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Comparison of maternal and neonatal outcomes following TOLAC (Trial of labour after caesarean) vs. ERCS (Elective repeat caesarean section) in post-caesarean pregnancies: A prospective study

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Abstract
Methods: A prospective study was carried out in the Department of Obstetrics and Gynecology at Government Thiruvannamalai medical college, Tamil Nadu from July 2019 to July 2020.
288 patients were included in the study who had previous one caesarean section. Out of this, 180 patients underwent elective caesarean section .108 cases fulfilled the TOLAC criteria and were given trial of labour. 62 patients had successful vaginal delivery. 46 had failed trial and underwent Emergency LSCS.
Results: In this study VBAC success rate was 57.4%. Mode of delivery was significantly associated with history of one previous vaginal delivery. For neonatal outcomes, the difference was not statistically significant. Percentage of Elective repeat caesarean section (ERCS) was 62.5% (Group 2). Percentage of VBAC in TOLAC group was 57.4%(Group 1a). Percentage of Emergency caesarean section in TOLAC group was 42.6% (Group 1b).
Conclusion: Prior vaginal delivery is a good predictor of VBAC. TOLAC is acceptable option for women with previous one caesarean section.

Keywords: VBAC (vaginal birth after caesarean), TOLAC (trial of labour after caesarean), ERCS (elective repeat caesarean section), emergency cesaraen section

Introduction
In today's situation there is concern over rising caesarean section rate throughout the world[1]. WHO recommend an average of no more than 10-15% of birth by caesarean section, for optimal maternal and neonatal outcomes [2]. The main reason for the increase in caesarean rate is both increase in number of instituitional deliveries and more number of previous LSCS patients. The concerns about maternal and neonatal complications have contributed to decrease in vaginal birth after caesarean (VBAC) rates. There are complications with both VBAC and elective repeat LSCS. In an institution, if the patients are properly selected for TOLAC, VBAC offers many advantages over repeat caesarean section. There are nil operative risks, shorter hospital stay, easy recovery after VBAC. Attempting VBAC is based upon careful selection of patients after thorough counselling, the risk of uterine rupture and following more recent guidelines while managing labour.

Aim and Objectives
Primary aim
The primary aim of the study is to determine the success rate of TOLAC.

Secondary aims
1. To compare prior vaginal delivery in present outcome in TOLAC vs. ERCS.
2. To compare neonatal outcomes in TOLAC vs. ERCS
3. To determine the percentage of ERCS, VBAC and emergency caesarean section following TOLAC.

Materials and Methods

This prospective study was carried out in the Department of Obstetrics and Gynecology at Government Thiruvannamalai medical college, Tamil Nadu from July 2019 to July 2020.

Inclusion criteria

- All antenatal mothers with previous one LSCS.
- Uncomplicated singleton pregnancies with cephalic presentation.

Exclusion criteria

- Medical co morbidities like GDM, hypertension, heart disease
- Obstetric complications like reduced liquor, IUGR, malpresentation, placenta previa
- Previous two caesarean sections
- Previous scars in uterus like myomectomy scar or upper segment scars (ruled out by case records)

Number of groups studied

Group 1: Trial of labour after caesarean
1a: VBAC delivery
1b: emergency caesarean section

Group 2: Elective repeat caesarean section
All antenatal patients with previous one LSCS were assessed for TOLAC criteria.

Tolac Criteria

- One lower segment transverse scar
- Previous non recurrent indication
- Inter delivery interval > 2 years
- Vertex presentation
- Adequate pelvis
- Estimated foetal weight < 3 kg
- No other medical or obstetric complications

