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A comparative study of maternal and fetal outcome in trial of labour after caesarean section and elective repeat cesarean section

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Abstract
Background: Caesarean section is one of the commonest operations performed on childbearing women, with rates continuing to rise worldwide. Previous caesarean delivery is one of the most common indications for repeat caesarean delivery. One of the strategies proposed to reduce the rate of caesarean section is Trial of Labour (TOL). For women who have had a previous caesarean, choice for mode of birth in their next pregnancy is either a Trial of Labour after Caesarean (TOLAC) or an Elective Repeat Caesarean Section (ERCS).. Both ERCS and trial of labour have benefits and harms. The risks of TOL when compared with ERCS include haemorrhage, need for blood transfusion, endometritis, uterine rupture, perinatal death, and hypoxic is chaemic encephalopathy.
Materials and methods: A comparative study of women with term gestation with singleton pregnancy, who underwent one caesarean section after considering inclusion and exclusion crite were included in this study. A total of 90 cases were selected either from the outpatient department (booked) or in labour room (un booked). The study population was divided into 2 groups, 45 in each group. The patients who planned ERCS were put in one group and patients who underwent TOL in another group. Demographic data, details of obstetric history, intrapartum events and postpartum events were recorded.
Results: There were 1250 births during the study period. Among the 90 women who had a singleton gestation and a history of caesarean delivery, 45 under went a trial of labor and 45 had an elective repeated caesarean delivery who had indications for a repeated operation. The rate of uterine rupture was 4.5% in the TOL group and nil in ERCS group. The uterine dehiscence was 29.5%in TOL group as compared to 10.8% in the ERCS group. Augmentation of labor with oxytocin and induction of labor, regard less of method, were associated with a significantly greater risk of uterine rupture than was spontaneous labor without the use of oxytocin.
Conclusion: Trial of labor for women with a history of caesarean delivery is associated with an increased risk of adverse perinatal outcomes and a higher rate of maternal adverse events, as compared with elective repeat caesarean delivery.

Keywords: labour, caesarean, maternal adverse, outcome

Introduction

Caesarean section is one of the commonest operations performed on childbearing women, with rates continuing to rise worldwide. Previous caesarean delivery is one of the most common indications for repeat caesarean delive1y. One of the strategies proposed to reduce the rate of caesarean section is Trial of Labour (TOL). For women who have had a previous caesarean, choice for mode of birth in their next pregnancy is either a Trial of Labour after Caesarean (TOLAC) or an Elective Repeat Caesarean Section (ERCS). For women who attempt a Vaginal Birth after Cesarean Section (VBAC), the chance of achieving vaginal birth has been variably reported between 56% to 80%. The proportion of women attempting a trial of labour has been declining in many countries, fuelled by negative reports of an increase in the risk of maternal and infant complications related to trial of labour including uterine rupture and Perinatal death.

The rates of repeat caesarean birth have increased substantially. Both ERCS and trial of labour have benefits and harms. Risks of planned TOL when compared with planned ERC include haemorrhage, need for blood transfusion, endometritis, uterine rupture, perinatal death, and hypoxic ischaemic encephalopathy. By comparison, women planning ERCS are at increased risk of surgical complications, placenta accreta, and risks of multiple caesareans and their infants are at risk of respi ratory morbidity. The current study is to assess the maternal and fetal outcome of Trial of labour and repeat caesarean delivery and to find out which is safer for mother and fetus.

Various studies on trial of labour (TOL) done in the past have the following conclusions

1. A case control study in 2013 on factors associated with success of vaginal birth after caesarean section (VBAC) at three teaching hospitals in Addis Ababa, Ethiopia concluded that factors determining successful TOL were

history of trial of labour in past, rupture of membrane at the time of admission, cervical dilatation of more than 3cm at the time of admission. Meconium stained liquor, malposition, history of still birth were associated with failure of trial of labour (F-TOL). Factors like maternal age, past caesarean section, interdelivery interval, birth weight were not significant determinant for TOL [1].

