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Research Article

Study of Trial of Labour after Caesarean Section (TOLAC)

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ABSTRACT

Introduction: Caesarean section is one of the most commonly performed major surgical procedures. Worldwide increase in caesarean section (CS) rate during the last three decades has been the cause for concern. As ours is a tertiary health care centre catering around 20,000 deliveries per year and patients with previous caesarean scar get referred from surrounding primary health centers in huge number. In order to reduce c-section rates, TOLAC are conducted as per departmental standard operative procedures and WHO standards. Objective: To study incidence of trial of labour after c-section, progress of labour in active phase, maternal and fetal outcome in cases of trial of labour after c-section at tertiary care center. **Methods**: Prospective Observational study in tertiary institute from october 2020- september 2022 in the department of obgy. Ethical approval was taken. 200 cases were studied after applying inclusion and exclusion criteria with CTG monitoring. **Results**: A total of 200 subjects with previous one cesarean section were studied. 71.50% underwent successful trial of vaginal birth (57.50 % vbac, 08.50 % vaccum and 05.50 % forceps) and 28.50% required cesarean section. Maximum number of women who had VBAC has LSCS (Lower Segment Caesarean Section) in the past for fetal distress(33%). LSCS (failed VBAC) was done maximally for fetal distress 37 (64.90%), then for failure to progress 15 (26.30%) and impending scar dehiscence 5 (08.80%). Maternal complications were lower in the VBAC group: fever (0.69%), blood transfusion (06.30 %). **Conclusion**: Success rate of TOLAC at our institute is 75 %.The study shows encouraging result for VBAC in a well facilitated set up to be followed to reduce Caesarean rate.

Key Words: *Scar tenderness, VBAC, TOLAC, CTG, lower segment caesarean section*

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INTRODUCTION

Cesarean section is one of the most commonly performed major surgical procedures[1]. Worldwide increase in cesarean section (CS) rate during the last three decades has been the cause for concern[2]. "Once A Cesarean Always A Cesarean" statement also contributed to rising trend of cesarean section [3].

This high cesarean section rate has put burden on the economy of nations and individuals and families [4]. Because of escalating rates of cesarean section, many suggestions were made that vaginal birth after cesarean section (VBAC) might help in reducing the rates of CS [5]. Because of increased risk of maternal complications with repeat cesarean section and safety of VBAC, trial of labor after cesarean section (TOLAC) for selected group of patients with previous scar has become a preferred strategy [6].

Trial of labor after cesarean (TOLAC) is the term for an attempted birth in a patient who has had a previous cesarean section. It may result in a successful VBAC (vaginal birth after cesarean) or a repeat cesarean section[7].

It is no longer an absolute practice to always opt for cesarean section once a patient underwent cesarean section. However, there is slightly increased risk of uterine scar rupture or scar dehiscence, when vaginal birth after cesarean section is attempted [8]. Although neither VBAC nor repeat C-Section is free of its own risks and the crucial issue is to ensure better maternal and perinatal outcomes [9]. Present study was aimed to assess the factors affecting trial of labour after one cesarean section and the feto-maternal outcome of TOLAC in our tertiary care hospital in uncomplicated and carefully selected cases of previous LSCS.

METHODOLOGY

This prospective observational study was carried out in the postgraduate department of gynaecology and obstetrics, at Government Medical College Hospital Aurangabad, conducted from October 2020 to September 2022. It is a tertiary care teaching hospital which caters for around 20,000 deliveries per year.

This study was conducted after getting permission from institutional ethical committee of Medical College. Proper counseling was done to the selected cases regarding risks and complications associated with TOLAC and also the benefits of VBAC. Written, valid and informed consent was taken. Specific inclusion and exclusion criteria were used to determine study eligibility**.**

INCLUSION CRITERIA:

Pregnant women, gestational age > 37 weeks with history of previous one lscs in spontaneouslabour admitted in labour room, non–recurrent indication in previous delivery, adequate pelvis, cephalic presentation, last child birth more than 2 years, willing for vaginal birth.

EXCLUSION CRITERIA:

History of Classical Cesarean, history of inverted T uterine incision, history of uterine rupture, contracted pelvis, twin gestation, macrosomia, shortened inter delivery interval, more than one previous c-section, previous h/o uterine surgery like myomectomy or hyterotomy, medical complications- heart disease, preeclampsia, eclampsia, Pregnant women with severe anemia, obstetrical complications – malpresentation, CPD.

