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Original Research Article

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

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ABSTRACT

Background: Globally, high rates of caesarean section (CS) are an issue of public health concern. For women who have had a previous caesarean, choices for mode of birth in their next pregnancy are either a trial of vaginal birth after caesarean (TOLAC) or an elective repeat caesarean delivery (ERCD). Both ERCD and TOLAC have benefits and risks associated.
Methods: A prospective comparative study was conducted in the Department of Obstetrics and Gynecology at SDM college of medical science and hospital, Dharwad, Karnataka, India. The study included 80 women with one previous lower segment caesarean section over a period of 1 year. A 40 women underwent TOLAC and 40 women had a repeat caesarean section. The maternal and fetal outcomes in trial of labour after caesarean delivery and repeat caesarean delivery were compared.
Results: In this study maternal morbidity was more common in ERCD group than in the TOLAC group. Neonatal outcome was the same in both the study groups.
Conclusions: In our study the TOLAC success rate was 70-80%, pregnant woman with one previous lower segment Caesarean section should be given the option of TOLAC, unless contraindicated.

Keywords: Elective repeat caesarean delivery (ERCD), Maternal outcome, Neonatal outcome, Trial of vaginal birth after caesarean (TOLAC)

INTRODUCTION

Caesarean section is one of the commonest operations performed on childbearing women, with rates continuing to rise worldwide. elective repeat caesarean delivery (ERCD) accounts for a large proportion of caesarean deliveries.[1] For women who have had a previous caesarean, the mode of birth in their next pregnancy is either a trial of vaginal birth after caesarean (TOLAC) or an elective repeat caesarean delivery (ERCD). For women who attempt a TOLAC, the chance of achieving vaginal birth has been variably reported between 56% to 80%.[1,2] The negative reports of an increase in the risk of maternal and infant complications related to TOLAC have dwindled the number of women attempting a TOLAC in many countries.[3,4] Both ERCD and TOLAC have associated benefits and risks. While ERCD is considered relatively low risk, it is associated with maternal and neonatal complications. The primary neonatal complication is respiratory morbidity, whereas maternal complications include placenta accreta, visceral injury, intensive care unit admission, hysterectomy, blood transfusion and a longer hospital stay.[5,6] Risks of planned TOLAC when compared with planned ERCD include endometritis, uterine rupture, perinatal death, and hypoxic ischaemic encephalopathy.[7] Advantage of

vaginal birth after caesarean section is shorter maternal hospitalization, less blood loss, fewer transfusions, fewer infections, and fewer thromboembolic events. Uterine rupture occurs in 1 per 1000 women undergoing TOLAC.[8] By comparison, women planning ERCD are at increased risk of surgical complications, risks of multiple caesareans and placenta accreta, and their infants are at risk of respiratory morbidity.[7] The aim of the present study was to compare the maternal and neonatal morbidity and mortality in women undergoing TOLAC or ERCD after a previous one caesarean section.

METHODS

A prospective comparative study was conducted between March 2016 and March 2017, in the department of Obstetrics and Gynecology at Shri Dharamshala Manjunatheshwara college of medical science and Hospital, Dharwad, Karnataka, India. All women were explained about trial of labour (TOL) and repeat caesarean section as modes of delivery, their advantage, risks and complications. Women who met the inclusion criteria and willing for TOL were allowed for vaginal delivery, caesarean section was performed on those who opted for ERCD. A 40 women opted for TOL and 40 women had repeat caesarean section. This study was approved by the research ethics committee of the college and a written and informed consent was obtained from the patients before the procedure.

Demographic data, details of obstetric history, intrapartum events, and postpartum events were recorded. neonatal data was collected till the hospital stay and additional details were collected regarding clinical course of all neonates admitted to neonatal ICU.

Inclusion criteria

- A total of 80 women with one previous caesarean section with singleton pregnancy, planning delivery were included in the study
- Inclusion criteria being women with one previous lower segment caesarean section, singleton pregnancy, cephalic presentation, term gestation with adequate pelvis.

