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Predictors Of Successful TOLAC : A Prospective Study At A Tertiary Care Hospital In North India

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ABSTRACT:
Objective - To predict the success of TOLAC in patients with previous LSCS in a tertiary care hospital in north India.

Background - As a result of improvements in obstetric care, vaginal birth after Caesarean section (VBAC) is recommended as a relatively safe way of decreasing the ever rising rate of Caesarean delivery globally. It is associated with fewer risks, requires less anaesthesia, poses a lower potential for postpartum morbidity, involves a shorter hospital stay, is more affordable, and encourages earlier and better bonding between mother and infant.

Methodology - This is a prospective interventional study, in which 400 patients were enrolled . 30 patients were lost to follow up. Thus, 370 patients were included in this study. It was conducted at GSVM medical college, Kanpur from August 2022 to July 2023 in all pregnant women attending antenatal clinic or the labour room with previous one or previous 2 LSCS.

Results - A total of 370 patients were included in this study, of which 230 underwent successful VBAC which makes
a success rate of 62.16%. 290 patients had history of previous 1 LSCS, among which 218 (75.17%) had successful VBAC. 166 of them went into spontaneous labour and 52 of them were induced using either mechanical method or oxytocin.

Conclusion - With vigilant monitoring and under supervision of senior obstetrician and paediatrician, TOLAC can be a better option to reduce the chances of repeat elective LSCS , thus reducing the maternal morbidity and mortality.

Keywords -*TOLAC, VBAC, Previous LSCS, Vaginal delivery*

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I. INTRODUCTION:

Rising rates of caesarean section (CS) is an issue of particular concern in the global maternity care field[1] due to the increased adverse maternal and neonatal outcomes associated with CS[2-5]

As caesarean birth rates continue to rise, more women are facing a choice between planning a vaginal delivery or a repeat caesarean birth after a previous caesarean section. In 1985, the World Health Organization (WHO) suggested that there are no additional advantages of CS above a rate of 10–15%[6-10]. CS rates are increasing in both resource-intense and resource-poor countries; however, of concern is the variation in CS rates internationally.

It was the result of the 1980 National Institutes of Health Consensus Conference on Caesarean Childbirth held in response to the three-fold increase in the rate of caesarean deliveries (from 5% in 1970 to 15.2% in 1978) that vaginal birth after caesarean (VBAC) came into being[11]. As a result, the VBAC rate rose from 19.9% in 1990 to 28.3% in about a decade and the caesarean delivery rate decreased from 22.7% to 20.7%[12]

As a result of improvements in obstetric care. it is now relatively safe for an attempt at vaginal birth after Caesarean section (VBAC). VBAC is thus being recommended as a relatively safe way of decreasing the ever rising rate of Caesarean delivery globally.[13,14] Vaginal delivery is associated with fewer risks, requires less anaesthesia, poses a lower potential for postpartum morbidity, involves a shorter hospital stay, is more affordable, and encourages earlier and better bonding between mother and infant.[15]

Successful vaginal birth has been reported in 60%–80% of cases reported in published studies of women attempting VBAC. Trial of labour after caesarean is defined as the plan to attempt labour when a woman has had a previous caesarean birth, with the goal of achieving a successful vaginal birth.

VBAC offers distinct advantages over repeat caesarean section, since the operative morbidity and mortality are completely eliminated, the hospital stay is much reduced, and the expenses involved are much less.[16]

There are numerous factors such as maternal age, body mass index (BMI), gestational age, spontaneous or induced labour, interconception period, estimated fetal weight, Bishop's score, type of previous caesarean scar, and indication for primary caesarean delivery, which can influence the decision to undergo a trial of labour after caesarean (TOLAC) and its outcome i.e. failed VBAC (emergency repeat caesarean section) or successful VBAC (vaginal delivery).