Datawas collected regarding demographic data-Age, address, education, socio economic-status, present pregnancy history- Parity, gestational age [Gestational age is calculated from the time elapsed since the first day of the last menstrual period (Naegle's formula) or calculated from first-trimester ultrasonography if the last menstrual period was uncertain], booked or unbooked, antenatal visits, blood pressure at first visit, any warning symptoms(epigastric pain, headache, blurring of vision, nausea, vomiting) any treatment taken history was elicited. Previous pregnancy history-[history of previous LSCS, indication for index cesarean, type of index cesarean performed(elective, emergency)] ; Preexisting conditions (hypertension, diabetes etc.); Characteristics of second pregnancy (gestational diabetes, pre-eclampsia, eclampsia, premature rupture of membranes and birth weight); Interval between last and index pregnancy in months; Intrapartum and postpartum events were elicited and noted. Usg records were evaluated -scar thickness, myometrial invasion. General examination done- general physical condition, vitals – pulse rate(rate, rhythm, characteristics, radio-radial delay, radio-femoral delay) Blood pressure (checked on right arm in supine position), pallor, icterus. Systemic examination done in detail and noted.

Pelvic examination was done after taking consent from the patient in the receiving room who were willing to undergo trial of labour after cesarean section. On examination cervical dilatation, cervical effacement, condition of membranes, station, presentation and pelvis adequacy was noted and patient was assessed for TOLAC according to Standard Operating Procedures (SOP) of our institute.

In women undergoing TOLAC, in active labour were monitored with CTG and augmentation was done with inj oxytocin and artificial rupture of membranes. WHO modified partograph was recorded. A close one on one watch for early recognition of scar dehiscence was kept by identifying maternal tachycardia, vaginal bleeding, scar tenderness or fetal distress. Attempt at vaginal delivery abandoned if there was any suspicion of scar dehiscence, unsatisfactory progress of labour or fetal distress.

The labour was terminated by operative vaginal delivery (forceps/vacuum) or emergency LSCS according to dilatation of cervix and station of fetal head. Exploration of uterine scar after delivery for scar integrity was not done unless there was any signs and symptoms indicating rupture. Fetal examination was done for birth weight, trauma, nicu admission, asphyxia etc.

RESULTS

During the study period of two years, two hundred subjects consented for TOLAC, 143 (71.50%) underwent successful trial of vaginal birth and 57 (28.5%) required cesarean section.

Table 1: Distribution according to Age, Gestational age, Gravida and high risk factors

Age	Frequency (N=200)	Percentage (%)
19-25	106	53.00
26-30	60	30.00
31-35	29	14.50
>35	5	2.50

Gestational Age		
37.1-38	41	20.50
38.1-39	63	31.50
39.1-40	94	47.00
>40	2	1.00
Gravida		
2	143	71.50
3	40	20.00
4	11	5.50
5 & more	06	3.00
High risk factor		
Moderate Anaemia (Hb-7- 9 gm%)	24	16.66
Rh negative	48	33.33
Gestational hypertension	72	50.00

In the present study, the commonest age group of study participants was 19 to 25 years (53%) and mean age was 24.04±3.91 years. In the present study, majority of patients belongs to gestational age 39.1-40 weeks (47%) followed by 38.1-39 weeks (31.5%).In the present study, majority of patients with gravida 2 (71.50%) followed by gravida 3 (15%).In the present study, high risk factors among patients shows majority of patients had gestational hypertension (50%) followed by Rh negative (33.33%) and anaemia among 24 (16.66%) patients.

Table 2: Percentage of deliveries as per previous indication of LSCS:

PREVIOUS LSCS INDICATION	FREQUENCY(N=200)	PERCENTAGE
Fetal distress	66	33
Failure of induction	35	17.5
Oligohydramnios	35	17.5
Abruption	21	10.5
Breech	12	6
Eclampsia	10	5
PIH	08	4
Cord prolapse	05	2.5
CPD	04	2

Hand Prolapse	04	2

In the present study, indication for previous LSCS among patients shows majority of patients had fetal distress (33%) followed by oligohydroamnios and failure of induction (17.5%).

Table 3: Distribution according to periconceptional time period and FLAMM score.

Time duration (in yrs)	**Frequency (N=200)**	**Percentage**
<3	96	48
3.1-4	64	32
4.1-5	20	10
>5	20	10
FLAMM score	**N =200**	**Success rate**
4-5	44	21 (47.72%)
5-6	48	32 (66.67%)
6-7	108	100 (92.59%)

In the present study, time duration of last LSCS among patients shows majority of patients had duration of <3 years (48%).In the present study, mean FLAMM score for cesarean section was 3.66. If score 3-4, emergency cesarean section rate was (52.27%). If score 5-6, vaginal birth was 66.67 % compared to emergency cesarean section rate (33.33%). If score >6, emergency cesarean section rate was only 7.40%. Chances success of TOLAC was increased with increasing FLAMM score. (P = 0.001, Significant).

