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Original Research Article

A prospective observational study of role of epidural in trial of labour after cesarean section in view of maternal and neonatal outcome in a tertiary care hospital

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ABSTRACT

Background: In a well-equipped hospital, trial of vaginal delivery is done in selected cases of previous C-section (CS). Epidural analgesia administration has been proved to be good adjunct in trial of labor after caesarean (TOLAC).
Methods: This study is a prospective observational study done in a tertiary care institution in Tamil Nadu from May 2019 to July 2019. 50 cases with previous history of one CS were selected. Single ton pregnancy, previous transverse lower segment cesarean section admitted cases with adequate pelvis with no other co-morbidities were selected. Epidural analgesia was administered once mother was in established labor. TOLAC was continued till satisfactory progress and emergency repeat caesarean was taken in case of Suspected scar dehiscence (SSD) or abnormal fetal heart rate tracings. Quantitative data was expressed in mean and standard deviation. For qualitative data percentage was used.
Results: In 50 cases observed the mean age of the cases was 26±3.64 years. TOLAC was successful in 41 (82%) mothers out of 50. The mode of delivery in 41 TOLAC mothers was found to be forceps in 18 cases (36%) and ventouse delivery 18 cases (36%). Only 9 cases had needed emergency CS (18%). The major indication for CS in TOLAC was found to be fetal distress in 4 number of cases (8%). 43 babies delivered were healthy, 6 babies (12%) admitted in NICU.
Conclusions: With the application of epidural analgesia on attempted vaginal delivery in previous cesarean, vaginal delivery was 82% cases.

Keywords: Epidural, Trial of labor after caesarean, Vaginal birth after cesarean section

INTRODUCTION

Women who become pregnant after delivering their first baby by caesarean section often have to make a decision about how to deliver their next baby. Typically, they will be offered the choice of having an elective repeat caesarean section (ERCS) or attempting a vaginal birth after caesarean section (VBAC).[1,2] Although the World Health Organization has recommended that no more than 15% of deliveries should be via Cesarean section (CS), there is a continuous uptrend in the incidence of the CS in the developed and developing countries.[3-6]

Epidural analgesia administration has been a good adjunct in Trial of labor after caesarean (TOLAC).[7]

As per Flam Geiger scoring system, the cases were categorized. In 1999 American Congress of Obstetricians (ACOG) stated that in a practice bulletin that a physician who is capable of monitoring labor and performing an

emergency caesarean delivery be "immediately" available as offered to readily available when women attempt VBAC.[8]

All post-caesarean pregnancies do not require repeat caesarean section and majority of them may have uncomplicated vaginal delivery.[9] There is a risk of uterine rupture in vaginal birth after caesarean delivery (VBAC) leading to catastrophes which can be avoided by continuous monitoring with prompt intervention.[10-13] Evidence confirming the safety of TOLAC within proper guidelines has been available for more than years.[14-17] To control the rising rate of caesarean sections (CSs), vaginal birth after caesarean section (VBAC) is one of the strategies developed.[18] In a well-equipped hospital, trial of vaginal delivery is done in selected cases of a previous CS.[19] However wide variation in VBAC rates still exists between hospitals and obstetricians and several factors increase the likelihood of a failed trial, which in turn might lead to increased maternal and perinatal morbidity and mortality rates. In view of this, trial of vaginal delivery in women with post caesarean pregnancy remains controversial and continuous critical audit of the trends is imperative. Women and their relatives should be informed and counselled appropriately regarding the safety and the risk involved in both the modes of delivery. There is paucity of studies regarding role of epidural in TOLAC in Indian sub-continent. Hence, authors tried to analyse maternal and neonatal outcome of the TOLAC as well the success rate of TOLAC with epidural analgesia in our government run tertiary care institute. This study might provide an evidence and guideline for patients and the Obstetricians while making the choice of either TOLAC with epidural analgesia and emergency repeat caesarean section (ERCS).

In this study authors have conducted a prospective observational study of maternal and neonatal outcome in women undergoing TOLAC with epidural analgesia.

METHODS

This study is a prospective observational study which was done in the department of obstetrics and gynecology, Government Rajaji Hospital, a tertiary care institution in Madurai, Tamil Nadu from May 2019 to July 2019. The average total number of deliveries per month is 1300. 50 cases with previous history of one caesarean section were selected. From the admitted antenatal mothers were assessed for a trial of vaginal delivery. Single ton pregnancy, previous transverse lower segment cesarean section cases with adequate pelvis with no other co-morbidities were selected and were included in the study after informed written consent.

Cases with previous two or more LSCS, contracted pelvis and cephalopelvic disproportion, previous classical or inverted T-shaped incision on the uterus, and those having other medical or obstetrical complications associated with pregnancy have been excluded from the study. A total of 50 cases that fulfilled the selection criteria were enrolled in the study. Ante natal mothers and their relatives were explained about the advantages of vaginal birth after cesarean. They were also explained about the risk of scar dehiscence and the need for emergency CS, if trial of vaginal delivery failed. Written informed consent was obtained at the time of enrolment in the study. The patients were asked to come for regular antenatal checkups and were advised to plan their delivery in the hospital where the study was conducted. Hematological and serological investigations and obstetric sonography were performed during antenatal visits. The women were advised to get admitted in the ward, two week prior to their expected date of delivery.

