of previous CS that increases the risk of rupture uterus is not known. The rate has been reported to be three times higher in patients with two or more CS as compared to patients with previous one CS (46). Prenatal prediction of the integrity of a scar during a subsequent TOL by transabdominal or transvaginal sonogram or magnetic resonance imaging (MRI) has not been found to be very useful (21,22). B.M. Petrikovsky examined previous CS scar endoscopically during labour after rupture of feotal membranes and found usefulness in identifying previous vertical scars in patients who did not have previous medical documents (50).

When compared to vaginal delivery, both elective and intrapartum emergency CS are found to be associated with significantly higher maternal morbidity. The postnatal hospital stay is significantly more in those patients. The incidence of post partum fever defined as a temperature of more than 38^0 C on two occasions 24 hours apart, is more in patients delivered by CS, whether elective or emergency (29,51). Soltan and Adelusi have reported a higher incidence of febrile morbidity in patients delivered by emergency CS as compared to those undergoing elective CS (52). The incidence of wound infection, PPH, thromboembolic events etc. are higher after a repeat CS (13,17). Some studies have found these complications more in patients delivered by emergency CS after a failed TOL than after an elective CS (13,44). However, Rosemary Lovell a higher incidence of PPH after vaginal delivery has reported in those patients (17). Certain catastrophic complications like massive hemorrhage emergency hysterectomy, major artery ligation, rupture uterus etc. are reported to be associated with previous CS (53,54). The incidence of placenta previa and

placenta accreta is reported to be significantly higher after previous CS and the incidence rises linearly with the number of previous CS (54,55,56).

The maternal mortality reported with previous CS is very low, the major cause being PPH, rupture uterus and embolism. In developed countries, the maternal mortality due to CS is under one per thousand deliveries. In repeat CS, there is an increase in the risk of maternal mortality at least twice that of vaginal delivery (35).

2.7 Foetal Outcome

Most of the published series report a favourable foetal outcome in patients with previous CS. Perinatal morbidity and mortality is not usually influenced by the mode of delivery. In cases of antepartum intrauterine feotal death, congenital anomaly or preterm baby, the inclination is more towards a TOL and hence, apparently higher perinatal morbidity and mortality may be associated with vaginal delivery. There is no significant difference between the foetal outcome in emergency CS following a failed TOL and elective CS. Even in cases of feotal distress following rupture or dehiscence of scar, if recognized and managed immediately, the foetal outcome is good. A high perinatal mortality of 50-75 percent is reported in cases where the feotus is extruded into the abdominal cavity following uterine rupture (15,17,41).

In a multicentre collaborative study by Flamm et al, the incidence of infants with 5 minute Apgar score of less than 7 was 9/1000 after exclusion of congenital anomaly. The perinatal mortality in the study population was 6/1000, while it was 10/1000 for the overall hospital population (5). Rosemary Liverpool did not find any significant difference in the number of low Apgar scores in TOL and elective CS group. In her study, 36 percent of babies admitted to the special care nursery

after elective CS had transient respiratory distress, while none of the babies in the TOL group, whether emergency CS or VBAC developed this complication (17). However, Miller and Leeder have reported low Apgar scores and meconeum stained liquor to be significantly more in babies following vaginal delivery than elective CS but the incidence of admission to level three nursery and perinatal mortality not to be influenced by the mode of delivery (20). Kasumizu et al did not find any difference in low 5-minute Apgar score between VBAC or failed TOL (13). Thomas and Khan in their study of 876 patients had one neonatal death in 90 patients undergoing elective CS due to hydrocephalus and out of 786 patients undergoing TOL, there was no case of intrapartum feotal death. One neonatal death was due to hydrops (13). Kore et al had a perinatal mortality of 9 percent in the vaginal delivery and 4.4 percent in patients who had emergency CS after a failed TOL (14).

2.8 Prerequisites for Management of Patients with Previous Caesarean Section

The most important prerequisite in managing patients with previous CS is feto-maternal surveillance during pregnancy and labour. Preconception counselling of the patient and her partner, special prenatal classes to discuss subjects like repeat CS, TOL, VBAC induction etc are beneficial (14,18,21). It is very important to get informed consent before a TOL (14).

The institutional set up with skilled obstetrician, midwives, pediatrician, anaesthetists and operating room services available round the clock is necessary. During labour, continuous feotal heart rate tracing with cardio-tocograph or intermittent auscultation is essential. Some centres routinely use intrauterine pressure catheters, while some centres do not use them even when oxytocin is used. Stronge et al has recommended active management of labour according to

O'Driscoll policy as in patients without previous CS (18). Partograph to assess labour progress is very beneficial (13).

The role of X-ray pelvimetry in deciding the mode of delivery may have a limited place (13,14,15,18,57). The role of X-ray pelvimetry may be more important if the pelvis is found to be inadequate because then the patients may be delivered by elective CS but when TOL is given, the success or failure can not be reliably predicted by X-ray pelvimetry (57). The role of ultrosonogram may be in dating scans performed before 20 weeks of gestation, and in assessing feotal weight and for exclusion of feotal macrosomia (12,15). The role of epidural anaesthesia in women with previous CS for pain relief during labour remains unresolved. The fear of it masking the pain and tenderness of uterine rupture and interference with maternal response to hemorrhage in uterine rupture due to sympathetic blockade makes many hesitate to use it. Many studies have used epidural anaesthesia routinely or made available on request (15,17,20,33,46). Nguyen et al found a higher rate of vaginal delivery in the TOL group with the use of epidural anaesthesia (58). Other modes of analgesia used for pain relief during labour include hot packs nitrous-oxide, intravenous or intramuscular narcotics like pethidine.

OBJECTIVES

3. OBJECTIVES

3.1 General Objectives

To study the maternal and foetal outcome of a term pregnancy with one previous lower segment caesarean section (LSCS).

3.2 Specific Objectives

a. To find out the rate of vaginal delivery after the LSCS;
b. To analyze the indication for the repeat LSCS;
c. To study the maternal complications; and
d. To determine the foetal outcome including morbidity and mortality.

METHODOLOGY

4. METHODOLOGY

4.1 Study Design

The study carried out was of descriptive design with prospective follow up. This study was carried out in the Maternity Hospital (Shree Panch Indra Rajya Laxmi Prasuti Griha), Thapathali. The study period lasted for four months, from 1st Asoj 2054 to 29th Poush 2054 (17 September 1997 to 13 January 1998).

The patients enrolled in this study consisted of 2 groups, the study group and the comparison group. The study group consisted of women with previous one delivery by LSCS fulfilling 3 inclusion criteria as given below:

(i) Term pregnancy i.e., 37 to 42 completed weeks of gestation, calculated from the last menstrual period or by Ultrasonogram in early pregnancy.
(ii) Single live fetus
(iii) Cephalic presentation

The LSCS delivery may have been immediately prior to this pregnancy or there may have been an intervening vaginal delivery. 3 patients in the study group were not sure of their LMP and gestational age was confirmed by Ultrasonogram done before 20 weeks of pregnancy. In our hospital patients with previous CS usually do not have induction of labour. Patients fulfilling those criteria were enrolled in the study after their admission in the hospital for delivery. The patient was first seen in the emergency room (Admission room) where a detailed history was taken and full general, abdominal and vaginal examination was done to confirm that the patient fulfilled the criteria of the study group. This patient was then followed up during her stay in the hospital. All details regarding labour events, mode of delivery foetal outcome including SCBU admission, any

morbidity and mortality and maternal outcome with any complications during labour and puerperium during her hospital stay were noted. Before discharge from the hospital, a specially designed questionnaire was filled up to obtain all the necessary information for the study. During this study period of 4 months, a total of 106 patients fulfilling the criteria for the study group were collected.

For the comparison group, similar process was used. 3 parameters were used to enroll patients for this group.

(i) Same parity as the study group patients
(ii) Same age group as the study patient.
(iii) Only vaginal deliveries in the past

For the comparison group, the patient admitted after the study group patient, fulfilling the above 3 parameters with term pregnancy, single live foetus and cephalic presentation, was taken. Only patients with spontaneous onset of labour were included for the comparison group as none of the study group patients had induction of labour. These patients were followed up in the same manner as the study group. They were first seen in the emergency room where history was taken, examination done and followed up to see their labour events, mode of delivery foetal, and maternal outcome till discharge from the hospital. The same questionnaire was filled before discharge. Any patient discharged before delivery was dropped from the study and another patient, fulfilling the criteria for the comparison group was recruited. During this study period, a total of 106 patients were collected for the comparison group.

In those cases where the previous medical documents of study group patients were not available, information about the place of previous delivery was obtained. When the previous delivery had taken place in this hospital, the old hospital records were taken out from the date of delivery as all patients remembered the date of their last confinement. In

those cases where the previous delivery had taken place at home or another hospital, the relevant answer was marked unknown in the questionnaire.

Before the beginning of the study period i.e. from 21st Bhadra to 30th Bhadra 2054 (6 September - 15 September 1997) pretesting of the questionnaire was done for 1 week. Certain additions had to be done in the questionnaire such as previous foetal birth weight, number of hours in active labour in the hospital.

4.2 Data Entry and Analysis

The information obtained from the 2 groups were entered manually in a specially designed format. The dummy tables were then filled up and the data analyzed manually. At the end of first month, an interim analysis was done of the 22 cases collected. After all the data were collected, they were subjected to the statistical analyses. Statistical test done in this study is Z test with significance taken at 95 percent confidence interval with p value <0.5. The results obtained have been shown in tables, pie-charts etc. The discussion is done at the end in line with the available literature. The certain conclusions are drawn on the basis of these findings and recommendations duly made.

RESULTS

5. RESULTS

TABLE I
MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Model of Delivery	Study group		Comparison Group		p value
	No	(%)	No	(%)	
SVD	31	29.24	90	84.91	<0.01
Inst. del.	6	5.67	13	12.26	NS
Em LSCS	53	50.00	3	2.83	<0.01
El LSCS	16	15.09	0	0.00	<0.01
Total	**106**	**100**	**106**	**100.0**	

The total vaginal delivery in the study group = 31+6=37

∴ The rate of vaginal delivery in the study group = $^{37}/_{106}$= 34.90%

The total vaginal delivery in the comparison group = 90 + 13=103

∴ The rate vaginal delivery in the comparison group = $^{103}/_{106}$ = 97.16%

In the study group, 90 patients out of 106 underwent a TOL i.e. 84.90 percent. Out of these 90 patients, 37 delivered vaginally i.e. 41.11 percent. In patients with a history of previous one Caesarean delivery, i.e. the study group, the rate of vaginal delivery was 34.90 percent. In the comparison group, i.e., patients with previous vaginal deliveries only, the rate of vaginal delivery was 97.16 percent. This was statistically significant ($P< 0.01$).