Exclusion criteria

- Women with two or more caesarean sections, teenage pregnancy, previous uterine surgery like myomectomy, estimated fetal weight more than 4 kg, inter-delivery interval of less than 18 months, women with previous classical section or woman carrying anomalous baby were excluded from the study.

Statistical analysis

Data was rearranged and analysed using IBM software SPSS 20.0.

RESULTS

The two treatment groups were compared at the time of study entry.

Table 1: Baseline maternal characteristics.

Characteristics	TOLAC No. (%)	ERC No. (%)	Total No. (%)
Age group (years)			
20-25	19 (47.5)	7 (17.5)	26 (32.5)
26-30	13 (32.5)	25 (62.5)	38 (47.5)
31-35	8 (20.0)	7 (17.5)	15 (18.75)
>35	0	1 (2.5)	1 (1.25)
Educational status			
Illiterate	10 (25)	3 (7.5)	13 (16.25)
Primary School	0	0	0
Middle School	3 (7.5)	0	3 (3.75)
High School	13 (32.5)	7 (17.5)	20 (25)
Pre-University	3 (7.5)	10 (25)	13 (16.25)
Graduate	9 (22.5)	13 (32.5)	22 (27.5)
Post graduate	2 (5)	7 (17.5)	9 (11.25)
Socioeconomic status			
Class I	14 (35)	24 (60.0)	38 (47.5)
Class II	15 (37.5)	14 (35.0)	29 (36.25)
Class III	11 (27.5)	1 (2.5)	12 (15.2)
Class IV	0	1 (2.5)	1 (1.25)
Class V	0	0	0
Previous vaginal delivery			
Yes	27 (67.5)	38 (95.0)	65 (81.25)
No	13 (32.5)	2 (5.0)	15 (18.75)
Indication for primary caesarean section			
Ante partum haemorrhage	2 (5.0)	1 (2.5)	3 (3.75)
Breech	5 (12.5)	5 (12.5)	10 (12.5)
Fetal distress	9 (22.5)	9 (22.5)	18 (22.5)
Meconium stained liquor	6 (15.0)	5 (12.5)	11 (13.75)
Non-progression of labour	5 (12.5)	2 (5.0)	7 (8.75)
Oligohydramnios	6 (15.0)	5 (12.5)	11 (13.75)
Pre-eclampsia	1 (2.5)	5 (12.5)	6 (7.5)
Post date	1 (2.5)	1 (2.5)	2 (2.5)
Premature rupture of membranes	2 (5.0)	2 (5.0)	4 (5.0)
Transverse lie	3 (7.5)	2 (5.0)	5 (6.25)
Cephalopelvic disproportion	00	3	3 (3.75)
Gestational age (in weeks)			
37-37+6	7 (17.5)	9 (22.5)	16 (20.0)
38-38+6	10 (25.0)	17 (42.5)	27 (33.75)
39-39+6	16 (40.0)	13 (32.5)	29 (36.25)
≥40	7 (17.5)	1 (2.5)	8 (10.0)

In TOLAC group most people were in the age group of 20-25 years (47.5%), majority educated up to high school 13(32.5%) and 15(37.5%) belonged to upper middle class.

In ERCS group majority were 26-30 years old (62.5%), majority were graduates 13 (32.5) and 24 (60%) belonged to upper class. ERCS was performed at 38 to 38+6 weeks of gestation in 42.5% of the subjects, a total of 40 % of women were allowed for TOLAC at gestational age of 39 to 39±6 weeks. A 13(32.5%) in the TOLAC group had a previous vaginal delivery compared to 2(5%) women in the ERCS group. The most common indication for previous caesarean section was fetal distress accounting for 22% of cases in both the groups (Table 1).

Table 2: Details of labour and delivery in TOLAC group.

	Number	Percentage
Induced/ spontaneous		
Induced	5	12.5
Spontaneous	35	87.5
Stage of labour on admission		
Active	17	42.5
Latent	23	57.5
Mode of delivery		
Successful TOLAC	31	77.5
Failed TOLAC	9	22.5
Instrumental deliver		
Forceps	2	5
Vacuum	17	42.5
Reason for failed TOLAC		
Scar tenderness	5	-
Deep transverse arrest	2	-
Fetal distress (meconium stained liquor)	2	-

Majority of the women in the TOLAC group went into spontaneous labour at term, with 42% of them in active labour at the time of admission. Out of the 40 women, 31 had a successful TOLAC and 49.5% of them had an instrumental delivery. The success rate of TOLAC in this study was 77.5%.