Patients who fulfilled all these criteria and who were willing to undergo TOLAC were included in Group 1. Bishops score was assessed and labour induced by stripping or foley induction or by oxytocin acceleration. Spontaneously progressing labours were monitored by one to one care. Continuous foetal monitoring by cardiotocogram was done. Amniotomy and oxytocin augmentation was done for appropriate cases. Patients delivering by vaginal route were grouped under 1a (VBAC group).
If there are signs and symptoms of scar dehiscence or rupture, emergency caesarean section was done and these patients were grouped under 1b (Emergency caesarean group).
Patients not satisfying TOLAC criteria were posted for elective repeat LSCS at 39th week and were enrolled in group 2 (ERCS group).
All patients included in the study were followed up for 7 days. Maternal complications like fever, wound infection and the need for blood transfusion were assessed. Neonatal complications like the need for NICU admission were also assessed.
All acquired data were arranged and scrutinized statistically. The data was analysed and the final results of pregnancy outcome and risk factors were listed.

Results

During the study period, a total number of 288 patients were included in the study who had previous one caesarean section. Table 1 shows that out of total 288 patients, 180 patients were directly taken for elective caesarean section (group 2-62.5%). This group included those who were not fulfilling TOLAC criteria and those who were not willing for TOLAC. 108 cases fulfilled the TOLAC criteria and were given trial of labour. 62 patients had successful vaginal delivery (group 1a-57.4%). 46 patients had failed trial (group 1b- 42.6%). Emergency LSCS done for those patients.

Table 1: percentage of Mode of delivery in each group

Mode of delivery	Number of patients (n=288)	Percentage (%)
Group 1 TOLAC	108	37.5
1a VBAC	62	57.4
1b Emergency LSCS	46	42.6
Group 2 Elective LSCS	180	62.5

During the study VBAC success rate in our institution was 57.4% (table 2)

Table 2: VBAC Success Rate

Total no. of cases	No of cases undergoing TOLAC	Total no of VBAC	VBAC success rate
288	108	62	57.4%

In this study, 46 cases underwent emergency caesarean. Out of 46 mothers, 15 (32.6%) had indication of failure to progress, scar tenderness in 11 patients (23.9%), fetal distress in 9(19.56%) failed induction in 6(13%) and meconium stained liquor in 4(8.69%).

Table 3: percentage of indications for emergency LSCS

Indications	%
Failure to progress	32.6
Scar tenderness	23.9
Fetal distress	19.56
Failed induction	13
Meconium stained liquor	8.69

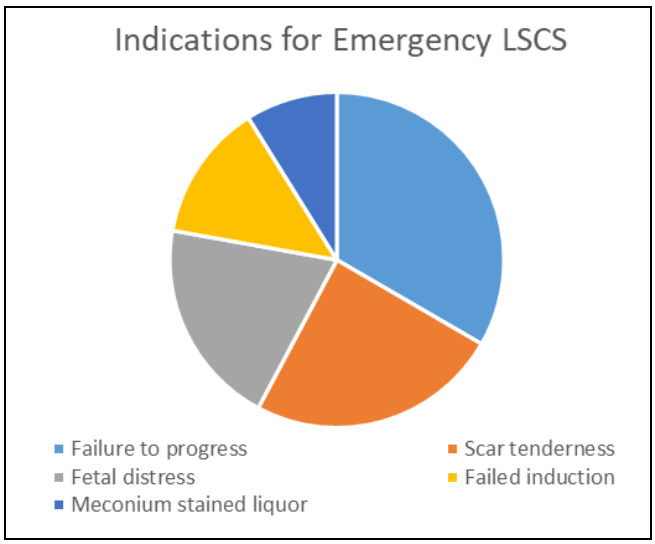

Fig 1: Indications for Emergency LSCS (Group1b)

Among 288 cases, 40 cases had history of one vaginal delivery. Out of which, 32 had vaginal delivery and only 8 had caesarean section. Thus, mode of delivery in present pregnancy was significantly associated with history of one previous vaginal delivery (Figure 2 and Table 4).
P value is 0.0516 which is statistically significant.