The age of both the study and comparison group ranged from 18 yrs to 35 yrs.

The mean age of the study group = 25.77 yr. with a SD of ± 4.49 yrs

The mean age of comparison group = 25.39 yr with a SD of ± 4.39 yrs

TABLE II
MODE OF DELIVERY IN RELATION TO THE 3 AGE GROUPS IN THE STUDY AND COMPARISON GROUP

Age Group	Group (S)* / (C)**	Mode of Delivery					
		Vag. del.		Em. LSCS		El. LSCS	
		No	%	No	%	No	%
I. ≤ 19 yrs (6)	S	3	50.00	3	50.00	0	0.00
	C	6	100.00	0	0.00	0	0.00
II. 20-29 yrs (80)	S	29	36.25	40	50.00	11	13.75
	C	78	97.50	2	2.50	0	0.00
III. ≥ 30 yrs (20)	S	5	25.00	10	50.00	5	25.00
	C	19	95.00	1	5.00	0	0.00

(S)* -Study
(C)** - Comparison

In patients aged 19 yrs and less, vaginal delivery in the study group was 3 out of 6 and in the comparison group, it was 6 out of 6. In patients aged 20 to 29 yrs, vaginal delivery in the study group was 29 out of 80 and in the comparison group 78 out of 80. In patients aged 30 yrs and above, vaginal delivery in the study group was 5 out of 20 and in the comparison group, it was 19 out of 20. Hence, in all age groups, there was significantly higher rate of vaginal delivery in patients with no history of CS in the past i.e. the comparison group ($p<0.01$).

In the study group, in patients aged 19 yrs and less, an equal number had vaginal delivery and emergency CS. In patients aged 20 to 29 yrs and 30 yrs and above, there was a higher rate of repeat CS (emergency and elective CS) in both the age groups. This was statistically significant ($p<0.01$). Hence, in the study group, age did not have any influence in the mode of delivery.

Parity of the Study and Comparison Group

P_1 = 85 = 80.19%
P_2 = 14 = 13.21%
P_3 = 4 = 3.77%
P_4 = 3 = 2.83%

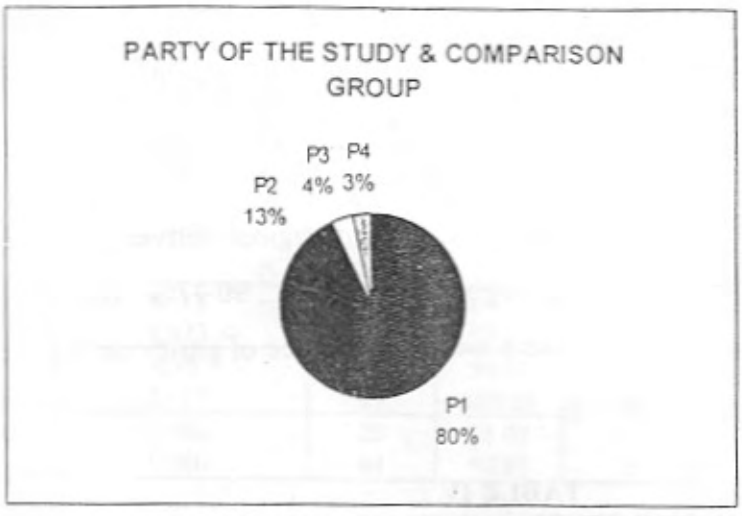


Chart 1. Parity of the Study and Comparison Group

Patients of Para 1, Para 2, Para 3 and Para 4 were taken in both the groups. In the study group among P_2, P_3 and P_4, 21 patients had immediate previous delivery by LSCS and 9 had immediately previous vaginal delivery with LSCS in the past. The parity of both the study and comparison group was strictly matched, with equal number of Para 1, (P_1), Para 2 (P_2), Para 3 (P_3) and Para 4 (P_4) in both groups.

TABLE III
RELATION OF PARITY WITH THE MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Parity	No	Group (S) / (C)	Mode of Delivery					
			Vag. del. No. (%)		Em. LSCS No. (%)		El. LSCS No. (%)	
			No	%	No	%	No	%
Para 1	85	S	27	31.76	46	54.12	12	14.12
		C	84	98.82	1	1.18	0	0.00
Para 2	14	S	6	42.86	5	35.71	3	21.43
		C	13	92.86	1	7.14	0	0.00
Para 3	4	S	2	50.00	1	25.00	1	25.00
		C	4	100.00	0	0.00	0	0.00
Para 4	3	S	2	66.67	1	33.33	0	0.00
		C	2	66.67	1	33.33	0	0.00

In the study group, among 85 patients with no history of vaginal delivery in the past, 27 P_1 patients had vaginal delivery i.e., 31.76%. Among 21 patients with history of vaginal

delivery i.e., (P_2, P_3 and P_4), 10 patients had vaginal delivery i.e., 47.61%. This difference was not statistically different. Hence, no influence of previous vaginal delivery on the mode of present delivery was found in the study group.

In the comparison group, among 85 P_1 patients, 84 had vaginal delivery i.e., 98.82%. Among 21 P_2, P_3 and P_4 patients, 19 had vaginal delivery i.e., 90.47%. This difference was not statistically significant. Hence, there was no influence of parity on the mode of present delivery in the comparison group.

TABLE IV
ANC VISITS IN THE STUDY AND COMPARISON GROUP

ANC Visits	Study Group		Comparison Group		p value
	No	(%)	No	(%)	
Nil	18	16.98	23	21.7	NS
Up to 2 Visits	6	5.66	17	16.04	<0.01
3-6 Visits	74	69.81	66	61.26	NS
7 and More Visits	8	7.55	0	0.00	<0.01
Total	106	100	106	100	

Even with a history of operative delivery in the past, 16.98% of the study group patients did not seek antenatal care, whereas in those with previous vaginal delivery 21.7% did not have antenatal check up. This difference was not statistically significant. In total, 22.64% in the study group and 38.68% in the comparison group had nil or inadequate antenatal check up (up to 2 visits).

The majority in the study group (77.36%) had satisfactory antenatal check up (3 and more visits) which is more than 61.26 % in the comparison group. This is statistically significant (p >0.02).

TABLE V
THE RELATION BETWEEN ANC VISITS AND THE MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

ANC Visits	Group No (S) / (C)	Mode of Delivery					
		Vaginal del.		Em LSCS		El LSCS	
		No	%	No	%	No	%
Nil	S=18	11	61.11	7	38.89	0	0.00
	C=23	22	95.65	1	4.35	0	0.00
1-2 Visits	S=6	3	50.00	3	50.00	0	0.00
	C=17	17	100.00	0	0.00	0	0.00
3 and more Visits	S=82	23	28.05	43	52.44	0	0.00
	C=66	64	96.97	2	3.03	16	19.51

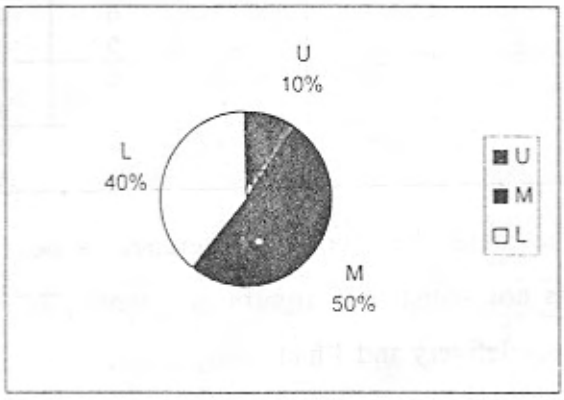
In the study group, among 18 patients with no antenatal check up, the difference in the rate of vaginal delivery and emergency CS was not statistically significant. Among 6 patients having 1 to 2 antenatal visits, 3 had vaginal delivery and 3 had emergency LSCS. All 16 patients who had elective CS in the study group had 3 or more antenatal visits. All these elective CS were decided before 37 completed weeks of gestation. Among 66 patients in the study group who had 3 or more antenatal check ups and allowed spontaneous labour, 23 had vaginal delivery (34.85%) and 43 had emergency CS (65.15%). The difference was statistically significant ($p<0.01$). Hence, higher percentage of patients in the study group having ANC care had repeat CS.

When comparing nil or inadequate ANC care (1 to 2 visits) in the study and comparison group, 39 out of 40 (97.5%) in the comparison had vaginal delivery as compared to 14 out of 24 (58.33%) in the study group. This difference was statistically significant ($p<0.01$).

Among patients with satisfactory ANC care i.e., 3 and more visits, 23 out of 66 allowed to undergo spontaneous labour had vaginal delivery (34.85%) in the study group as compared to 64 out of 66 (96.97%) having vaginal delivery in the comparison group. This was statistically significant ($p<0.01$). Hence, there was no influence of ANC in the comparison group.

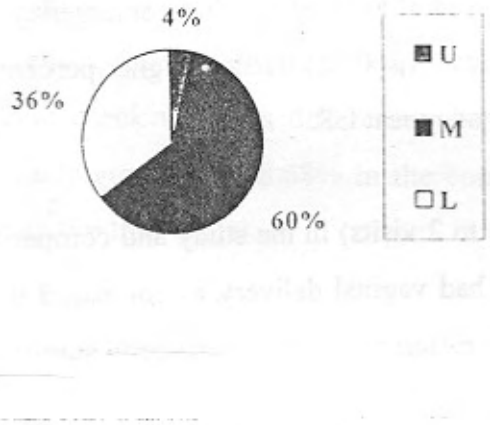
Socio-Economic Status

The data on socio-economic status regarding the study and comparison groups has been represented by the following charts:



U = Upper Class = 10 (9.43%)
M = Middle Class = 53 (50%)
L = Lower Class = 43 (40.57%)

Chart 2. Socio-economic Status Regarding Study Group



U = Upper Class = 4 (3.77%)
M = Middle Class = 63 (59.44%)
L = Lower Class = 39 (36.79%)

Chart 3. Socio-economic Status Regarding Comparison Group

There was no statistical difference in the percentage of women of three socio-economic classes in the study and the comparison group.