Table 4: History of previous vaginal birth:

No previous vaginal birth	**VBAC after LSCS**			**Vaginal birth prior to LSCS**		
	1	**2**	**3**	**1**	**2**	**3**
Number	26	2	0	28	6	1
Percentage(%)	92.85%	7.14%	00	80.0%	17.14%	2.85%

In the present study, history of previous vaginal among patients shows majority of patients had 1st VBAC after LSCS (92.85%) and vaginal birth prior to LSCS (80.00%)

Table 5: Duration of 2nd stage of labour and mode of delivery

Successful VBAC		
Mean ±SD	**Number**	**Percentage**
32.32 ±12.58 (Minutes)	143	71.50
Mode of delivery	**Number**	**Percentage (%)**
Instrumental **Forceps**	11	5.5

	Vacuum	17	8.5
Vaginal	**With episiotomy**	85	42.5
	Without episiotomy	30	15.0
C-Section		57	28.5
Total		**200**	**100**

In the present study, duration of 2nd stage of labour among patients with successful VBAC was **32.32 ±12.58** hours.

Table 6: CTG changes in failed TOLAC(n=57)

Indication	**Fetal tachycardia**	**Late decceleration**	**Variable decceleration**
Fetal distress (N=37)	28 (75.67 %)	05 (13.51%)	04 (10.81%)
Failure to progress (N15)	09 (60.00 %)	03 (20.00 %)	03 (20.00%)
Impending scar Dehiscence (N=5)	04(80.00%)	01(20.00%)	-
Total	**41(71.92 %)**	**09(15.78%)**	**07(12.28%)**

In the present study, most common CTG change in failed TOLAC was fetal tachycardia (71.92%) and late deceleration (15.78%) followed by variable deceleration (12.28 %).

Table 7: Significant findings noted during c-section

Findings	**Number (n=28)**	**Percentage**
Thinning	13	46.42%
Hematoma	06	21.42%
Dehiscence	05	17.85%
Rupture	04	14.28%

In the present study, significant findings noted during LSCS was majority were having thinning (46.42%) followed by hematoma (21.42%), impending scar dehiscence (17.85%) and rupture (14.28%)

Table 8: Maternal complications among patients:

Complications	**Successful VBAC (N=143)**	**Failed VBAC (n=57)**	**P value**
Fever	01 (0.69 %)	05 (8.70%)	<0.01 (S)

Mean Hospital stay	3.18 ±1.92	8.92 ±2.18	<0.01 (S)
Breast feeding problems	00	11 (19.3%)	<0.01 (S)
Blood transfusion	09 (6.3%)	11 (20.75%)	<0.01 (S)
Wound infection	01 (0.69 %)	05 (8.70%)	<0.01 (S)
PPH	01 (0.69%)	1 (0.18%)	0.31 (NS)
Gaped episiotomy	01 (0.69%)	00	<0.01 (S)

In the present study, out of 143 patients with successful VBAC had complication of fever was less 01 (0.69%) as compared to failed VBAC. This difference was found strongly significant among two groups. Mean hospital stay in failed VBAC was more 8.92 ±2.18 days compared to successful VBAC with significant difference (P<0.05). Breast feeding problems in failed VBAC was more 11 (19.3 %) compared to successful VBAC with no breast feeding problem. This difference was found strongly significant among two groups. There was significant difference between failed VBAC and successful VBAC in wound infection.

Table 9: COMPARISON BETWEEN NEONATAL COMPLICATIONS:

Parameters		**SUCCESSFUL VBAC (n=143)**	**FAILED VBAC (LSCS) (n=57)**	**P value**
BABY WEIGHT	**<2.5**	43	2	**<0.01 (S)**
	2.5-3.0	72	22	
	3.0-3.5	28	33	
APGAR SCORE at 5 min	**<3**	01	00	**0.32 (NS)**
	4-8	12	03	
	>8	130	54	
RESUSCITATION REQUIRED	**Yes**	07	17	**<0.01 (S)**
	No	136	40	
NICU ADMISSION	**Yes**	19	19	**<0.01 (S)**
	NO	124	38	
INDICATION FOR NICU ADMISSION	**MAS**	06	03	**0.05 (NS)**
	RDS	03	01	
	Hypoxia	04	03	
	Other	6	12	

In the present study, In The present study, comparison of foetal outcome among successful and failed VBAC showed more birth weight in failed VBAC compared to successful VBAC. This difference was found strongly significant among two groups. More resuscitation, NICU admission required among failed VBAC compared to successful VBAC. This difference was found strongly significant among two groups.