Table 4: Previous vaginal delivery

Previous vaginal delivery	Group 1a (%) VBAC	Group 1b (%) Emerg. LSCS
Yes	36 (58.06%)	18 (39.13%)
No	26 (41.9%)	28 (%)

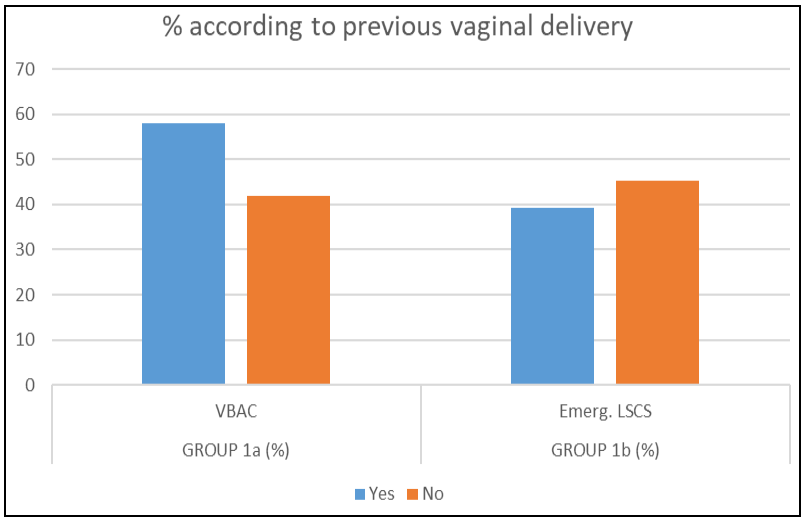

Fig 2: previous vaginal delivery

It was considered in the present study that morbidity in group 1b is higher than group 1a and group 2.
Atonic PPH was seen in 16 cases in group1b (emergency LSCS) whereas in group 1a, only 6 cases had atonic PPH and 4 in group 2 had the problem.
Blood transfusion was given to 18 cases in group 1b, 7 cases in group1a and 6 cases in group 2.
Scar dehiscence was present in 0 cases in group 1a, 3 cases in group 1b, 4 cases in group 2.
Fever, impending rupture, wound infection and wound gaping, UTI were slightly higher in group 1b.

Table 5: Maternal morbidity

	Group1a (Vbac)	Group1b (Emerg Lscs)	Group2 (Elective Lscs)
Blood transfusion	7	18	6
Atonic PPH	6	16	4
Traumatic PPH	2	1	0
Fever	2	7	3
Adhesions	0	8	7
Scar dehiscence	0	3	4
Impending rupture	0	6	3
Wound infection	1	8	4
Wound gaping	0	6	2
UTI	2	6	5
Thinned LUS	0	4	4

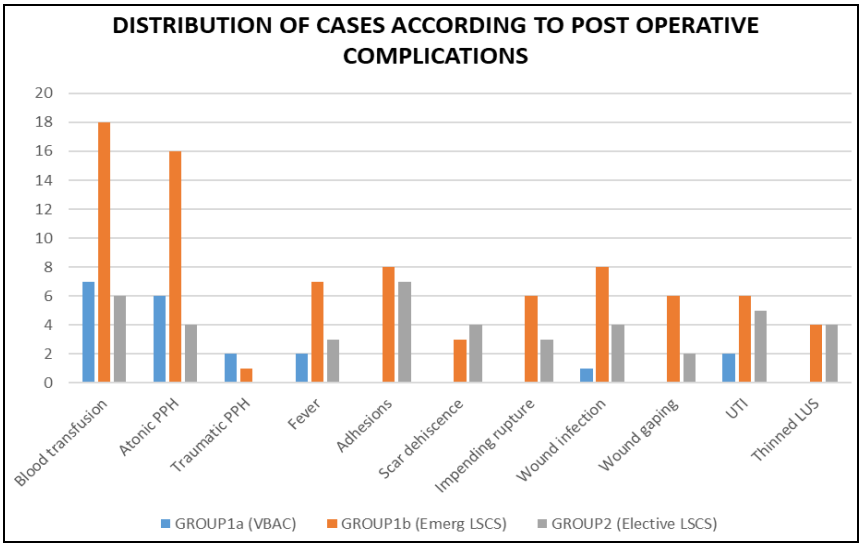

Fig 3: Distribution of cases according to post-operative complications

In this study, 226 were delivered by LSCS, 220 were live births, 6 were stillbirths, while in VBAC all 62 were live births. The difference was not statistically significant (P value 0.194)