TABLE VI
MODE OF DELIVERY IN DIFFERENT SOCIO-ECONOMIC

TABLE VI
MODE OF DELIVERY IN DIFFERENT SOCIO-ECONOMIC CLASS OF THE STUDY AND COMPARISION GROUP

Socio-economic Class	Group No Study (S)/ Comparison (C)	Mode of Delivery					
		Vaginal del.		Em LSCS		El LSCS	
		No	%	No	%	No	%
Upper Class	S=10	2	20.00	5	50.00	3	30.00
	C=4	4	100.00	0	0.000	0	0.00
Middle Class	S=53	15	28.30	28	52.83	10	18.87
	C=63	62	98.41	1	1.59	0	0.00
Lower Class	S=43	20	46.51	20	46.51	3	6.98
	C=39	37	94.87	2	5.13	0	0.00

In all 3 socio-economic class, there was significantly higher rate of vaginal delivery in the comparison group than the study group ($p<0.01$). In the study group, the rate of vaginal delivery in the upper class was 2 out of 10 (20%) and in the lower class, it was 20 out of 43 (46.51%). This difference was statistically not significant. Hence, no significant difference in the rate of vaginal delivery was seen in relation to the socio-economic class of the study group.

TABLE VII
INDICATIONS FOR THE REPEAT LSCS

Emergency LSCS			Elective LSCS		
Indication	No.	%	Indication	No.	%
CPD	25	47.17	CPD	11	68.75
Scar tenderness	14	26.42	PAST EDD	3	18.75
FD	6	11.32	Others[1]	2	12.50
NPOL	5	9.43			
PROM	2	3.77			
Others[2]	1	1.89			
Total	53	100	Total	16	100

[1]. 1 case treated for secondary subfertility and 1 case with mild oligohydramnios and grade III placental calcification by USG

[2]. Mild PET (130/90, urine albumin (1+) and grade III placental calcification by USG

Emergency LSCS Group

The major indication for the repeat LSCS in this group was CPD 11 El and 25 EmCS. Out of the 25 cases with repeat emergency LSCS for CPD, 8 had previous LSCS for CPD. In 12, cases the previous indication was FD. In 5 cases, the previous indications were miscellaneous and included breech presentation, subfertility treatment, cord presentation, NPOL and obstructed labour.

The next major indication in this group was scar tenderness. In 13 out of 14 cases with the preoperative indication of scar tenderness, the uterine scar was found to be intact during operation but in 2 of these 13 cases, the lower uterine segment was thin and bulging. 11 cases were admitted in the latent phase of labour and diagnosis of scar tenderness was made during the latent phase. One patient was admitted in advanced active phase and a diagnosis of scar tenderness was made on admission and emergency LSCS performed immediately and there was partial dehiscence of the uterine scar. The foetal outcome in this case was of fresh SB which showed signs of intrapartum asphyxia and mother needed indwelling Foley's catheter for 48 hours. after surgery. One patient was not in labour on admission and a diagnosis of scar tenderness was made during the latent phase of labour but the scar was found to be intact intraoperatively. One patient was admitted in early active phase of labour and was observed for 3 hrs. 20 mins when the progress of labour was satisfactory but a diagnosis of scar tenderness was made and an emergency LSCS performed. The scar was found intact during the operation.

In the whole series of my study out of 106 study group patients, one silent scar dehiscence was diagnosed intraoperetively when emergency LSCS was performed for CPD. The patient was asymptomatic and needed no additional intraoperative procedures and postoperative period was also uneventful. The foetal outcome in this case was alive male 3.7 kg with Apgar score of 6 and 8 at 1 minute and 5 minutes respectively. Out of 37 vaginal deliveries in patients with previous CS, manual exploration of the lower

uterine segment was done in only 20 patients after delivery and thus, all cases of scar dehiscences may not have been detected.

The next frequent indication for the emergency LSCS was FD. In 2 out of 6 cases, the previous indication was also FD i.e. FD was recurrent. In 4 cases the previous indications were different.

The next indication in this group was NPOL. In 2 out of 5 cases, the previous indication was also NPOL.

In 2 cases emergency LSCS was done for PROM. Both patients were not in labour on admission and had pre-labour rupture of membranes in the hospital. Since in our hospital patients with previous caesarean delivery usually do not have induction of labour, both patients had emergency LSCS within 3 hours of admission.

Elective LSCS Group

11 out of 16 patients had elective LSCS for CPD diagnosed clinically. In 5 cases the previous indication was also CPD, in 3 cases the previous indication was FD and other 3 previous indications included failed IOL, previous 2 SB & NPOL due to hydrocephalus. None of these patients had preoperative X-ray pelvimetry.

3 patients had elective LSCS in this group because they were past EDD. 2 were at more than 41 weeks of pregnancy and one was at more than 40 weeks of pregnancy. This is because in our hospital patients with previous cesarean deliveries usually do not have induction of labour.

The major indication in the study group for repeat LSCS i.e. emergency and elective was CPD which was 36 out of 69 repeat LSCS in the study group, i.e. 52.17% of repeat LSCS

was for CPD. The difference in the rate of emergency CS 25 out of 53 i.e. 47.17% and 11 out of 16 i.e. 68.75 % in the elective CS was not statistically significant ($p<0.10$).

TABLE VIII

ANALYSIS OF VAGINAL DELIVERIES IN THE STUDY GROUP IN RELATION TO THE INDICATION FOR THE PREVIOUS LSCS

Indication	Total	No of vaginal del.	%
FD	33	11	33.33
Breech Pr	15	9	60.00
CPD	24	5	20.83
NPOL	11	2	18.18
APH	2	2	100.00
Others	21	8*	38.09
Total	106	37	

* Others having vaginal delivery-cord prolapse 2 and other one each previous NND & SB, severe PET, transverse lie, transverse lie of leading twin, transverse lie of 2nd twin with first delivered at home and unknown indication.

In 2 patients with previous CS for APH, both had vaginal delivery. Among 15 patients with previous CS for breech presentation with presently cephalic presentation, 9 had vaginal delivery, while in 33 patients with previous CS for FD, only 11 patients had vaginal delivery.

TABLE IX

STATUS OF LABOUR ON ADMISSION AND MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Labour Status	Group	No	Vaginal del.		Em. LSCS		El. LSCS	
			No	%	No	%	No	%
Not in Labour	Study :	19	0	0.00	4+	21.05	15	78.95
	Comparison:	0	0	0.00	0	0.00	0	0.00
Latent Phase	Study :	53	13	24.53	39	73.58	1++	1.89
	Comparison:	51	49	96.08	2	3.92	0	0.00
Early active Phase*	Study:	21	13	61.90	8	38.10	0	0.00
	Comparison:	55	54	98.18	1	1.82	0	0.00
Advanced Active Phase**	Study:	8	6	75.00	2	25.00	0	0.00
	Comparison:	0	0	0.00	0	0.00	0	0.00
Second Stage	Study:	5	5	100	0	0.00	0	0.00
	Comparison:	0	0	0	0	0.00	0	0.00

* Early active phase is taken as 3-4 cm. dilatation cervix in labour

** Advanced active phase is taken as more than 4 cm dilatation of cervix in labour

\+ These 4 patients were not in labour on admission and had emergency LSCS during the latent phase

++ This 1 patient had been planned for elective LSCS but was in latent phase on admission and had immediate LSCS.

In the study group, all 15 patients who were not in labour on admission had elective CS.

In the study group, among 53 patients who were in latent phase of labour on admission, 40 i.e. 75.47% had emergency CS and 13 i.e. 24.53% had vaginal delivery. This difference was statistically not significant.

In the study group among 21 patients who were in early active labour on admission 8 i.e. 38.10% had emergency CS and 13 i.e. 61.90% had vaginal delivery. This difference was statistically not significant.

In the study group among 8 patients in advanced active phase of labour 6 i.e. 75% had vaginal delivery and 2 i.e. 25% had emergency CS ($p<0.02$). Among 5 study patients who were in second stage of labour, all 5 had vaginal delivery, where major part of labour had occurred outside hospital, which can be regarded as unsupervised TOL.

Among patients of comparison group, 51 were in latent phase and 55 in early active phase. In the latent phase group, 49 out of 51 had vaginal delivery and in the early active phase group, 54 out of 55 had vaginal delivery. There was no difference in the mode of delivery in relation to the status of labour on admission, in the comparison group.

TABLE X
LABOUR AUGMENTATION AND MODE OF DELIVERY
IN THE STUDY AND COMPARISON GROUP

Method of Augmentation	Study Group*				Comparison Group			
	Vaginal (%) Delivery		Emergency LSCS (%)		Vaginal Delivery		Em LSCS (%)	
	No	%	No	%	No	%	No	%
None	23	21.69	47	44.34	34	32.08	2	1.81
ARM	14	13.21	6	5.66	23	21.69	0	0.00
OXYTOCIN	0	0.00	0	0.00	15	14.15	0	0.00
ARM+ OXYTOCIN	0	0.00	0	0.00	31	29.25	1	0.94
Total	37	34.90	53	50	103	97.17	3	2.83

*Among 106 study group, 16 patients (15.09%) had elective LSCS.

The only method for augmentation of labour in the study group was by ARM. In the comparison group, the methods of augmentation were both ARM and Oxytocin and both combined together.

In the study group, out of 90 patients in spontaneous labour, 20 were augmented and 14 had vaginal delivery (i.e. 70%) and 70 were not augmented and 23 (i.e. 32.86%) had vaginal delivery. The higher rate of vaginal delivery in the augmented group was statistically significant ($p<0.01$).

In the comparison group, out of 36 non augmented patients, 34 had vaginal delivery (94.44%) and out of 70 augmented patients 69 i.e. 98.57% had vaginal delivery. This difference was statistically not significant. In the augmented patients of two groups, there were 14 vaginal delivery out of 20 patients in the study group and 69 vaginal delivery out of 70 patients in the comparison group. This higher rate of vaginal delivery in the comparison group was statistically significant ($p<0.01$).

TABLE XI

INTERVAL BETWEEN ACTIVE LABOUR AND DELIVERY/INTERVENTION IN THE HOSPITAL IN THE STUDY AND COMPARISON GROUP

No of Hours (in active labour)	Study Group				Comparison Group			
	SVD	Inst. del	Em LSCS	El LSCS	SVD	Inst. del.	Em LSCS	El LSCS
0	0	0	40	16	0	0	0	0
Up to 1 hr	4	0	4	0	4	0	0	0
1-2 hrs	3	3	1	0	14	0	1	0
2-4 hrs	13	0	4	0	32	6	1	0
> 4hrs	11	3	4	0	40	7	1	0
Total	31	6	53	16	90	13	3	0

In the study group, among 90 patients allowed spontaneous labour 40 (44.44%) had emergency LSCS in the latent phase. These patients were not allowed to go into active labour. In the comparison group, among 106 patients in spontaneous labour, 47 (44.34%) were allowed more than 4 hours interval between the onset of active labour to delivery.