DISCUSSION

The present prospective observational Cohort study was conducted to for clinical study of maternal and fetal outcome in cases of trial of labour after cesarean section (TOLAC) at tertiary health care centre. The study was conducted after obtaining the permission from the institution ethics committee in the dept. of Obstetrics and gynaecology from October 2020 to October 2022 and after applying the inclusion and exclusion criteria women were selected for this study. A total of 200 full term pregnant women fulfilling the inclusion criteria and willing to participate in the study was selected for the study and patient was monitored for progress of labour by partograph. The data collection was done by using predesigned pretested questionnaire. A detailed history of patients and clinical examination along with relevant laboratory investigations were done after giving informed consent by the patient.

In the present study, during the study period of two years, two hundred subjects consented for TOLAC, 143 (71.5 %) underwent successful trial of vaginal birth and 57 (28.5) required cesarean section. Asha Neravi et al[10] studied observed the success rate of TOLAC as 77.5%.Tarini Singh et al[11] study on the outcome of a trial of labour after cesarean (TOLAC) observed 78.33% of cases had a successful TOLAC i.e vaginal birth after cesarean (VBAC) and 21.67% underwent a repeat emergency LSCS for failed TOLAC. In Rajshree Shahu et al[12] study 75 patients had

undergone trial of labour after caesarean 40 % patients had successful vaginal delivery whereas 60% had emergency caesarean section which is very less than present study. In the present study, the commonest age group of study participants was 19 to 25 years (53%) and mean age was 24.04±3.91 years.

In the present study, majority of patients belongs to gestational age 39.1-40 weeks (47%) followed by 38.1-39 weeks (31.5%) and gravida 2 (71.5%) followed by gravida 3 (15%).In the present study, high risk factors among patients shows majority of patients had gestational hypertension (50.00 %) followed by, Rh negative (33.33%) and moderate anaemia among (16.66%) patients. The indication for previous LSCS among patients shows majority of patients had fetal distress (33%) followed by oligohydroamnios and failure of induction (17.5%) which is comparable to Asha Neravi et al[10] study where most common indication for previous cesarean section was fetal distress accounting for 22% of cases. In the present study, history of previous vaginal birth among patients shows majority of patients had 1st VBAC after LSCS (92.85%) and vaginal birth prior to LSCS (80.00%) andtime duration of last LSCS among patients shows majority of patients had duration of < 3 years (48%). The mean FLAMM score for cesarean section was 3.66. If score 3-4, emergency cesarean section rate was (52.27%). If score 5-6, vaginal birth was 66.67 % compared to emergency cesarean section rate (33.33%). If score >6, emergency cesarean section rate was only 7.40%. Chances success of TOLAC was increased with increasing FLAMM score. (P = 0.001, Significant). In the present study, most common CTG change in failed TOLAC was fetal tachycardia (71.92%) and late deceleration (15.78%) followed by variable deceleration (12.28 %).In the present study, most common indication of emergency cesarean section was fetal distress (64.9%) and Failure to progress of labour (26.3%) followed by impending scar tenderness (8.8%) which is in accordance with Tarini Singh et al[11], Vardhan Shakti et al [13] and Chhabra S et al [14] studies on the outcome of a trial of labour after cesarean (TOLAC) observed 4 /13 (30.76%), 99 (41.7%) and 77%women who had fetal distress /fetal heart rate abnormality as the indication for cesarean section respectively. The present study showed significant findings during LSCS as majority were having thinning (46.42%) followed by hematoma (21.42%), impending scar dehiscence (17.85%) and rupture (14.28%). In the present study, out of 143 patients with successful VBAC had complication of fever was less 01 (0.69%) as compared to failed VBAC. This difference was found strongly significant among two groups. Breast feeding problems in failed VBAC was more 11 (19.3 %) compared to successful VBAC with no breast feeding problem. This difference was found strongly significant among two groups.

In the present study**,** there were 8.39% of babies with NICU admission and 4.90% neonates resuscitated. The comparison of foetal outcome among successful and failed VBAC showed more birth weight in failed VBAC compared to successful VBAC. This difference was found strongly significant among two groups. More resuscitation, NICU admission required among failed VBAC compared to successful VBAC. This difference was found strongly significant among two groups.

When to attempt VBAC is a major decision and should be based on careful patient selection after counseling, estimation of patient's risk of uterine rupture and strict adherence to the guidelines and considering the facilities for immediate surgery if need arises. Therefore, it is now safe to say that 'once a cesarean section, always a hospital delivery'[15].