2. A public health study of USA in 2013, on vaginal birth after caesarean section with the aim to assess the safety and success rate of vaginal birth after caesarean in selected patients with previous one caesarean delivery concluded that 85% cases had a successful VBAC and l 5o/o underwent a repeat emergency. Cervical dilatatior1 cm of more than 3 cm at the time of admission was a significant factor in favour of a successful VBAC. Birth weight of more than 3,000 gm was associated with a lower success rate of VBAC [2].
3. One study conducted in Australia by Australian Research Centre for Health of Women and Babies in 2012 on benefits and harms -planned vaginal birth or planned elective repeat caesarean concluded that elective repeat caesarean section is associated with lower risk of fetal or infant death or adverse outcome when compared to trial of labour and there were no significant difference in case of maternal outcomet [3].
4. Menacker *et al.* Study on Vaginal birth after caesarean: new insights, on maternal and neonatal outcomes in 2010 concluded that VBAC is a reasonable choice for majority of women. Adverse outcomes were rare for both elective repeat caesarean section and trial of labor [4].
5. A Study on Vaginal Birth After Caesarean: New Insights in 2010 by Oregon Health & Science University, Portland, to review the trends and incidence of VBAC, maternal benefits and harms, infant benefits and harms, relevant factors influencing each and the directions for future research, concluded that overall rates of maternal harms were low for both Trial of labour (TOL) and Elective repeat caesarean section (ERCS). While rare for both TOL and ERCS, maternal mortality was significantly increased for ERCS at 13.4 per 100,000 versus 3.8 per 100,000 for TOL. The rates of maternal hysterectomy, hemorrhage, and transfusions did not differ significantly between TOL and ERCS. The rate of uterine rupture for all women with prior caesarean is 3 per 1,000 and the risk was significantly increased with TOL (4.7/1,000 versus 0.3/1,000 ERCS. Women with a prior caesarean delivery had a statistically significant increased risk of placenta previa compared with women with no prior caesarean section. Perinatal mortality was significantly increased for TOL at 1.3 per 1,000 versus 0.5 per 1,000 for ERCS [5].
6. A study conducted in Australia in 2007, by university of Adelaide, Australia, on Birth after Caesarean study with objective of assessing women with previous caesarean birth and who were eligible in subsequent pregnancy for vaginal birth analysed whether vaginal birth after caesarean compared with planned repeat caesarean section affect the risk of serious complication for women and her infant. Its primary outcome was serious adverse infant outcome. A meta analysis Study by ACOG in 2008, on Maternal morbidity following a trial of labor after caesarean section vs. elective repeat caesarean delivery, concluded that TOL has a successful rate of 73%, and the incidence of maternal morbidity were similar in women experiencing a TOL and women choosing ERCs. Factors determining successful TOL were history of trial of labour in past, rupture of membrane at the time of admission, cervical dilatation of more than 3cm at the time of admission. Uterine injury occurs in 1.3% and 0.4% of women undergoing TOL and ERCS, respectively, and the risk of uterine lesions is 3-fold greater in patients planning TOL, compared with those undergoing ERCS. Additional interventions, in particular blood transfusion and hysterectomy, are per-formed with the same frequency in the two groups [6].
7. A study conducted by New England Journal of Medicine on Maternal and Perinatal Outcomes Associated with a Trial of Labor after Prior Caesarean Delivery, concluded that trial of labour is associated with greater perinatal risk than elective repeat caesarean delivery7.When VBAC was successful, uterine rupture/dehiscence occurred in 0 to 0.4%, whereas in women experiencing Failed TOL, uterine rupture/dehiscence ranged from 0% to 6.7%.18. Risk factors that have been associated with Failed TOL included the following: short interpregnancy interval, birth weight, no history of previous vaginal delivery, maternal diabetes, obesity, excessive weight gain patients with multiple prior caesarean deliveries, cephalo-pelvic disproportion, alcohol and cigarette use, and lesser degrees of cervical dilatation at admission [7].

Objective of the study

1. To know the maternal and fetal outcome in Trial of Labour after Caesarean Section and "Repeat Caesarean section.
2. To Compare the maternal and fetal outcome in Trial of Labour after Caesarean Section and Repeat Caesarean Section and to conclude which is safer for mother And fetus.