Table 6. Percentage of live births

	VBAC	LSCS
Live Births	62 (100%)	220(97.3%)
Still Births	0	6(2.7%)

Regarding APGAR score at 5 mins in neonates, in group2, 164 had APGAR above 8 and 13 had apgar below 8. I group 1b, 34 had APGAR >8, 9 had APGAR <8. In group 1a 57 had APGAR>8 and 5 had <8. The chi square statistic is 7.5844. p value is 0.022546.

Table 7. APGAR at 5 mins

APGAR at 5 mins	Group 1a	Group1b	Group 2
>8	57(91.9%)	34 (79%)	164 (92.65%)
<8	5(8.1%)	9 (21%)	13(7.35%)

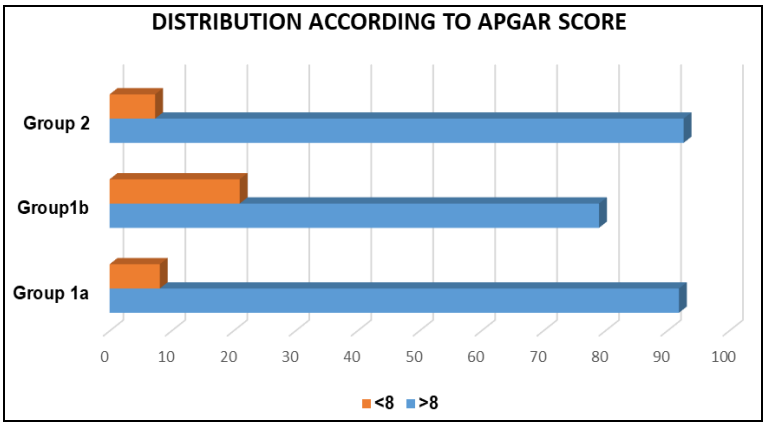

Fig 4: Distribution according to APGAR score.

Out of 6 still births, 2 was meconium stained liquor (1 in emergency LSCS and 1 in elective LSCS), 1 was uterine rupture, 1 had fetal distress, 2 had scar dehiscence.

Table 8: Still births

	Still births
Meconium stained liquor	2
Uterine rupture	1
Fetal distress	1
Scar dehiscence	2

Table 9: Percentage of NICU admissions

NICU admissions	Group 1a	Group1b	Group 2
YES	5(8.1%)	12(27.9%)	56(31.6%)
NO	57(91.9%)	31(72.1%)	151(85.3%)

The chi square test is 10.164. The p value is 0.006208. The result is statistically significant at $p < 0.05$.

Discussion

In the present study, 288 cases were included. TOLAC criteria was applied. 180 were taken for elective LSCS (Group2). This includes patients not willing for TOLAC. 108 were allowed trial of labour. Out of 108 cases, 62 delivered vaginally, 46 required Emergency LSCS. The success rate of VBAC was 57.4%. VBAC success rate was comparable to the studies of shruti S. Goel, Mahima Tiwari *et al.* [3] and Gaddam Santhi Sri *et al.* [4].
Among the indication for Emergency LSCS, the commonest indication was failure to progress, second was scar tenderness.
Success of mode of delivery was associated with history of previous vaginal delivery. Results are comparable with Shruti S. Goel, Mahima Tiwari *et al*. This concludes that previous vaginal delivery had a very good chance of VBAC.

Conclusion

Prior vaginal delivery is a good predictor of mode of delivery in present pregnancy. Thus repeat caesarean surgeries can be avoided by careful selection of patients for TOLAC.

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