50 patients in the study group were allowed to go into active labour. 32 patients in the study group had up to 4 hours of active labour and 23 (71.87%) had vaginal delivery.

18 patients in the study group were allowed more than 4 hours of active labour and 14 (77.78%) had vaginal delivery and 4 (33.22%) had emergency CS. The higher rate of vaginal delivery in patients allowed more than 4 hours of active labour as compared to those allowed up to 4 hours of active labour was statistically not significant.

In the comparison group among 48 patients allowed more than 4 hours of active labour. 47 (97.92%0 had vaginal delivery and 1 (2.08%) had emergency CS.

TABLE XII

RELATION OF PRESENT AND PREVIOUS FOETAL BIRTH WEIGHT WITH MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Present and Previous Foetal Birth Weight	Study Group		Comparison Group	
	Repeat LSCS	Vaginal del.	Em LSCS	Vag del.
Equal or +/- 300 kg	31	14	0	40
Present baby larger by >300 gm	12	8	2	28
Present baby smaller by >300 gm	24	11	0	11
Previous foetal birth weight unknown	2	3+1*	1	24

* 1 patient in the study group had LSCS previously for twin pregnancy (2.4 & 2.1 kg).

In above table, the previous foetal birth weight taken in the study group is that of the one delivered by LSCS and in the comparison group is the one delivered immediately prior to this pregnancy. A margin of +/- 300 gms was taken because when ultrasonographic or clinical estimation of foetal birth weight is done, this is the usual margin used. The previous foetal birth weight was taken from the record and compared retrospectively with present birth weight after delivery.

In the study group among 45 patients with equal or + 300 gms foetal birth weight, 31 (68.89%) had repeat CS and 14 (31.11%) had vaginal delivery. The higher rate of repeat CS was statistically significant (P<0.01).

In the study group when the present foetal birth weight was larger (20 patients), 12 i.e. 60% had repeat CS and 8 (40%) had vaginal delivery. The higher rate of repeat CS was statistically not significant.

In the study group when the present foetal birth weight was smaller (35 patients), 24 i.e. 68.57% had repeat CS and 11 (31.43%) had vaginal delivery. The higher rate of repeat CS was statistically significant (p<0.01).

In 5 study patients when the previous foetal birth weight was not known and in 1 could not be compared because of previous twin delivery by CS, 2 had repeat CS and 4 had vaginal delivery. This difference was statistically not significant.

Hence, in the study group in 45 patients with present foetal birth weight almost equal to the previous one and in 35 patients with present smaller baby, the incidence of repeat CS was significantly more than vaginal delivery. In 20 patients with present larger baby and 6 patients in whom foetal weight could not be compared, the difference in the mode of delivery was statistically not significant.

When compared to the comparison group, the incidence of vaginal delivery, in present equal, larger and smaller foetal birth weight, there was significantly more vaginal delivery in the comparison group than the study group (p<0.01). When the previous foetal birth weight was not known in 6 patients in the study group and 25 patients in the comparison group, the difference in the incidence of vaginal delivery was not statistically significant between the two groups.

Overall in patients with previous CS, the incidence of repeat CS was more irrespective of the relation between present and previous foetal birth weight. When compared to patients with previous vaginal delivery, the incidence of repeat CS was significantly higher in the patients with previous caesarean delivery.

In 36 patients with CPD as the present indication for the repeat LSCS, the relation of the present and previous foetal birth weight was as follows:

Equal	=	13	(36.11%)
Present baby larger	=	7	(19.44%)
Present baby smaller	=	15	(41.67%)
Previous total birth weight unknown	=	1	(2.78%)

Among the 37 patients in the study group delivered vaginally, 5 patients had previous indication as CPD. Among these 5 patients, 3 had present baby of equal and 1 baby smaller than the previous birth weight and in 1 case, the previous total birth weight was unknown.

In this study, the information of previous foetal birth weight was not taken into account when deciding the mode of delivery.

TABLE XIII
MEAN HOSPITAL STAY IN THE STUDY AND COMPARISON GROUP IN RELATION TO THE MODE OF DELIVERY

Mode of Delivery	Study Group (Days)	Comparison Group (Days)
SVD	2.00	1.75
Inst. Del.	1.83	3.46
Em LSCS	8.18	7.00
El LSCS	8.18	0.00

The hospital stay was less in patients having vaginal delivery in both the study and comparison group.

TABLE XIV
MATERNAL OUTCOME IN RELATION TO THE MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Maternal Complications During Labour	Study Group			Comparison Group		
	Vag. del.	Em. LSCS	El. LSCS	Vag. del.	Em. LSCS	El. LSCS
No. Complications	35	45	15	94	2	0
Primary PPH	1	6	1	7	1	0
Others*	1	2	0	2	0	0

* Silent Scar dehiscince-1 diagnosed intraoperative
Scar dehiscence-1 diagnosed preoperative

*Third Degree Perineal tear-2

During Puerperium	Study Group			Comparision Group		
	Vag. del.	Em. LSCS	El. LSCS	Vag. del.	Em. LSCS	El. LSCS
No. Complications	35	40	11	101	1	0
Puerperal Pyrexia	1	12	5	0	2	0
Others**	1	1	0	2	0	0

** -See PPH following vacuum delivery needed readmission & exploration of uterine cavity -1
-Abdominal wound infection following Em LSCS -1

**-Episiotomy wound infection needed readmission & resuturing -1
- Exploration of uterine cavity for RPOC on 2nd postnatal day -1.

During labour in the study group, 2 out of 37 patients in the vaginal delivery group had complications and 9 out of 69 patients in the repeat CS group had complications. This difference was statistically not significant. In 53 patients undergoing emergency CS, 8 had complications and 1 out of 16 patients undergoing elective CS had complications. This difference was statistically not significant. In the comparison group, 9 out of 103 patients in the vaginal delivery group had complications and 1 out of 3 in the emergency CS had complications. This difference was statistically insignificant.

The complication rate during labour in the vaginal delivery group in the study group (2 out of 37) and the comparison group (9 out of 69) was statistically not significant.

During puerperium in the study group, 2 out of 37 in the vaginal delivery group and 18 out of 69 in the repeat CS group had some complications. The higher rate of puerperial complications in the repeat CS group was statistically significant ($p<0.01$). The

difference in the puerperial complications in the EmCS (13 out of 53) and EICS (5 out of 16) was statistically not significant.

In the comparison group, 2 out of 103 patients in the vaginal delivery group and 1 out of 3 patients in the emergency CS group had complications. This higher rate of puerperial complication in those undergoing emergencies CS in the comparison group was statistically significant ($p<0.02$).

In the puerperium, 2 patients of 37 having vaginal delivery in the study group and 2 patients out of 103 having vaginal delivery in the comparison group had complications. This difference was statistically not significant. Difference in puerperial complications in the study group patients undergoing repeat CS i.e. 18 out of 69 and in the comparison group undergoing emergency CS i.e. 2 out of 3, was statistically not significant. The significant complications during labour was primary PPH and during puerperium, it was puerperial pyrexia.

Primary PPH

Primary PPH has been defined in this study as blood loss of 500 ml or more during delivery and up to 24 hours of delivery. The main maternal complication in the study and comparison group during labour was primary PPH incidence being 7.55% in both groups. In the study group, 4 patients needed blood transfusion but in case of the comparison group, 3 patients needed it. In the study group, in 1 patient delivered vaginally had primary PPH due to cervical tear, which was repaired under anesthesia. Among 6 patients having primary PPH during Em LSCS in the study group, 3 had extension of uterine incision, 2 had atonic uterus and 1 had anterior low lying placenta. In 1 patient who had primary PPH during El LSCS in the study group, it was due to atonic uterus.

In the comparison group, primary PPH occurred in 6 patients delivered spontaneously, all due to atonic uterus and in 1 patient who was delivered by vacuum for prolonged second stage primary PPH was also due to atonic uterus. In one patient delivered by Em LSCS in the comparison group, primary PPH was also due to extension of uterine incision.

Puerperial Pyrexia

Puerperial Pyrexia has been defined in my study as occurrence of temperature of more than 38° C on two occasions 24 hours apart, after delivery. In the study group puerperial pyrexia was found in 18 patients (16.98%) and in the comparison group in 2 patients (1.89%). Among the study group, 1 patient who had spontaneous vaginal delivery developed puerperial pyrexia. She was admitted in early labour, ARM done for augmentation of labour and she delivered in 3 hr 22 minutes after admission. Her baby developed septicemia and was admitted in SCBU for 10 days and during this hospital stay, she developed puerperial pyrexia from 3rd day which was treated with antibiotiCS only.

Among those delivered by Em LSCS, 12 patients developed puerperial pyrexia. Among these 12 patients, 10 had Em LSCS in the latent phase, 1 had LSCS after 45 minutes in active labour when a diagnosis of CPD was made and 1 had Em LSCS after 7 hours active labour when a diagnosis of NPOL was made.

Among those undergoing El LSCS, 5 developed puerperial pyrexia.

In the comparison group, puerperial pyrexia was detected in only 2 patients delivered by Em LSCS, both for FD. 1 patient had Em LSCS after 2 hrs 15 minutes of active labour and the other after 1 hr 30 min of active labour.

Overall febrile morbidity in the post-operative period were of similar incidence in both Em and El LSCS.

The mean hospital stay in those delivered by repeat LSCS was 8.18 days during which period puerperial pyrexia could be detected, whereas for those delivered spontaneously it was 2 days and by instrumental delivery it was 1.83 days and puerperial pyrexia during this short hospital stay may not have been detected.

In the comparison group, the mean hospital stay was 1.75 days in spontaneous vaginal delivery, 3.46 days in instrumental delivery and 7 days in Em LSCS. Puerperial Pyrexia was detected only in 2 patients delivered by Em LSCS among the comparison group.