Material and methods

Methods of collection of data

A comparative study of women with term gestation with singleton pregnancy, who underwent one caesarean section after considering inclusion and exclusion criteria were included in this study. A total of 90 cases were selected either from the outpatient department (booked) or in labour room (unbooked). Booked cases were regularly followed up in the antenatal clinic and the un booked patients, who reported directly for labour, were then assessed for a trial of labour. Patient's were explained about TOL and repeat caesarean section, mode of delivery and their consequence and advantage. Those who were willing for TOL were allowed for vaginal delivery after informed and written consent and those who opted for caesarean section underwent repeat caesarean section.

The study population was divided into 2 groups, 45 ineach group: one group consisted of ERCS and the other group patients who underwent TOL. Demographic data, details of obstetric history, intrapartum events and postpartum events were recorded.

Neonatal data were collected till the hospital stay and

additional details were collected regarding clinical course of all neonates admitted to neonatal ICU.

Source of data
The data was collected from patients attending the labour room and outpatient department of Obstetrics and Gynaecology, Sri B M Patil Medical College Hospital and Research Centre, Bijapur.

Duration of study: 6 months
Inclusion criteria
1. Women with one previous lower segment caesarean section
2. Singleton pregnancy
3. Cephalic presentation
4. Term gestation

Exclusion criteria
1. Two or >Two caesarean sections
2. Teenage pregnancy
3. Previous uterine surgery like myomectomy
4. Estimated fetal weight >4 kg
5. Inter delivery interval <18 months
6. Classical section
7. Termination of pregnancy for anomalous baby

Statistical analysis
Sample size was calculated using the formula
n = z2 *P(l -P)ld 2*
n - sample size
z - statistics for a level of confidence
P - expected prevalence or proportion
d - precision

With 95% confidence level, anticipated prevalence of ERCS as 21% and anticipated prevalence of VBAC as 8% and desired precision as + 10%.

The minimal sample size for both group is 45and 45.
Continuous variables were compared with the use of the Wilcoxon rank-sum test and categorical variables with the use of the chi-square test or Fisher's exact test. Multivariate logistic-regression analysis was performed to adjust for potential confounding factors for the composite end point of the rate of maternal adverse events (transfuion, uterine rupture, hysterectomy, death, dehiscence, hemmoraghe and of neonatal adverse events at term (intrapartum stillbirth, hypoxic- ischemic encephalopathy and neonatal death). These possible confounding factors included maternal age at delivery, marital status, birth weight of the infant in the current delivery, prior vaginal delivery, and underlying medical disease. Nominal two-sided P value were reported. SAS software, version 20 (SAS Institute) were used for the analyses.

Results
Delivery
There were 1250 births during the study period. Among the 90 women who had a singleton gestation and a history of caesarean delivery, 45 underwent a trial of labor and 45 had an elective repeat caesarean delivery with indications for a repeated operation. Demographic and perinatal characteristics of women and infants in the two groups were not statistically significant.

Maternal complications
Maternal complications are presented in Table 1. There were 2 cases of uterine rupture among women who underwent a trial of labor (identified at the time of caesarean section). The rates of rupture were 1 of 2 (50 percent) for women with a prior low transverse incision, 1 of 2 (50 percent) for those with an unknown type of prior incision. Augmentation of labor with oxytocin and induction of labor, regard less of method, were associated with a significantly greater risk of uterine rupture than was spontaneous labor without the use of oxytocin (P<0.001 for both).
Maternal blood transfusion was significantly more common with a trial of labor than with an elective caesarean delivery. The frequencies of hysterectomy and maternal death were not significantly different between the two groups.
Infection and haemorrhage was not statistically significant m both groups. Maternal adverse events were more frequent among women who had an unsuccessful trial of labor than among women who had a successful vaginal delivery.