The rate of caesarean section needs to be reduced and this can be achieved to a small extent by avoiding a primary caesarean section done without explicit indications and more importantly, by resorting to a trial of vaginal delivery after previous caesarean section, which is safe for the fetus.[17,18]

II. Materials and Methods:

Study centre:

This study was conducted at GSVM medical college, Kanpur in the department of obstetrics and gynaecology. This is a tertiary care hospital and it is a major referral centre for all the district hospitals of Kanpur.

Study period:

This study was done from August 2022 to July 2023 over a period of 12 months.

Study design:

This is a prospective interventional study, conducted at GSVM medical college, Kanpur in the department of obstetrics and gynaecology.

Sampling:

This study was done in all pregnant women attending antenatal clinic or the labour room with previous one or previous 2 LSCS.

Booked patients were regularly followed up in the antenatal clinic and the referred or unbooked patients who directly reported in the labour room were assessed for trail of labour after councelling and taking the written and informed consent.

Sample size was calculated by using the formula : $N = 4\ PQ/E^2$

N - Number of patients

P - prevalence (from previous studies)

Q - 100-P

E- Error (5%)

Thus, total number of patients enrolled for the study were 400 of which 30 patients were lost to follow-up and 370 patients were finally included in the study.

Inclusion criteria:

1. All patients singleton pregnancy , vertex presentation with previous 1 or previous 2 LSCS with adequate pelvis.
2. Age between 19-35 years.
3. Previous non recurrent indication for LSCS.

Exclusion criteria:

1. Age <18 years or >35 years.
2. Intrauterine fetal demise.
3. Malpresentation.
4. Non reassuring fetal status.
5. Antepartum haemorrhage.
6. Placenta accreta syndrome (PAS) in present pregnancy.
7. History of myomectomy.
8. History of previous rupture uterus.
9. Previous history of classical or inverted T shaped incision.
10. Estimated fetal weight >3.5kg.

Data Collection:

Data collection was achieved using a proforma. All cases and their close relatives were explained about the advantages of vaginal birth over elective CS. They were also explained about the risk of scar dehiscence and the need for emergency CS, if trial of vaginal delivery failed.

All booked patients were asked to come for regular antenatal checkups and were advised to plan their delivery in our hospital. Hematological and serological investigations and obstetric sonography were performed during antenatal visits. The women were advised to get admitted in the ward as soon as she experiences labour pain. After ruling out the exclusion criteria, examining the patient and calculating the bishop's score, a decision regarding VBAC was taken by a senior obstetrician in the labour room.

The cases selected for VBAC were monitored carefully during labour by continuous electronic fetal monitoring. All the cases were provisionally prepared for emergency CS. Intrapartum monitoring was done by using the standard partograph of the World Health Organization (WHO). Four-hourly internal examinations were performed to assess the progress of labour and to detect impending signs of scar dehiscence or rupture. The trial of vaginal delivery was continued till there was satisfactory progress. In patients with unsatisfactory progress of labour, any sign of scar tenderness or fetal distress, emergency repeat caesarean section was performed. Patients who underwent successful VBAC were discharged in 48 hours and those who underwent emergency LSCS were discharged on post op day 4 in satisfactory condition.

Statistical analysis:

The data was analysed using SPSS version 22.0. Chi-square test and fisher test was applied . P-value less than 0.05 was considered statistically significant.

III. Result:

A total of 370 patients were included in this study, of which 230 underwent successful VBAC which makes a success rate of 62.16%.

Out of 370 patients who reported to the labour room, 80 patients had history of previous 2 LSCS , of which 12 patients underwent successful VBAC. 290 patients had history of previous 1 LSCS, among which 218 had successful VBAC. 166 of them went into spontaneous labour and 52 of them were induced using either mechanical method or oxytocin.

Out of 230 successful VBAC candidates, the maximum no. of patients were in age group of 25-29 years. Of 188 patients who fell in this age group, 144 underwent successful VBAC which makes it 62.61%. Age was a significant difference between successful VBAC and failed TOLAC. In addition, women with age ≥30 years were significantly more likely to have failed TOLAC than successful VBAC.