TABLE XV
FOETAL OUTCOME IN THE STUDY AND COMPARISON GROUP

Foetal Outcomes	Study Group			Comparison Group		
	Vag del.	Em LSCS	El LSCS	Vag del.	Em LSCS	El LSCS
Live Birth	37	52	16	102	3	0
Still Birth	0	1[x]	0	1[xx]	0	0
NND	0	0	0	0	0	0
SCBU	4	12	1	6	1	0
Male	18	26	8	59	1	0
Female	19	27	8	44	2	0
Low Birth Weight	12	7	2	9	11	0

[x] 1 fresh SB occurred in the study group- Em LSCS performed for scar tenderness detected on admission in advanced active labour. There was scar dehiscence and foetus showed sings of intrapartum asphyxia.
[xx] 1 fresh SB occurred in the comparison group- Vacuum delivery was performed for cord prolapse in second stage

TABLE XVI
FOETAL BIRTH WEIGHT IN THE STUDY AND COMPARISON GROUP

	Study Group			Comparison Group		
Birth weight (kg)	Vag del.	Em LSCS	El LSCS	Vag del.	Em LSCS	El LSCS
1.5 - 1.99	0	0	0	1	0	0
2.0 - 2.49	12	7	2	8	1	0
2.5- 2.99	12	21	8	38	1	0
3.0- 3.49	12	16	3	45	0	0
3.5- 3.99	1	9	3	10	1	0
≥4	0	0	0	1	0	0
Total	37	53	16	103	3	0

Mean birth weight in the study group : 2.92 kg

Mean birth weight in the comparison group : 3.03 kg

Mean birth in the study group

Vag del. - 2.78 kg

Em LSCS - 3.00 kg

El LSCS - 2.97 kg

Mean weight in the comparison group

Vag del. - 3.03 kg

Em LSCS - 2.92 kg

TABLE XVII
APGAR SCORE AT 1 MIN AND 5 MINS IN RELATION TO THE MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

No of Hours		Study Group			Comparison Group		
Apgar Score	Minute	Vag del.	Em LSCS	El LSCS	Vag. Del.	Em LSCS	El LSCS
0-3	1 min	0	4	0	2	0	0
	5 min	0	2	0	2	0	0
4-6	1 min	10	8	3	22	1	0
	5 min	3	1	0	4	1	0
7-10	1 min	27	41	13	79	2	0
	5 min	34	50	16	97	2	0

In the study group, patients with Apgar score less than 7 at 1 min in the vaginal delivery group was 10 out of 37 and in the repeat CS was 15 out of 69. This difference was statistically not significant. At 5 min, Apgar score less than 7 in the vaginal delivery group was 3 out of 37 and in the repeat CS, it was 3 out of 69. This difference was statistically not significant. In the comparison group, Apgar score less than 7 at 1 min was in 24 out of 103 vaginal delivery and 1 out of 3 emergency CS. The difference was statistically not significant. The difference in Apgar score less than 7 at 5 mins in 6 out of 103 vaginal deliveries and 1 out of 3 emergency CS in the comparison group was statistically not significant. Overall the incidence of babies of low Apgar score at both 1 min and 5 min among vaginal delivery, EmCS and ElCS in the study group was similar.

When comparing the differences in Apgar score less than 7 at 1 min and 5 min in patients having vaginal delivery in the study and the comparison group, the difference was statistically not significant.

TABLE XVIII
SCBU ADMISSION IN RELATION TO THE MODE OF DELIVERY IN THE STUDY AND COMPARISON GROUP

Duration of Admission	Study Group				Comparison Group			
	SVD	Inst. del.	Em LSCS	El LSCS	SVD	Inst. del.	Em LSCS	El LSCS
Nil	28	12	41	15	84	7	2	0
Up to 24 hrs	2	0	4	0	4	2	1	0
More than 24 hrs	1	1	8	1	2	4	0	0
Total	31	13	53	16	90	13	3	0

In the study group, 2 neonates out of 37 in the vaginal delivery and 4 neonates out of 69 in the repeat CS group were admitted to SCBU for up 24 hrs. This difference was statistically not significant. Out of 37 vaginal deliveries, 2 neonates and out of 69 repeat CS, 9 neonates were admitted to SCBU for more than 24 hrs. This difference was statistically not significant.

In the comparison group, out of 103 vaginal deliveries, 6 neonates and out of 3 emergency CS, 1 neonate was admitted to SCBU for up to 24 hrs. This difference was statistically not significant. In the vaginal delivery group, 6 neonates out of 103 were admitted to SCBU for more than 24 hrs and none from the 3 emergency CS. This difference was statistically significant ($p<0.02$).

When SCBU admission in the vaginal delivery group of study and comparison group were compared, the difference in the rate of neonate SCBU admission for up to 24 hrs and more than 24 hrs, the difference was found to be statistically not significant.

Reasons for SCBU Admission in the Study Group Neonates

Among 31 patients having spontaneous vaginal delivery 3 neonates were admitted to SCBU. One was admitted for 24 hours for moderate birth asphyxia and another for 24 hours for poor cry and grunting type of respiration. 1 baby was admitted for 7 days because of septicemia. Among 6 patients having instrumental delivery, 1 baby was admitted for 3 days because of moderate birth asphyxia.

Among 53 patients undergoing Em LSCS, 4 neonates were admitted for 24 hours, 3 due to asphyxia and 1 due to thick meconeum stained liquor. 8 neonates were admitted for more than 24 hours, 6 due to asphyxia, 1 due to thick meconeum stained liquor with poor cry and 1 due to septicemia.

The neonatal morbidity was similar for babies delivered vaginally and abdominally, with no significant difference between those delivered by emergency or elective LSCS.

Among 16 patients delivered by El LSCS, 1 baby was admitted to SCBU for 2 days due to asphyxia and grunting type of respiration.

Reasons for SCBU Admission in the Comparison Group Neonates

Among 90 patients having spontaneous vaginal delivery, 6 neonates were admitted to SCBU. Among these 4 were admitted for 24 hours; 1 due to asphyxia, 1 due to poor cry, 1 due to meconeum aspiration. Among the 2 babies admitted for more than 24 hours, 1 was due to moderate birth asphyxia and 1 due to low birth weight.

Among 13 patients having instrumental vaginal delivery, 6 babies were admitted to SCBU. 2 were admitted for 24 hours due to moderate birth asphyxia and 4 were admitted for more than 24 hrs due to moderate birth asphyxia and 4 were admitted for more than 24 hrs due to moderate birth asphyxia-2 babies, and severe birth asphyxia- 2 babies.

Among 3 patients delivered by Em LSCS, 1 baby was admitted to SCBU for 24 hrs due to moderate birth asphyxia. Overall the neonatal morbidity was similar following spontaneous vaginal delivery, instrumental vaginal delivery and caesarean delivery.

DISCUSSIONS

6. DISCUSSIONS

This study was done in the Maternity Hospital, Thapathali to see the outcome of the term pregnancies in patients with previous one caesarean delivery in this set up. Their outcome was compared with patients who have had only vaginal deliveries in the past.

This hospital was established in 1958 AD with 40 obstetric beds. Now the hospital has 300 beds where average number of deliveries per day is 40.63. Annual deliveries in this hospital has increased from 10,168 in 2042 B.S (1985/86) to 14,407 in 2052 B.S. (1995/1996) i.e. within 10 years period.

The baseline data obtained during the study period of four months i.e. from 1st Asoj 2054 to 29th Poush 2054 (17 September 1997 to 13 January 1998) are as follows:

- Total obstetric admission = 5,302
- total antepartum and intrapartum admissions = 5,149
- Patients with previous 1 LSCS = 151
- Patients with previous 1 CS included in the study= 106
- Patients with previous 1 CS not included in the study= 45
- Patients with previous 2 CS = 17
- Patients with previous 3 CS = 1
- Total deliveries = 4,595
- Total caesarean section = 517 (11.25% of all deliveries)

Total repeat CS in patients with previous one or more CS= 112 (21.66 of all CS) All 17 patients with previous 2 CS and 1 patient with previous 3 CS had repeat elective CS.

During the study period, the four major indications for CS were :

(i)	FD	=	155 i.e. 29.98% of CS
(ii)	NPOL	=	47 i.e. 9.09% of CS
(iii)	Breech pr	=	46 i.e. 8.89% of CS
(iv)	CPD	=	38 i.e. 7.35% of CS

Repeat CS in patients with previous one or more CS was performed in 112 accounting for 21.66 percent of total CS.

During this study period of four months, a total of 169 patients with previous one or more CS were admitted in this hospital accounting for 3.28% of all ante and intrapartum patients. In this study, a total of 106 patients with previous one CS fulfilling the inclusion criteria for the study group were taken i.e. 2.05% of all ante and intrapartum admission. Among these, 16 patients had ElCS (15.09 percent), a total of 90 patients (84.91%) were observed in spontaneous labour with the aim of giving a trial of labour (TOL). The percentage of TOL allowed in a study or an institution in a patient with previous CS is variable. Paterson and Saunders in their study of 1,059 patients with singleton feotus , at least 37 weeks of gestation, cephalic presentation with history of one previous CS and no other delivery had TOL in 63 percent patients. Flamm et al in a 5 year multi centre collaborative study had a low 38% TOL. At Coombe Women's Hospital, Dublin TOL was 68.5% in 1995, while at Agha Khan Medical Centre, Pakistan, it was 60.54% in a study done from 1987 to 1993. At National University Hospital, Singapore, TOL was in 70.9% in the 6 year study period, 1985 to 1990. A high TOL of 84% has been reported by Turnquest et al in a study of 259 patients at the University of Loiusville, USA.

In my study, 37 patients out of 106 patients with previous one CS had vaginal delivery, giving a rate of VBAC of 34.90%. Among 90 patients undergoing TOL, VBAC in 37 accounted for 41.11% VBAC in TOL group. In a review by Chua and Arulkumaran, the VBAC has been reported to range from 38 to 93%. Aurora et al found a very low 27%

rate of vaginal delivery, while Cowen et al have reported a success rate of 81.0% in those undergoing TOL. At Coombe Women's Hospital, Dublin, VBAC was 79.9% in those undergoing TOL in 1995, while in a study done at National University Hospital Singapore, it was 70% in those undergoing TOL between 1985 to 1990.