Table 1

Complication	Trial of Labor N=44	Elective Repeated Cesarean Delivery N=46	P Value
Uterine rupture	2(4.5°/o)	00(0°/o)	<0.001
Uterine dehiscence	13(29.5)	5(10.8)	0.03
Hysterectomy	00	00	00
Blood Transfusion	7(15.9)	2(4.3°/o)	<0.001
Maternal death	00	00	00
Infection	2(4.5°/o)	3(6.5°/o)	0.66
Hemorraghe	15(34°/o)	8(17.3°/o)	0.005

Maternal adverse events were more frequent among women who had an unsuccessful trial of labor than among women who had a successful vaginal delivery (Table 2).

Table 2

Complication	Failed Vaginal Delivery N=l2	Successful Vaginal Delivery N=32	P Value
Uterine rupture	2	00	<0.001
Uterine dehiscence	13	00	<0.001
Hysterectomy	00I	00	00
Blood ransfusion	4	3	0.05
Maternal death	00	00	00
Infection	2	00	0.005
Hemorraghe	9	6	0.003

Perinatal complications
Perinatal outcomes for term infants are presented in Table 2. The frequency of antepartum stillbirth was higher among the women who underwent a trial of labor than among the women who underwent elective repeated caesarean delivery. Among term infants, intrapartum and neonatal death rates were similar in the two groups.
The frequency of hypoxic-ischemic encephalopathy was significantly greater among the infants of women who

underwent a trial of labor at term than among the infants of women who had elective repeated caesarean delivery (8 vs. 0, *P*<0.001). Multivariate logistic regression analysis, with control for demographic factors and maternal disease, also revealed significant associations between a trial of labor and the risk of stillbirth, neonatal death, or hypoxic-ischemic encephalopathy in term infants, as compared with the risk among infants of women who had elective repeated caesarean delivery.

Table 3

Complication	Trial of Labor N=44	Elective Repeated Cesarean Delivery N=46	P Value
Antepartum stillbirth	05 (11)	01 (2.1)	<0.001
Intrapartum stillbirth	02 (4.5)	00	0.003
Hypoxic-ischemic encephalopathy	08 (18.1)	00	<0.001
Neonatal death	12 (27)	05 (10.8	0.005
Neonatal morbidity	16 (36.3)	11 (23.9)	0.002

The perinaal outcomes after uterine rupture in term pregnancies are presented in Table 4. Both the cases of term pregnancies with uterine rupture had an outcome of intrapartum stillbirth.

Table 4

Outcome	Term Pregnancies with Uterine Rupture N=2
Intrapartum stillbirth	2
Hypoxic- ischemic encephalopathy	0
Neonatal death	0
Admission to the neonatal intensive care unit	0
5-Minute Apgar score ≤5 16 (14.0)	0
Umbilical-artery blood pH ≤7.0	0

Discussion

Our data indicate that a trial of labor for women with a history of caesarean delivery is associated with an increased risk of adverse perinatal outcomes and a higher rate of maternal adverse events, as compared with elective repeated caesarean delivery. The magnitude of these risks is small; however, this information is important for women and health care providers who are making choices about the type of delivery. In the absence of randomized, controlled trials, most data used to inform women and health care providers about the choice between a trial of labor and caesarean delivery, after a previous caesarean delivery, have come from retrospective population based studies that used data from birth certificates or large retrospective multicenter or sir gle-institution cohort studies. Meta-analyses of these data have been limited by a lack of comparability between women undergoing a trial of labor and those undergoing elective repeated caesarean delivery [7, 8]

A primary consideration when counselling women is the perinatal morbidity and mortality that are directly attributable to uterine rupture. However, it is unclear from published studies how often uteriner upture results in perinatal death [9, 10].

Our study design involved abstraction of chart data for all cases of uterine rupture and confirmation by two separate review processes. Among 45 trials of labor patients and 2 ruptures, we found two neonatal deaths reflecting an overall rate of rupture-related perinatal death of 45 per 1000 trials of labor. A recent review of 880 maternal uterine ruptures during a 20-year period showed 40 perinatal deaths in 91,039 trials of labor, for a rate of 0.4 per 1000 [10]

An increased risk of uterine disruption may result from a plan of trial of labor with respect to elective repeat caesarean delivery. However, this increase may be counter balanced by reduction of maternal morbidity, uterine lesions, and hysterectomy when a trial of labor is successful. Thus, because in women attempting VBAC the higher morbidity rates are encountered in those who failed to achieve vaginal birth, many studies have concentrated on identification of risk factors for failure of a trial of labor to minimize the incidence of maternal complications [11].