CONCLUSION

The success rate observed in TOLAC cases was 71.50%. The common predictors of successful VBAC found in the present study were history of previous successful VBAC, High FLAMM score, spontaneous onset of labour and average baby weight. The present study shows that trial of labour after cesarean section in properly selected patients is relatively safe, provided TOLAC should be conducted in an institution under constant supervision and termination by cesarean section when need arises. Stringent selection criteria and one to one intra-partum monitoring with CTG for TOLAC often leads to successful VBAC. Trial of labour after cesarean section in indicated women should be encouraged with careful monitoring and documentation.We declare that there is no conflict of interest regarding the publication of this paper.

ABBREVIATIONS:

TOLAC-Trial of labor after cesarean, VBAC-Vaginal birth after cesarean section, WHO-World Health Organization, CPD- Cephalo-Pelvic Disproportion, CS-Cesarean section, LSCS-Lower Segment Cesarean Section, NICU- Neonatal intensive care unit, SOP-Standard Operating Procedure, CTG- Cardiotocography

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Authors' contributions: Dr. VSP developed the study proposal, managed the research implementation, data collection, analyzed data and wrote the manuscript. Dr. AAS developed the study proposal, assisted with data analysis and reviewed the manuscript. Dr. RAG participated in development of the study proposal, participated in research team meetings to monitor study progress, reviewed preliminary results and reviewed the manuscript. Dr. SNG assisted with development of the study proposal, reviewed preliminary results and reviewed the final manuscript. All authors have read and approved the manuscript.

REFERENCES

1. American College of Obstetricians and Gynaecology (ACOG)(2004). ACOG Practice Bulletin: vaginal birth after previous caesarean delivery: Clinical management guidelines. Int J Gynecol Obstet; 54:197-204
2. Lumbiganon P, Laopaiboon M, Gulmezoglu AM, Souza JP, Taneepanichskul S, Ruyan P, et al(2010). Method of delivery and pregnancy outcomes in Asia: the WHO global survey on maternal and perinatal health 2007–08. Lancet; 375(9713):490–9. 10.1016/S0140-6736(09)61870-5 [PubMed] [CrossRef] [Google Scholar]
3. Ugwumadu A (2005). Does the maxim "Once a Caesarean,always a Caesarean" still hold true? PLoS Med 2(9): e305
4. Sachdeva S, Nanda S, Sachdeva R(2013). Birth audit. J Nat SciBiol Med; 4(1):155-9.
5. Mafatlal SJ, Narendrabhai MM(2009). Analysis of mode of delivery in women with previous one caesarean section. J ObstetGynecol India; 59(2):136-9.
6. Birara M, Gebrehiwot Y(2013). 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; 13:31
7. Wikipedia definition.
8. Basic, E., Basic-Cetkovic, V., Kozaric, H., & Rama, A. (2012). Ultrasound evaluation of uterine scar after Cesarean section and next birth. Medical Archives, 66, 41.
9. Ananthalakshmi Paga1, D. AmithaKumari; Trial of Labour after Caesarean Delivery and its Outcome in a Teaching Hospital; www.ijcmr.com
10. Neravi A, Kulkarni N, Brindhini MU, Udayashree V(2019). A comparative study of maternal and fetal outcome in trial of labour after caesarean delivery and elective repeat caesarean delivery. Int J Reprod Contracept Obstet Gynecol; 8:1171-6.
11. Singh T, Thapa A, Rana P, Rauf SR, Shapoo MS, Aggarwal S, Maji D(2022). A study on the outcome of a trial of labour after cesarean (TOLAC) with one previous caesarean delivery. The New Indian Journal of OBGYN; 9(1): 46-51.
12. Sahu R, Chaudhary N, Sharma A(2018). Prediction of successful vaginal birth after caesarean section based on Flamm and Geiger scoring system a prospective observational study. International Journal of Reproduction, Contraception, Obstetrics and Gynecology; 7(10):3998-4003.
13. Vardhan S, Behera RC, Sandhu GS, Singh A, Bandhu HC(2006). Vaginal birth after caesarean delivery. J ObstetGynecol India; 56(4): 320-3.
14. Chhabra S, Arora G(2006). Delivery in women with previous caesarean section. J Obstet Gynaecol India; 56: 304-7.
15. Rozenberg P, Goffinet F, Phillippe HJ, Nisand I(1996). Ultrasonographic measurement of lower uterine segment to assess risk of defects of scarred uterus. Lancet; 347:281–4.