In my study, age did not have any influence on the mode of delivery. There was no influence of socio-economic status on the mode of delivery in both the study and comparison group. ANC care was more satisfactory in the study group patients than the comparison group patients. All 16 patients who had elective repeat CS had 3 or more ANC visits. In those with satisfactory ANC care, taken as 3 or more visits, there was a higher incidence of EmCS in the study group. In 90 patients undergoing TOL in the study group among those with no ANC care, there was no difference in the mode of delivery. There was no influence of ANC care on the mode of delivery in the comparison group. ANC care and socio-economic status related to patient education, may be important in deciding the mode of delivery. In my study, the patients did not take active part in the decision regarding whether to undergo a TOL or not but al. agreed with the obstetrician's decision. Both patients' desire, resistance or acceptance of TOL, VBAC or repeat elective CS and the physician factor have been found to be important in many studies.

In my study, there was no influence of previous vaginal delivery on the mode of present delivery in the study group. In the comparison group, there was no influence of parity on the present mode of delivery. This finding is in contrast to many reports which state that history of previous vaginal delivery is a significantly favourable factor for vaginal delivery in the current pregnancy in patients with previous CS. Singh et al found 83.33% success rate of vaginal delivery in patients with a previous vaginal delivery, while it was 58.33% in those with no previous vaginal delivery. Kore et al found 63.30% versus 39.10% vaginal delivery rate in those with and without previous vaginal delivery respectively. Bedoya et al found 95.24% versus 82.95% vaginal delivery rate. Wasti et al

in a retrospective study found no influence of previous vaginal delivery on the present mode of delivery.

The major indication for repeat elective CS (11 out of 16) and emergency CS (25 out of 53) was CPD. In total, 36 patients out of 69 undergoing repeat CS, CPD was the indication i.e. 52.17%. Aurora et al found 77.75% repeat elective CS for CPD in their study. Miller et al found CPD to be a major cause for a failed TOL in 85% of the failed TOL due to CPD. Flamm et al also found that when the previous CS was for CPD, the success rate was lowered. The lowest success rate has been reported for previous CS for CPD and FTP which are regarded by many as recurrent indications. Highest success rate for vaginal delivery has been reported in previous CS for non recurrent indications like APH, breech presentation and FD. In the present study, vaginal delivery rate was 100% for the previous CS for APH, 60% for breech presentation 33.33% for FD and 20.83% for CPD. In literature, highest success rate has been reported for FD and breech presentation. Miller et al report success rate for FD and breech presentation of 88 to 100%, while for CPD it is 54%. Lovell reports 76% vaginal delivery rate for CPD/FTP, 96% for breech presentation and 70% for FD. Miller and Leader report vaginal delivery rate of 52% for CPD, 84% for breech presentation and 54% for FD. Wasti et al found in their study vaginal delivery rate of 82.9% for breech presentation. 75.4% for FD, 67.6% for FTP and 58.9% for CPD.

In the present study, CPD was a clinical diagnosis made by a senior obstetrician. In none of the cases was X-ray pelvimetry done. 36 patients out of 106 study group patients had a diagnosis of CPD and repeat CS for that indication. None of the patients in the comparison group had a diagnosis of CPD.

None of the patients in the study or comparison group had labour induced. The only method of labour augmentation in the study group was by ARM. There was a higher rate of vaginal delivery in those who were augmented than those who were not in the study

group i.e. 70% versus 32.86% ($p<0.01$). In the comparison group, labour was augmented by ARM, oxytocin and both. In this group, the difference in the vaginal delivery rate between augmented and non augmented patients, was statistically not significant. Paterson and Saunders in their study had augmentation rates ranging from 0 to 40% with vaginal delivery rate from 33 to 87%. In their study, vaginal delivery rate in spontaneous and induced labour and augmented and non augmented labour was similar (4). Singh et al had 58.33% augmented labours with oxytocin with vaginal delivery rate of 92.85% without any case of uterine rupture. NPOL or FTP can only be diagnosed after adequate uterine activity for a sufficient length of time, otherwise a TOL may be abandoned prematurely. Miller et al found no difference in the rate of vaginal delivery in those with or without use of oxytocin, while Flamm et al report a less successful vaginal delivery rate in patients who received oxytocin (68%) compared to those who did not (78%). Flamm et al believe that oxytocin augmentation may have been necessary in labours which were prolonged perhaps due to a subclinical CPD, hence the lower rate of vaginal delivery. In most studies, the method of augmentation has been ARM combined with oxytocin.

In the present study among 90 patients in the study group undergoing TOL, 40 patients had EmCS in the latent phase of labour and 50 patients were observed in active labour. Among these 50 patients, 32 were in active labour for up to 4 hours and 23 had vaginal delivery. Out of 18 patients who were in active labour for more than 4 hours, 14 had vaginal delivery. This difference was statistically not significant.

In my study, the relation of present foetal birth weight with the previous foetal birth weight did not have any influence on the mode of present delivery. When equal or smaller present foetal weight, there was a higher incidence of repeat CS in the study group. When present feotal weight was larger or could not be compared to previous foetal birth weight (unknown and previous twin delivery), the difference in the rate of repeat CS and vaginal delivery was not significant. Overall in patients with previous CS, the

incidence of repeat CS was more irrespective of present foetal birth weight being larger, smaller or similar to the previous one. In the comparison group, there was no influence of the relation of present and previous foetal birth weight on the mode of delivery. The mean birth weight in the vaginal delivery group of 2.78 was lower than the repeat em CS of 3.0 kg and el CS of 2.97 kg in the study group. In the comparison group, mean birth weight in the vaginal delivery group was 3.03 kg, larger than 2.92 kg of em CS. In many studies, it has been reported that current infants' birth weight does not influence the outcome of TOL. Some studies have found that the success of TOL was favourably influenced by a smaller baby in the present pregnancy. In a review by Chua and Arulkumaran, in a case controlled study no significant difference in maternal and perinatal morbidity was found for women who underwent TOL and delivered infants more than 4 kg compared to those who delivered infants less than 4 kg.

The knowledge of previous foetal birth weight may be important in deciding the mode of delivery in this pregnancy. Though not used in the present study, the previous birth weight and current estimated foetal birth weight might be helpful to decide about TOL, especially when the previous CS was for CPD.

Mean hospital stay was 2 days for SVD, 1.83 days for instrumental deliveries, whereas it was 8.18 days for repeat CS in the study group. In the comparison group, it was 1.75 days for SVD, 3.46 days for the instrumental deliveries and 7 days for em CS. The postnatal hospital stay was found to be significantly more in patients delivered by repeat CS in many studies.

In the study group, the difference in complications during labour and delivery in vaginal delivery and repeat CS was statistically not significant. Also there was significant difference in em CS and el CS during labour and delivery. The incidence of scar dehiscence was 2 out of 106 i.e. 1.88% and no case of scar rupture was diagnosed in this series. Out of 37 vaginal deliveries in patients with previous CS, only 20 patients had

manual exploration of the lower uterine segment after delivery, hence all cases of scar dehiscences may not have been recognized. The overall reported incidence of scar rupture/dehiscence is low ranging from 0.3% to 1.2%. The incidence of scar rupture/dehiscence following TOL ranges from 0.3 to 1.8%. The most significant complication in both the study and comparison group was PPH, 7.55% in both groups. Lovell reports a higher incidence of PPH after vaginal delivery following TOL. Chazotte and Cohen report 2.4% incidence of catastrophic complications in 711 patients with previous CS. The catastrophic complications have been defined as those consisting of maternal or foetal death, hemorrhage needing 5 or more units of blood transfusion, hysterectomy, major artery ligation, emergency hysterectomy for uterine rupture or ruptured uterus with feotus extruded in the abdominal cavity and placenta accreta confirmed histologically after hysterectomy. Coultier-Smith et al found previous CS a significant risk factor for major obstetric hemorrhage defined as hemorrhage after 25 completed weeks of gestation requiring at least 6 units of blood transfusion.

Puerperial complications were more in patients undergoing repeat CS than vaginal delivery in the study group. This difference was statistically not significant between EmCS and ElCS. In the comparison group, also puerperial complications were more in patients undergoing EmCS than vaginal delivery. The major puerperial complication detected in both the groups was puerperial pyrexia, in 18 patients in the study groups undergoing repeat CS i.e. 16.98% and 2 patients undergoing EmCS in the comparison group i.e. 1.89%. Only 1 patient having the vaginal delivery in the study group had puerperial pyrexia. The incidence of puerperial pyrexia is found more in patients delivered by the abdominal route. These puerperial complications are reported to be higher after an EmCS for failed TOL than these undergoing ElCS. Soltan et al report higher incidence of febrile morbidity in patients undergoing EmCS as compared to those undergoing elective CS. No case of maternal death occurred in my study.

The feotal outcome in my study was not influenced by the mode of delivery. There was one fresh still-birth in emergency CS of study group giving perinatal mortality of 9.43 per thousand live births. There was one fresh still-birth in the vaginal delivery of the comparison group giving a perinatal mortality of 9.43 per thousand live births. Mean birth weight in the study group was 2.92 kg and comparison group 3.03 kg. Mean birth weight in the vaginal delivery group in the study group was 2.78 and in the comparison group, it was 3.03 kg. In the study group, Apgar score difference at 1 minute and 5 minutes of less than 7 in the vaginal delivery and repeat CS groups was statistically not significant. In the comparison groups also Apgar score difference at 1 min and 5 min of less than 7 in the vaginal delivery and emergency CS was statistically not significant. Regarding SCBU admission, in the study group, no statistically significant difference was seen between vaginal delivery and repeat CS in neonatal SCBU admission for up to 24 hours and more than 24 hours. In the comparison group, SCBU admission up to 24 hours was not significantly different in vaginal delivery and emergency CS.

In most of the studies, perinatal morbidity and mortality is not associated with mode of delivery in patients with previous CS. Flamm et al found an incidence of Apgar score less than 7 at 5 min 0.9% and perinatal mortality of 6/1000. Thomas and Khan in their study of 876 patients with previous CS did not have any perinatal mortality related to the mode of delivery i.e. in either elective CS or in TOL group. Associated congenital anomalies and antepartum feotal deaths and conditions like hydrops foetalis contributed to stillbirths and neonatal deaths in their studies. Kore et al found perinatal mortality of 9% in 137 patients of vaginal delivery group and 4.4% of 172 patients who had emergency CS after a failed TOL. Rosemary Lovell found no significant difference in the number of low Apgar scores in TOL and elective CS groups. Miller and Leader also found that perinatal morbidity was unaffected by the mode of delivery. There was no difference in the incidence of admission to level 3 nursery and need for ventilation and neonatal seizures in the different modes of delivery.