The percentage of < 25, 25-30, and > 30 BMI was 21.74%, 62.61%, and 15.65% in successful VBAC and 47.14%, 32.86%, and 20.00% in failed TOLAC, respectively. BMI was significantly different between successful VBAC and failed TOLAC.

Parity was not significantly different in the two groups.

The percentage of < 37 , 37-40 , and > 40 Period of gestation (in weeks) was 37.39%, 60.00%, and 2.61% for successful VBAC and 52.86%, 42.86%, and 4.29% for failed TOLAC, respectively. Period of gestation was significantly different in between successful VBAC and failed TOLAC .(table 1)

Patients with successful VBAC are significantly younger, had less weight and body mass index, and admitted in active phase cervical dilatation, compared to those who had failed TOLAC.

Table 1: Association of baseline characteristics of the women between Successful VBAC and Failed TOLAC

		Total	**Successful VBAC (n=230)**		**Failed TOLAC (n=140)**		[1]p-Value
			n	%	n	%	
Age (years)	≤19	6	0	0.00	6	4.29	<0.001*
	20-24	90	62	26.96	28	20.00	
	25-29	188	144	62.61	44	31.43	
	30-34	60	10	4.35	50	35.71	
	≥35	26	14	6.09	12	8.57	
BMI (Kg/m^2)	<25	116	50	21.74	66	47.14	<0.001*
	25-30	190	144	62.61	46	32.86	
	>30	64	36	15.65	28	20.00	
Parity	2	100	64	27.83	36	25.71	0.625
	3	128	84	36.52	44	31.43	
	4	70	44	19.13	26	18.57	
	>4	72	38	16.52	34	24.29	
Period of gestation (in weeks)	<37	160	86	37.39	74	52.86	<0.001*
	37-40	198	138	60.00	60	42.86	
	>40	12	6	2.61	6	4.29	

*=Significant, [1]=Chi square

Table 2 shows the relationship between the indication for a previous caesarean section and the outcome of the pathway between successful VBAC and failed TOLAC in the current pregnancy. Foetal distress was significantly higher in successful VBAC (34.78%) than in failed TOLAC (14.29%). The CPD, breech and transverse presentation, Nonprogress of labour oligohydromnios, prolonged PROM, multiple pregnancy, failed induction of labour, and cord prolapse did not differ significantly between successful VBAC and failed TOLAC.

Table 2: Association of indication of previous cesearean section and outcome of trail between Successful VBAC and Failed TOLAC in present pregnancy

Indication of previous LSCS	**Successful VBAC (n=230)**		**Failed TOLAC (n=140)**		**[1]p-Value**
	N	%	n	%	
Fetal distress	80	34.78	20	14.29	0.004*
CPD	40	17.39	30	21.43	0.627
Breech Malpresentation	20	8.70	10	7.14	0.922
Transverse Malpresentation	4	1.74	10	7.14	0.141
Non progress of labour	36	15.65	16	11.43	0.560
oligohydromnios	8	3.48	2	1.43	0.714
Prolonged PROM	6	2.61	10	7.14	0.272
Multiple gestation	2	0.87	4	2.86	0.661
Failed induction of labour	32	13.91	32	22.86	0.174
Cord prolapse	2	0.87	6	4.29	0.304

*=Significant, [1]=Chi square

Table 3 shows the mode of delivery among all patients undergoing trail of labour. 230 out of 370 patients underwent vaginal delivery in which 44(11.89%) patient required instrumentation.

Table 3: Distribution of women according to mode of delivery

		n	%
Mode of delivery	Vaginal delivery	186	50.27
	Repeat LSCS	140	37.84
	Vaginal instrumental delivery	44	11.89

Table 4 shows the association between maternal and perinatal outcomes in patients who underwent successful VBAC and failed TOLAC. NICU was significantly higher in failed TOLAC (32.86%) than in successful VBAC (13.91%). PPH was also significantly higher in failed TOLAC (25.71%) than in successful VBAC (12.17%). Uterine rupture was not noted in any of the women, while peripartum hysterectomy occurred in only two cases in the group of women with failed TOLAC.