A 9 women willing for trial of labour underwent emergency caesarean section, indication being suspected scar rupture in 5 women, fetal distress and deep transverse arrest in remaining 4 women (Table 2). In the 40 women belonging to the ERCS group, 42.5% had an uneventful repeat caesarean section. Adhesions were noted in 13 cases, bladder injury occurred in 1 case and silent scar dehiscence was noted in 2 cases (Table 3). Table 4 compares the maternal complications between the two groups. There is a statistically significant difference, more complications were seen in the ERCS group compared to the TOLAC group post-partum haemorrhage was seen in 3 patients who underwent repeat caesarean section, requiring blood transfusion or intravenous iron therapy.[1]

Table 3: Intraoperative complications in ERCS women.

Intra operative complications	ERCS No.	Percentage
Adhesions	13	32.5
Bladder injury	1	2.5
Bladder advancement	3	7.5
Haematoma	1	2.5
Meconium stained liquor	3	7.5
Scar dehiscence	2	5.0
No complication	17	42.5

Woman in the ERCS group had a bladder injury, perineal tear was seen in 2 women who had a TOLAC. The average hospital stay was 3.6 days in TOLAC group compared to an average of 5.6 days in the ERCS group. However, there were no maternal deaths in these two groups in this study.

Table 4: Comparison of maternal complications between the two groups.

Maternal complications	TOLAC No. (%)	ERC No. (%)	Total No. (%)	
Anaemia	1 (2.5)	4 (10)	5 (12.5)	P value-0.022 (<0.5)
Post-partum haemorrhage	1 (2.5)	3 (7.5)	4 (10)	
Urinary tract infection	1 (2.5)	2 (5)	3 (7.5)	
Febrile illness	3 (7.5)	3 (7.5)	6 (15)	
Blood transfusion	-	1 (2.5)	1 (2.5)	
Thromboembolic events	-	-	-	
Wound/episiotomy gaping	2 (5)	1 (2.5)	3 (7.5)	
Post dural puncture/headache	-	3 (7.5)	3 (7.5)	
Bladder injury	-	1 (2.5)	1 (2.5)	
Intravenous iron therapy	1 (2.5)	3 (7.5)	4 (10)	
Perineal tear	2 (5)	-	2 (5)	
Hospital stay(days)	3.6	5.6	-	

Table 5: Neonatal outcome in TOLAC and ERCS group.

	TOLAC No. (%)	ERC No. (%)	Total No. (%)	P value
Birth weight (kg)				
<2	1 (2.5)	0 (0)	1 (1.25)	0.190 (>0.05)
2.0-2.5	2 (5)	2 (5)	4 (5)	
2.6-3.0	18 (45)	17 (42.5)	35 (43.75)	
3.1-3.5	18 (45)	18 (45)	36 (45)	
3.5-4.0	1 (2.5)	2 (5)	3 (3.75)	
>4	0 (0)	1 (2.5)	1 (1.25)	
Apgar score (first 1 minute)				0.9 (>0.05)
<7/10	4(10)	5 (12.5)	9 (11.25)	
≥7/10	36 (90)	35 (87.5)	71 (88.75)	
Apgar score (after 5 minutes)				0.8 (>0.05)
<7/10	1 (2.5)	0	1 (1.25)	
≥7/10	39 (97.5)	40 (100)	79 (98.75)	
Respiratory distress				1 (>0.05)
Present	5 (12.5)	6 (15)	11 (13.75)	
Absent	35 (87.5)	34 (85)	69 (86.25)	
N. I. C. U. admission				0.4875(>0.05)
Yes	3 (7.5)	5 (12.5)	8 (10)	
No	37 (92.5)	35 (87.5)	72 (90)	

The average birth weight of babies born in both the groups was 2.6 to 3.5kgs, the Apgar scores, incidence of respiratory distress and number of babies requiring neonatal intensive care admission were comparable in both the groups (Table 5).