SUMMARY AND CONCLUSIONS

7. SUMMARY AND CONCLUSIONS

7.1 Summary

A total of 106 patients with previous one CS fulfilling the inclusion criteria were taken for the study group. For the comparison group, a total of 106 patients with matching age, parity and previous vaginal delivery were taken.

The rate of vaginal delivery in the study group was 34.9 percent, while it was 97.16 percent in the comparison group.

Age, socio-economic status and history of vaginal delivery did not have any influence in the mode of delivery in both the groups.

16 patients who had ElCS in the study group had LSCS planned during antenatal care.

The major indication for repeat CS was CPD. A total of 36 patients with previous one CS had repeat Em or ElCS for CPD, 36 out of 69 total repeat CS i.e., 52.17% repeat CS were performed for CPD. The next frequent indication was scar tenderness. 13 out of 14 patients with scar tenderness were found to have intact scars intraoperatively. One out of 106 patients with previous CS had silent scar dehiscence diagnosed intraoperative when EmCS was performed for another indication (FD).

The highest rate of vaginal delivery was found in patients with previous CS for APH (100%) and breech presentation (60%).

Patients with previous CS who were admitted in advanced active labour and second stage of labour had a higher incidence of vaginal delivery. In the comparison group, the status of labour on admission did not have any influence in the mode of delivery.

Previous CS patients who were augmented with ARM had a higher rate of vaginal delivery than non augmented ones. There was no significant difference in the rate of vaginal delivery between augmented (by ARM, oxcytocin or both) and non augmented labours in the comparison group.

Patients with previous CS who were allowed to go into spontaneous labour and had TOL for longer than 4 hours had a significantly higher rate of vaginal delivery.

The relation of the present and previous foetal birth weight did not influence the mode of delivery in the study and comparison group, as this factor was not taken into consideration when deciding the mode of delivery.

The incidence of complications during labour mainly primary PPH, was similar in vaginal delivery and repeat CS in the study group. In the comparison group also it was similar in both vaginal delivery and emergency CS.

The incidence of puerperial complications, mainly puerperial pyrexia was higher in those delivered by CS than those having vaginal delivery in both the study and comparison group. There was no difference in the incidence of puerperial complications between emergency and elective CS.

The mean hospital stay was significantly less in those delivered vaginally than abdominally in both the groups.

The mean birth weight in the study group was less in patients having vaginal delivery than those having repeat CS. In the comparison group, the mean birth weight was more in patients delivered vaginally than by emergency CS.

The incidence of low Apgar score of less than 7 at 5 minutes was not different between vaginal or caesarean delivery in both the study and comparison group.

Neonatal SCBU admission rate was not different between vaginal delivery and repeat CS in the study group. The perinatal mortality was same in the study and comparison group.

7.2 Conclusions

Patients with previous caesarean delivery are at high risk of repeat emergency or elective CS. About one in three patients with previous CS delivered vaginally in this study. There was a lower incidence of adverse maternal and foetal outcome in patients delivering vaginally. If trial of labour is allowed under careful patient selection and supervision, the incidence of vaginal birth after caesarean section can be increased safely.

APPENDICES

APPENDIX-I
BIBLIOGRAPHY

BIBLIOGRAPHY

1. Textbook "William's Obstetrics" 20th edition 1997 "Caesarean delivery and Caesarean hysterectomy" 509-531

2. Michael J. Turner "Delivery after one previous caesarean section" Am. J. Obstet Gynaecol 1997; 176: 741-744

3. F.P Meehan, N.M. Rafia, I.I. Bolaji "Delivery following previous caesarean section" Progress in Obstetrics and Gynecology, Vol 10: 213-228

4. Dewhurst's Textbook of Obstetrics and Gynaecology for Post Graduates, 5th edition 1995 "Obstetric Operations and Procedures" J.W.K. Ritchie 392-396

5. Bruce L. Flamm, Lawrence A. Newman, Steven J. Thomas, Debbie Fallon and Michael M. Yoshida "Vaginal birth after caesarean delivery: Results of a 5-year multicentre collaborative study" Obstetrical and Gynaecological Survey, June 1991, Vol. 146, No 6; 360-362

6. S. Chua, S. Arulkumaran, R Haththotuwa Textbook "Management of Labour" "Management of women with previous caesarean section scar", 1996, 317-327

7. C.J. Kelleher and Linda D. Cardozo "Caesarean section: a safe operation ?" Journal of Obstetrics and Gynaecology 1994, 14; 86-90

8. Eric S. Miller, Jeanette Partezana, and Ruth L. Montgomery "Vaginal birth after caesarean: A 5-year experience in a family practice residency program" JABFP Sept - Oct 1995, Vo.l 8, No 5; 357-360

9. Raksha Arora, P Rajaram Asha and Oumaguchi Josephine "Outcome of post caesarean pregnancy in a tertiary institute in South India" Journal of obstetric and gynecology June 1992 Vol 42, No 3; 334-339

10. Catherine M. Paterson and Nigel J. St. G. Saunders "Mode of delivery after one caesarean section: Audit of current practice in a health region" Obstetrical and Gynaecological Survey. May 1992, Vol 47, No 5 ; 309-311

11. V.K. Singh, M Nawani, A. Bhagoliwal and B Rohatgi "Trial of labour in patients with previous caesarean section" Journal of Obstetric and Gynaecology, October 1995, Vol 45 No 5 ; 640-643

12. Takehiko Yasumizu, Akira Nozawa, Toshihiko Kinoshita and Junzo Kato "Trial of vaginal birth following caesarean section for arrest disorders of labour : Analysis of patients with well-documented medical records" Asia-Oceania J. Obstet. Gynaecol 1994, Vol 20, No 4; 407-413

13. M. Thomas and G. Q. Khan "Outcome of pregnancy in patients with one previous caesarean section" Journal of Obstetrics and Gynaecology, 1994, 14; 416-419

14. Shailesh Kore, Sudha Nair, Rahul Mayekar and V.R. Ambiye "Vaginal delivery after caesarean section" Journal of Obstetric and Gynaecology, June 1996, Vol 46, No 3; 328-333

15. Shenaz Wasti, Azhar Turab, Zia Agha, Fahim Qazi, Fuad Hussany, Hamida Farid and Javaid H. Razvi " An audit of labour following caesarean section at the Agha Khan Medical Centre" Aust NZ J. Obstet Gynaecol 1994, 34: 5; 527-530

16. Bruce L Flamm, , Marc. W. Fried, Neal M. Lonky, and Wendy Saurenman Giles "External cephalic version after previous caesarean section" Am J. Obstet Gynaecol August 1991 Vol 165, No 2; 370-372

17. Rosemary Lovell "Vaginal birth after caesarean section : Factors influencing success rates" Aust NZ J Obstet Gynaecol 1996, 36; 1:4-8

18. J. M. Stronge, Kathryn Mc Quillan, M.Robson and H. Johnson "Factors affecting mode of delivery in labour following a single previous birth by caesarean section" Journal of Obstetric and Gynaecology 1996, Vol 16; 353-357

19. Bruce L. Flamm and Ann. M. Geiger "Vaginal birth after caesarean delivery: An admission scoring system" Aust NZ J. Obstet. Gynaecol 1992, 32; 3; 213-216

20. Marc Miller and Leo R. Leader, "Vaginal delivery after caesarean section" Obstetric & Gynecology Dec. 1997, Vol. 90, No 6; 907-910

21. S. Chua and S. Arulkumaran "Trial of Scar" Aust NZ J. Obstet. Gynaecol 1997, 37; 1:6-12

22. C. Bedoya, JL Bartha, I Rodriguez, I. Fotantan, J. M. Bedoya and J. Ramos Sanchez "A trial of labour after caesarean section in patients with or without a prior vaginal delivery" Int. J. Gynecol-Obstet Dec. 1992, 39(4); 285-289

23. M.J. Turner and Catharene Casey "Delivery after caesarean section : proposed analysis" Journal Obstetric and Gynaecology 1996, Vol. 16; 513-514

24. J. Kline and F. Aries "Analysis of factors determining the selection of repeated caesarean section on trial of labour in patients with histories of prior caesarean delivery" J-Reprod-Med. Apr. 1993, 38 (4); 289-292

25. Adel T. Abu-Heija "Vaginal birth after one previous caesarean section: A Jordanian experience" J. Obstet. Gynaecol 1995 21 (1); 9-12

26. R.W. Naef, M.A. Roy, SP. Chauhan, H Roach, P.L. Blake and J.N. Martin Jr." Trial of labour after caesarean delivery with lower segment vertical uterine incision: is it safe ?" Am J. Obstet Gynaecol June 1995, 172 (6); 1666-1673

27. Debra K. Grubb, Siri L. Kjos and Richard H. Paul " Latent labour and unknown uterine scar" Obstetric Gynaecology. Sept. 1996, Vol. 88, No 3; 351-355

28. G. F. Joseph Jr, C.M. Stedman and A.G. Robichaux, "Vaginal birth after caesarean section : the impact of patient resistance to trial of labour" Am J. Obstet-Gynaecol. June 1991, 164 (6) part 1; 1441-1447

29. T.A.J. Mould, S. Chong, J.A.D. Spencer and S. Gallivan "Women's involvement with the decision preceding their caesarean section and their degree of satisfaction" British Journal of Obstetric and Gynaecology. Nov. 1996, Vol. 103; 1074-1077

30. T.K. Lau, S.H. Wong and C.Y. Li " A study of patients acceptance towards vaginal birth after caesarean section" Aust N.Z J Obstet Gynaecol 1996, 36 (2); 155-159

31. E. Paul Kirk, Kathleen A. Doyle, Janet Leigh and Mary L. Gassard " Vaginal birth after caesarean section or repeat caesarean section: Medical risk or social realities ?" Am J. Obstet Gynaecol June 1990, Vol. No 6 ; 1398-1404

32. Shailesh Kumar and Panos Maouris "Induction of labour for trial of vaginal birth after caesarean section in a remote district hospital" Aust NZ J. Obstet. Gynaecol 1996, 36, 4; 417-420

33. S. Arulkumaran, I. Ingermarsson and SS Ratnam "Oxytocin augmentation in dysfunctional labour after previous caesarean section" British Journal of Obstetrics and Gynaecology 1989, 96, 939; 310-312

34. Hiroyuki Asakure and Stephen A Myers "More than one previous caesarean delivery : A 5-year experience with 435 patients" Obstetrics & Gynecology June 1995, Vol. 85, No 6 ; 924-929

35. Raana N. Jamelle "Outcome of unplanned vaginal deliveries after two previous caesarean section" J. Obstet Gynaecol 1996, Res. Vol. 22, No 5; 431-436

36. S. Grisaru Granovsky, M Shaya and Y.Z Diamant "The management of labour in women with more than one uterine scar : is a repeat caesarean section really the only "safe" option ?" J. Perinat-Med. 1994, 22, 1 : 13-17

37. E. G. Tamale - Sali and M.N. Iskander "Is there a risk of lower segment scar rupture in pregnancy after multiple caesarean sections ?" Journal of Obstetrics and Gynecology 1992, Vol. 12; 19-21

38. A.V.G. Taylor, Susan Sellers, M. Ah. Moye and I.Z. Mackenzie " A prospective random allocation trial to compare vaginal prostaglandin E_2 with intravenous oxytocin for labour induction in women previously delivered by caesarean section" J. Obstetrics and Gynaecology 1993, Vol. 13 ; 333-336

39. Vatsla Dadhwal, Geeta Kinra and Kamal Buckshee "Cervical ripening with prostaglandin in women with previous one caesarean section " Journal of Obstetric and Gynaecology June 1997 Vol. 47 No 3; 245-249

40. A. S. Leung, RM. Farmer, E.K. Leung, AL Medearis and R.H. Paul "Risk factors associated with uterine rupture during trial of labour after caesarean delivery: a case-control study" Am J. obstet gynaecol. May 1993, 168(5): 1358-1363.