Table 4:Association of maternal and perinatal outcome in patients undergoingbetween Successful VBAC and Failed TOLAC

OUTCOME	**Successful VBAC (n=230)**		**Failed TOLAC (n=140)**		[1]p-Value
	n	%	n	%	
NICU admission	32	13.91	46	32.86	0.004*
Uterine rupture	0	0.00	0	0.00	-
PPH	28	12.17	36	25.71	0.031*
Peripartum hysterectomy	0	0.00	2	1.43	0.802

*=Significant, [1]=Chi square

IV. Discussion:

With the significant rise in the incidence of primary CS for various indications, an increasing proportion of the pregnant women coming for antenatal care, report with a history of a previous CS.

Successful TOLAC leading to VBAC has a rate between 60-80% according to American College of Obstetricians and Gynecologists[19].

In the Royal College of Obstetrics and Gynecology (RCOG) guidelines, the success rate of planned VBAC is specified at 72-75%[20].

In the present study, the maximum number of patients who underwent successful VBAC fall in age group 25-29 years which contributes to 38.91% of the total patients. It was similar to a study conducted by **Bangal V B et al(2013)** where the maximun percentage of cases were in the age group 21-30 years.

Srinivas et al[21] found that women aged 15-20 years of age were 27% less likely to have a failed VBAC and women >35 years of age were more likely to experience an unsuccessful trial of labour.

In our study, following predicting factors were associated with successful VBAC : previous vaginal delivery before LSCS, previous VBAC, higher bishop score, fetal malpresentation ,fetal distress (80%) and oligohydroamnios (80%) as an indication for previous LSCS.The factors which were associated with unsuccessful VBAC are obesity ,advanced maternal age ,prolonged PROM, malpresentation and multiple gestation or labour induction as the indications for previous CS.

Understanding the influences of factors on VBAC could provide sufficient evidence to assess chances for achieving a successful vaginal delivery among womenwith prior CS. It also could help the clinician provide evidence-based counseling about VBAC, which has important implications on avoiding repeated CS.[22]

Juhasz et al[23]showed the evidence that success rate was 83.1% and 68.2% when BMI was less than 19.8 and > 29 respectively. In our study, maximum successful VBAC (38.91%) occurred in BMI between 25-30 $kg/m^{2.}$ As the BMI increased, success rate of VBAC decreased.

In our study we found that second, third and fourth gravida have more chances of successful VBAC compared to those with higher parities. **Sinha s et al[24]** ,in their study showed that third, fourth, fifth gravida had maximum chances of successful VBAC, while second gravida had less chances of successful VBAC. **Kraiem et a**l[25] studied 352 women undergoing TOLAC and found that gravida ≥ 3 increased significantly the probability of success of VBAC.

In our study, the maximum successful VBAC rates were in patients who underwent trail of labour between 37-40 weeks of gestation which is similar to that as seen in the study by S**inha S et al[24.]**

In our study, total of 78 newborns whose mothers were given trail of labour were admitted in NICU and all of them were discharged in satisfactory condition and there was no perinatal mortality.

Phelan *et al.*[26] in his study of 1,796 cases, reported a perinatal mortality of4.5/1,000 deliveries. It was observed that the success rate of VBAC depends on the birth weight of the baby. The success rate of VBAC decreased (18.7%) significantly when the birth weight was more than 3000 g.

V.Conclusion:

It remains a challenge to strike a balance between concern for safety and the need to decrease Caesarean section rates. Due to limited facilities for fetal monitoring, most obstetricians tend to have a low threshold for elective repeat Caesarean section; hence, only about half of women with a previous Caesarean are allowed forattempting sa trail of labour. But, with vigilant monitoring and under supervision of senior obstetrician and paediatrician, TOLAC can be a better option to reduce the chances of repeat elective LSCS , thus reducing the maternal morbidity and mortality.

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