DISCUSSION

The caesarean section epidemic is a reason for immediate concern and deserves serious international attention. There has been a continuous rise in the caesarean rates and a 2011 study calculates that if trends continue, by 2020 the caesarean rate will be an alarming 56.2%. The reasons for increasing caesarean section rates are multifactorial but a recent analysis concluded that a practice of elective repeat caesarean section for women with previous caesarean section has been the major contributor to the escalation in the total caesarean section rate.

With the upcoming reviews and meta-analysis on TOLAC it will be a good option for reducing the incidence of repeat caesarean deliveries. With improved antenatal care, close labour monitoring and institutional delivery for a previous caesarean section, TOLAC is considered safer than repeat elective caesarean section in a carefully selected patient. The overall TOLAC rates described in literature is 56% to 80% whereas in our study it was 77%.[1,2]

Mishra et al, in their study have depicted that the most common indication of previous caesarean was breech followed by non-progress of labour, whereas breech presentation and fetal distress were important indications in this study.[9,10] Most of the women in the TOLAC group belonged to lower socioeconomic class, were school dropouts, 32% had a previous vaginal delivery and were more than 39 weeks of gestation in labour at time of admission. Women with previous vaginal delivery, gestational age less than 40 weeks with spontaneous labour increased the chances of successful TOLAC.[11,12]

The most common indication for a failed TOLAC in this study was suspicion of scar rupture. Fetal distress was the commonest indication for emergency repeat caesarean section as evident in different studies.[13,14] In this study involving women with a single prior caesarean, who did not have any contraindication for vaginal delivery, a plan to deliver by TOLAC was associated with a beneficial reduction in the maternal morbidity with no significant difference in the neonatal outcome between the two groups.

Evidence from the recent literature suggests that TOLAC does not increase the risk of hysterectomy or maternal mortality, in fact ERCD is associated with increased morbidity such as haemorrhage, blood transfusion and endometritis.[12,15] There were no cases of uterine rupture in this study. According to the literature review, the risk of uterine rupture is 50 per 10,000 for planned TOLAC and 2 per 10,000 for ERCS.[11] In our study, the surgical complications were few in women who had repeat caesarean section.

In ERCS risk of surgical complications is reported to be 0.1-2%, the reported incidence of adhesion development after primary caesarean section ranges from 27-45%,

incidence of bladder injury during caesarean section is relatively infrequent 0.08 to 0.94%.[11,16,17]

Increased risk of maternal death (13 per 100,000 vs. 4 per 100,000) was noted in ERCD group compared to planned TOLAC by Mithali Das et al, however there were no maternal deaths in this study.[11] There was no significant difference in the birth weight, APGAR score and perinatal morbidity in terms of respiratory distress and NICU admission in the two groups. Planned VBAC is associated with slightly (0.25%) increased perinatal risk than planned ERCS, although absolute risks are low for both modes of delivery.[11,13]

Few studies have reported higher NICU admissions in ERCD group compared to TOLAC group whereas in our study the difference in the two groups was not statistically significant.[11,18] Factors associated with an increased likelihood of successful TOLAC include history of prior vaginal delivery or TOLAC, non-recurring indication for prior caesarean delivery (e.g., malpresentation), and spontaneous rupture of the membranes or favorable cervix at the time of presentation.

Factors associated with a decreased likelihood of successful TOLAC include maternal obesity (BMI > 30 kg/m^2), gestational age more than 40 weeks, estimated fetal weight greater than 4,000 grams and induced labour.[7,19,20]

CONCLUSION

Decreased maternal and perinatal morbidity, coupled with high rates of TOLAC success (70%) and very low-risk of uterine scar rupture (0.5%), makes planned TOLAC an appropriate option for the majority of women with previous caesarean delivery. It should be attempted in settings where facilities for emergency caesarean section, anaesthesia and blood transfusion are available with continuous monitoring by a skilled professional. Above all, in addition to advocating TOLAC, we stress the importance of avoiding and reducing the primary caesarean section by good clinical practice, including use of the partograph, augmentation with oxytocin and instrumental vaginal delivery to reduce the escalating caesarean section rates.