41. K. Asaad and A.B. Alaily. "Oxytocin use and delivery outcome in women with one previous caesarean section and pre-labour rupture of the membranes at term" Journal of Obstetrics and Gynaecology 1994, 14 ; 420-422

42. Nirmala Tated "Oxytocin usage in trial of labour in previous caesarean section cases" Journal of Obstetric and Gynecology, June 1988, Vol. 38 No 3 ; 293-294

43. B. Kaplan, M. Royburt, Y. Peled, M. Hirsch, M. Hod, Y. Ovadic and A. Neri "Routine revision of uterine scar after previous caesarean section" Acta - Obstet - Gynaecol - Scand. July 1994, 73(6): 473-475

44. MA. Turnguest, T. James, C. Marcell and J. A Spinnato "Vaginal birth after caesarean section in a university setting" J-Ky-Med-Assoc Jun. 1994, 92(6) : 216-221

45. R.M. Farmer, T. Kirschbaum, D. Polter, T.H. Strong and A.L. Medearis "Uterine rupture during trial of labour after previous caesarean section " Am. J. Obstet Gynaecol Oct. 1991, 165 ; 996-1001

46. Michael L. Tuggy "Uterine-Vesicular rupture during trial of labour" JABFP Sept-Oct 1995, Vol. 8, No 5; 405-404

47. S. Arul Kumaran, S. Chua and S.S. Ratnam " Symptoms and signs with scar rupture - value of uterine activity measurements" Aust NZ Obstet Gynaecol 1992, 32, 3; 208-213

48. Cynthia Chazotte and Wayne R. Cohen "Catastrophic complications of previous caesarean section" Am J. Obstet Gynaecol. Sep. 1990, Vol. 163, No. 3; 738-742

49. M. Fukuda, T. Shimizu, Y. Ihara, K. Fukuda, E. Natsuyame and M. Mochizuki "Ultrasound examination of caesarean section scars during pregnancy" Obstetrical and Gynaecological Survey. October 1991, Vol. 46, No 10 ; 676-678

50. B.M. Petrikovsky "Endoscopic assessment of the integrity of the post caesarean uterine wall before trial of labour". Trans- cervical Endoscopy Registry, J. Reprod - Med June 1994, 39 (6) ; 464-466

51. B. L. Flamm, J.R. Goings, Y. Liu and G. Isadik Wolde "Elective repeat caesarean delivery versus trial of labour : a prospective multicentre study" obstet-gynaecol, June 1994, 83, 6 ; 927-932

52. M. H. Soltan, N. Chowdhury and B. Adelusi "Postoperative febrile morbidity in emergency and elective caesarean section" Journal of Obstetric and Gynaecology 1996, Vol. 16 : 508-512

53. S.D. Coulter - Smith, M. Holohan and M.R.N. Darling "Previous caesarean section: a risk factor for major obstetric hemorrhage ?" Journal of obstetrics and gynecology 1996, Vol. 16; 349-352

54. O. Behrens, K. Goeschen, H. Jakob and W. Kauffels. "Induced labour with prostaglandin E2 gel after previous caesarean section" Ge burtshilfe. Frauenheilled March 1994, 54 (3);144-150

55. J. A. Khouri and M. G. Sultan. "Previous caesarean section and the rising incidence of placenta previa and placenta accreta" Journal of Obstetrics and Gynaecology 1994, Vol. 14; 14-16

56. Cande V Ananth , John C. Smulian and Anthony, M. Vintzitcos "The association of placenta previa with history of caesarean delivery and abortion : A mentanalysis" Am J. Obstet Gynaecol Nov. 1997, Vol. 177, No 5; 1071-1078

57. S. Krishnamurthy, F. Fairlie, A.D. Cameron, J.J. Walker and J.R. Mackenzie "The role of postnatal X-ray pelvimetry after caesarean section in the management of subsequent delivery" Obstetrical and Gynaecological Survey Feb. 1992, Vol. 47, No 2; 103-104

58. T.V. Nguyen, T.V. Dinh, MS. Suresh, RA Kinch and G.D. Andesson. "Vaginal birth after caesarean section at the University of Texas" J-Reprod-Med Oct. 1992, 37 (10); 880-882

APPENDIX-II
QUESTIONNAIRE

QUESTIONNAIRE ON OUTCOME OF A TERM PREGNANCY WITH ONE PREVIOUS CESAREAN SECTION

1. **Name of the patient** - Study Population ☐ No .....
   Comparable Group ☐ No .....
2. **Name of the spouse** - I.P. No .....
   DOA .....
3. **Address** - Temporary ☐ TOA .....
   Permanent ☐ DOD .....
   c) Rural b) Urban ☐ Hospital Stay .....
   L.M.P .....
4. **Age (yrs)** ☐

   a) <15 b) 15-19c) 20-24 d) 25-29
   e) 30-37 f) 35-39
5. **Ethnic Group** ☐

   a) Brahmin b) Chhetri c) Newar
   d) Gurung/Magar/Rai/Limbu e) Lama/Sherpa/Tamang g) Others
6. **Religion** ☐

   a) Hindu b) Buddhist c) Muslin d) Others, specify
7. **Socio-economic status**

   7.1 Occupation - Husband/Wife ☐/☐

   a) Housewife b) Business c) Service d) Daily wages/labourer
   e) Unemployed

   7.2 Education - Husband/Wife ☐/☐

   a) Doctorate b) Graduate c) Intermediate d) Secondary School
   e) Primary School f) Illiterate

   7.3 Water Supply ☐

   a) Piped b) Tubewell/Closedwell) Openwell/Pond
   e) Spring/Stream

7.4 Latrine used of home ☐

a) Flush b) Pour flush c) Pit d) Open field

7.5 Fuel used ☐

a) Electricity b) Gas c) Kerosene d) Firewood e) Cow dung

7.6 Vehicle ☐

a) Car b) Motor bike c) Bicycle d) None

8. Past Obstetric History

No. of - Pregnancies ☐

Abortions ☐

Ectopic Pregnancies ☐

9. Previous Deliveries

	a) Vaginal delivery	b) LSCS	c) M/F	d) SB/NND	e) Alive	f) Age
1.	☐	☐	☐/☐	☐/☐	☐	☐
2.	☐	☐	☐/☐	☐/☐	☐	☐
3.	☐	☐	☐/☐	☐/☐	☐	☐
4.	☐	☐	☐/☐	☐/☐	☐	☐

10. Contraception Used - ☐

a) None b) Natural c) Barrier d) DMPA e) OCP f) Norplant

11. Duration of Contraception used ☐

a) ≤ /yr. b) ≥ /yr.

12. Previous /Present total birth weight (kg) ☐/☐

a) <1-5 b) 1.5 - 1.99 c) 2.0 - 2.49 d) 2.5 - 2.99 e) 3.0 - 3.49
f) 3.5 - 399 g) ≥ 4

13. **Antenetal Check up** ☐

a) Nil b) 1-2 visits c) ≥ 3 visits

14. **BP & Protein uric** ☐

a) Within normal limits b) Raised BP without protein uric
c) Raised BP with protein uric

15. **Hemoglobin (gm%)** - Predelivery/Post delivery ☐/☐

a) <5 b) 5-6.9 c) 7-9.9 d) ≥ 10

16. **Labour Status** ☐

a) Not in laser b) Latent phase c) Early active phase (3-4 cm)
d) Advanced active phase (> 4 cm) e) Second stage of labour

17. **Pelvic Assessment** ☐

a) Clinically b) Clinically CPD c) Clinically borderline
d) CPD by X-ray pelvimetry e) Adequate by f) X-ray pelvimetry

18. **Labour Augmentation** ☐

a) Nil b) ARM c) Oxytocin d) ARM + Oxytocin

19. **No. of hours in active labour in hospital** ☐

a) 0 b) ≤ 1 hr. c) 1- 3 hrs. d) > 3 hrs.

20. **Mode of delivery** ☐

a) S.V.D b) Emergency LSCS c) Elective LSCS

21. **Foetal outcome & sex** ☐/☐

a) Alive b) SB c) NND d) Male e) Female

22. **Apgar score at 1min/5 mins** ☐/☐

a) <5 b) 5-7 c) 8-10

23. Admission to SCBU ☐

a) Nil b) <24 hrs. c) >24 hrs.

24. Reason for SCBU admission ☐

a) Asphyxia b) Low birth weight c) Septicemia d) Traumatic delivery
e) Other, Specify

25. Indication for previous of present LSCS ☐/☐

a) FD b) CPD c) NPOL d) Failed IOC d) Post term
e) Breech presentation f) Scar tenderness g) Other, specify

26. Maternal Complications during delivery ☐

a) Nil b) PPH c) Scar rupture/dehiscence d) Retained placenta
e) Bladder/Bowel Injury f) Blood transfusion needed
g) Significant Genital tract injures h) Vulval/Vaginal hematomes
i) Others, specify

27. Puerperal complications ☐

a) Nil b) Paralytic ileus c) Puerperal pyrexia d) Secondary PPH
e) Wound Infection f) Exploration of uterine cavity performed f) Others, specify