Perinatal hypoxic brain injury is recognized as an under reported adverse outcome related to uterine rupture. Perinatal asphyxia has been poorly defined in studies of vaginal birth after caesarean delivery and variables such as cord-blood gas levels and Apgar scores are reported in only a small fraction of cases [6, 10].

We found a significant increase in the rate of hypoxic-ischemic encephalopathy related to uterine rupture among the children of women who underwent a trial of labor at term, as compared with the children of women who underwent elective repeated caesarean delivery (0.46 per 1000 trials of labor versus no cases, respectively).

The reported incidence of hypoxic-ischemic encephalopathy unrelated to uterine rupture at term in our study (8 cases in 44 trials of labor) is similar to an overall reported rate of 16 per 1000 births, which includes both trials of labor and elective caesarean sections [11].

In a study that did not document the type of prior delivery, Badawi and colleagues reported that elective caesarean delivery is associated with a reduced risk of encephalopathy in newborns, as compared with spontaneous labor(odds ratio, 0.17; 95 percent confidence interval,0.05 to 0.56) [11].

Although we observed no cases of hypoxic-ischemic encephalopathy after elective repeated caesarean delivery, it remains unclear whether having a scarred uterus affects the risk of this complication in women in labor who do not have uterine rupture. Previous data have suggested a trend toward a greater risk of fetal death among women who undergo a trial oflabor [6].

In our study, the overall rate of combined intrapartum stillbirth at term and neonatal death was significantly different in the two groups (9.8 per 10,000 in women undergoing trial of labor vs. l.7 per 10,000 in women undergoing elective repeated caesarean delivery). Our findings are not consistent with those of McMahon and colleagues, who also reported no increase in perinatal deaths at term among women undergoing a trial of labor [9].

With regard to the observed increased frequency of term antepartum stillbirths, some of these probably occurred after 39 weeks before the onset of labor and might have been avoided by a scheduled repeated operation. Alternatively, some of this increase might be due to the encouragement by care providers of a trial of labor.

It has generally been accepted that vaginal delivery is associated with lower maternal morbidity and mortality rates

than is caesarean section. In contrast to an earlier meta-analysis, 7 we found an increased risk of blood transfusion in women who underwent a trial of labor. The exclusion from the study of women who presented in early labor and subsequently underwent repeated caesarean delivery probably lowered the risk of these complications in the group of women undergoing elective repeated caesarean delivery. We confirmed that many of the excess adverse events accompanying a trial of labor are attributable to the failure of labor and the requirement for a repeated caesarean operation.[9]

Of women attempting vaginal delivery after prior caesarean delivery, the greatest risk of serious complications occurs in those in whom uterine rupture develops. This study shows that the risk of uterine rupture is increased with the induction of labor [12, 13].

Although increased maternal mortality after caesarean delivery, as compared with the rate after vaginal delivery, has been a consideration when pregnant women are counselled, the infrequency of death and of confounding variables such as maternal disease, and the classification of an operation as either an emergency or a nonemergency procedure, complicates comparisons of mortality. No maternal deaths were observed in both the groups [14].

Women who, on the advice of their physicians, choose to undergo a trial of labor have characteristics that are different from the characteristics of women who undergo elective repeated caesarean delivery and these differences might affect outcomes. Although we tried to control for some of these differences in our analysis, the decision by women or their physicians to select a trial of labor as opposed to a repeated caesarean delivery may have occurred in a systematic way, thereby affecting our findings. We also recognize that women who presented in advanced labor were classified as undergoing a trial of labor, despite their possible prior intention to have a repeated caesarean operation. Nonetheless, we limited our study group to women who were apparently eligible for either type of delivery, and we excluded women whose ultimate choice of a type of delivery could not be reasonably classified [14, 15].