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REFERENCES

1. Stone C, Halliday J, Lumley J, Brennecke S. Vaginal births after Caesarean (VBAC): a population study. Paediatr Perinat Epidemiol.2000;14:340-8.
2. Cowan RK, Kinch RAH, Ellis B, Anderson R. Trial of labor following cesarean delivery. Obstet Gynecol.1994;83:933-6.
3. Hamilton BE, Martin Ventura SJ. (2009) Births: preliminary data for 2007. Natl Vital Stat Rep.2009;57:1-23.
4. Landon MB, Hauth JC, Leveno KJ, Spong CY, Leindecker S, Varner MW, et al. Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. New England J Med. 2004;351(25):2581-9.
5. Edwards MO, Kotecha SJ, Kotecha S. Respiratory distress of the term newborn infant. Paediatr Respir Rev. 2013;14:29-37.
6. Sabol B, Denman MA, Guise JM. Vaginal birth after cesarean: an effective method to reduce cesarean. Clin Obstet Gynecol. 2015; 58:309-19.
7. Guise JM, Eden K, Emeis C, Denman MA, Marshall N. (2010) Vaginal birth after cesarean: new insights. Evid Rep Technol Assess.2010;191:1-397.
8. Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean birth. Green-top guideline. 2007(45).
9. Birara M, Gebrehiwot Y. Factors associated with success of vaginal birth after one caesarean section (VBAC) at three teaching hospitals in Addis Ababa, Ethiopia: a case control study. BMC Pregnancy Childbirth. 2013;13(1):31.
10. Mishra N, Taori N, Misri A. Fetomaternal outcome of pregnancy with previous caesarean section. J Evolution Med and Dent Sci. 2014;3(47):11369-78.
11. Das M, Varma R. Vaginal birth after caesarean section: a practical evidence-based approach. Obstetrics, Gynaecology Reproductive Med. 2012;22(7):177-85.
12. Cheng YW, Eden KB, Marshall N, Pereira L, Caughey AB, Guise J-M. Delivery After Prior Cesarean: Maternal Morbidity and Mortality. Clinics perinatol.2011;38(2):297-309.
13. Tripathi JB, Doshi H, Kotdawala PJ. Vaginal birth after one caesarean section: analysis of indicators of success. J Indian Med Assoc.2006;104:113-5.
14. Vardhan S, Behera RC, Sandhu GS, Singh A, Bandhu HC. Vaginal birth after caesarean delivery. J Obstet Gynecol India. 2006;56:320-3.
15. Homer C, Besley K, Bell J, Davis D, Adams J, Porteous A et al. Does continuity of care impact decision making in the next birth after a caesarean section (VBAC)? A randomised controlled trial. BMC Pregnancy Childbirth. 2013;13(1):140.
16. Tulandi T, Agdi M, Zarei A, Miner L, Sikirica V. Adhesion development and morbidity after repeat cesarean delivery. Am J Obstetr Gynecol. 2009;201(1):56.e1-56.e6.
17. Deline J, Varnes-Epstein L, Dresang L, Gideonsen M, Lynch L, Frey J. Low primary cesarean rate and high VBAC rate with good outcomes in an Amish birthing center. Annals Family Med. 2012;10(6):530-7.

18. Patel R, Jain L. Delivery After Previous Cesarean: Short-Term Perinatal Outcomes. Seminars Perinatol. 2010;34(4):272-80.
19. Bais JM, van der Borden DM, Pel M, Bonsel GJ, Eskes M, van der Slikke HJ, et al. Vaginal birth after caesarean section in a population with a low overall caesarean section rate. European J Obstetr Gynecol Reproductive Biol. 2001;96(2):158-62.
20. Doshi HU, Jain RK, Vazirani AA. Prognostic factors for successful vaginal birth after cesarean section-analysis of 162 cases. J Obstet Gynecol Ind. 2010;60(6):498-502.

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