Overall, our data suggest a risk of an adverse perinatal outcome at term among women with a previous caesarean delivery of approximately 1 in 1000 trials of labor (0.1 per 1000, a risk that is quantitatively small but greater than that associated with elective repeated caesarean delivery. We believe that these estimates of risk can be extrapolated to institutions with resources, similar to ours, that are available to provide a trial of labor [14] and along with other factors, will facilitate the counselling of women who have to make a choice between a trial of labor and elective repeated caesarean delivery after a prior cesarean delivery [15].

Conclusion

Trial of labor by women with a history of caesarean delivery is associated with an increased risk of adverse perinatal outcomes and a higher rate of maternal adverse events, as compared with elective repeated caesarean delivery.

Significant increase in the rate of hypoxic-ischemic encephalopathy related to uterine rupture among the children of women who underwent a trial of labor at term, as compared with the children of women who underwent elective repeated caesarean delivery.

Although several studies demonstrated an association between clinical factors, maternal characteristics and unsuccessful vaginal delivery after caesarean section, there is actually no evidence that such factors can be useful to predict outcomes in women attempting to deliver vaginally after a previous caesarean surgery.

References

1. Hamilton BE, Martin JA, Sutton PD. Births: preliminary data for Natl Vital Stat Rep. 2002-2003; 51:1-20.
2. Public Health Service. Healthy People 2000: national health promotion and diseaseprevention objectives: full report with commentary. W.-1shington, D.C.: Government Printing Office, 1990:378. (DHHS publication no. (PHS) 91-50212.)
3. Department of Health and Human Services. Healthy People with understanding and improving health and objectives for improving health. 2nd ed. Washington, D.C. Government Printing Office, 2010-2000, 1- 45.
4. Menacker F, Curtin SC. Trends in caesarean birth and vaginal birth after previous caesarean 1991-99. Natl Vital Stat Rep. 2001; 49:1-16.
5. Sachs BP, Kobelin C, Castro MA, Frigoletto F. The risks of lowering the cesarean delivery rate. N Engl J Med. 1999; 340:54-7.
6. Vaginal birth after cesarean (VBAC). Rockville, Md.: Agency for Health Care Research and Quality, March (AHRQ publication no. 03-E018.), 2003.
7. Mozurkewich EL, Hutton EK. Elective repeat cesarean delivery versus trial of labor: a meta-analysis of the literature from Aln J Obstet Gynecol, 1998-1999-2000; 183:1187-97.
8. Rageth JC, Juzi C, Grossenbacher H. Delivery after previous cesarean: a risk evaluation. Obstet Gynecol. 1999; 93:332-7.
9. McMahon MJ, Luther ER, Bowes WA, Olshan AF. Comparison of a trial of labor with an elective second cesarean section. NE ngl J Med. 1996; 335:689-95.
10. Chauhan SP, Martin JN Jr, Henrichs CE, Morrison JC, Magann EF. Maternal and perinatal complications with uterine rupture in 142, 075 patients whoattempted vaginal birthafter cesarean delivery: a i eview of the literature.Am J Obstet Gynecol. 2003; 189:408-17.
11. Badawi N, Kurinczuk JJ, Keogh JM, *et al*. Intrapartum risk factors for new Lom encephalopathy: the Western Australian case control study. BMJ. 1998; 317:1554-8.
12. Lydon-Rochelle M, Holt V, Easterling TR, Martin DP. Risk of uterine rupture duringlabor among women with a prior caesarean delivery. N Engl. J Med. 2001; 345:3-8.
13. Zelop CM, Shipp TD, Repke JT, Cohen A, Caughey AB, Lieberman E. Uterine ruptureduring induced or augmented labor ingravid women with one prior cesarean delivery. Am J Obstet Gynecol. 1999; 181:882-6.
14. Vaginal birth after previous cesarean delivery: clinical management guidelines for obstetricians-gynecologists. ACOG practice bulletin no. 5. Washington DC. American College of Obstetricians and Gynecologists, 1999.
15. Van Bogaert LJ. Mode of delivery after onecesarean section. Int. J Gyn: ecol0bstet. 2004; 87:9-13.