After going through the record related to her previous CS, a decision regarding TOLAC was taken by a senior obstetrician in the later weeks of pregnancy or during labor. Induction was done in selected cases through mechanical methods/PGE2 gel according to the Bishop score. The cases selected for TOLAC were monitored carefully during labor by continuous electronic fetal monitoring.

Epidural anesthesia procedure: under strict aseptic precautions, after painting and draping the area epidural needle Tuohy needle 16 or 18 gauge inserted at L2-L5 space identified by loss of resistance technique, then corresponding catheter is inserted and 4-6 cm in addition to epidural space from skin is fixed, then test dose with 3 ml 1.5% lignocaine is given to confirm the correct space, then secure the epidural catheter. Local anesthesia 0.125% Bupivacaine 10-15 ml is given in patient with true labour pain and cervical dilatation of 4 cm. Top up will be giver for every 90 mins with 0.125% Bupivacaine 10cc.[20]

Epidural analgesia was administered once mother was in established labor. Intrapartum continuous monitoring and all patients were monitored with continuous CTG were done by using the standard partograph of the World Health Organization (WHO). Four-hourly internal examinations were performed to assess the progress, and special attention was paid towards the evidence of scar dehiscence or rupture. The trial of labour after cesarean was continued till there was satisfactory progress. Emergency repeat caesarean was taken in case of suspected scar dehiscence or abnormal fetal heart rate (FHR) tracings. Cases with successful VBAC delivery were kept in the hospital for five days and those who required repeat CS were kept for seven days after the operation. All cases have been given broad-spectrum antibiotics for 7 days.

Quantitative data was expressed in mean and standard deviation. For descriptive statistics frequency and percentage were used and to find out the difference between the proportions, chi square test or Fischer exact test was used, $p<0.05$ was considered significant.

RESULTS

In 50 cases observed the mean age of the cases was 26±3.64 years.

Table 1: Previous indication for caesarean section in TOLAC.

Indication for previous caesarean	TOLAC		Total
	VBAC	Repeat caesarean	
Fetal distress	16	2	18
PROM with fetal distress	5	3	8
Failed induction	6	1	7
Breech	4	0	4
CPD	1	1	2
Severe oligohydramnios	3	0	3
Post-dated with failed Induction	6	2	8
Total	41 (82%)	9 (18%)	50 (100%)

It was observed that in 50 cases with previous caesarean section, the major indications for previous caesarean section (Table 1) was fetal distress in 16 cases, premature rupture of membrane (PROM) in 9 cases (18%) and Failed induction in 9 cases (18%). There were no significant differences among previous indications for caesarean section and trial of labor after caesarean section ($p>0.05$).

TOLAC was successful in 41 (82%) mothers out of 50. The mode of delivery in 50 observed cases with previous caesarean section (Table 2) was found to be forceps in 18 cases (36%) and ventouse delivery 18 cases (36%). Only 9 cases had needed emergency caesarean section (18%).

The major indication for caesarean section (Table 3) in trial of labour (TOLAC) was found to be fetal distress in 4 number of cases (8%) followed by suspected scar dehiscence in 3 cases (6%) and scar rupture 1 cases (2%) and failed induction in 1 case (2%). Out of 4 cases of fetal distress indicated, only one baby had mild respiratory distress. Other 3 babies were normal. Out of the 3 taken for suspected scar dehiscence, only one patient had scar rupture intra-operatively. Lower uterine segment was intact in other 2 patients.

Table 2: Mode of delivery in TOLAC.

Mode of delivery	No. of cases	Percentage
Forceps	18	36
Ventouse	18	36
Vaginal delivery	5	10
Caesarean	9	18
Total	50	100

Table 3: Indication for repeat section in TOLAC.

Indication for caesarean	No. of cases	Percentage
Abnormal fetal heart rate tracings	4	44%
Suspected scar dehiscence	3	34%
Scar rupture	1	11%
Failed induction	1	11%
Total	9	100%

Out of 50 cases, 9 cases had repeat caesarean indication in which 4 babies had in NICU admission and 1 baby have neonatal mortality. The trend was found to be statistically significant $p<0.05$ (Table 4). Out of the 50 cases delivered, 43 babies delivered were healthy and handed out to the mother (86%), there were 6 babies (12%) admitted in neonatal intensive care unit (NICU) due to fetal distress (4), preterm with low birth weight (1) and heart disease (1). 1 case of perinatal death (2%) has been reported in this study (Table 4). Out of the 4 cases of abnormal fetal heart rate tracing decided for Emergency LSCS; post-natal evaluation showed that 3 out of 4 babies had no acidosis fetal distress and actually one baby had fetal distress which resolved eventually.

Table 4: Neonatal outcome versus TOLAC.

TOLAC	Baby status			Total	X^2, df, p value
	Healthy	NICU admission	Expired		
VBAC	39 (95%)	2 (5%)	0	41 (82%)	16.38, 2, 0.01
Repeat caesarean section	4 (44%)	4 (44%)	1 (12%)	9 (18%)	
Total	43 (86%)	6 (12%)	1 (2%)	50 (100%)	

X2- Chi square value, $p<0.05$ trend is statistically important.

DISCUSSION

Epidural analgesia plays an important role in patient acceptance of trial of labor after prior cesarean delivery. Pre-anesthetic evaluation and counseling should occur early in the patient care. Intrapartum management includes appropriate oral intake and close communication between anesthetist and obstetrician. Epidural analgesia is emerging as safe and significant adjunct for a successful TOLAC. It is essential to counsel patients with

a history of prior cesarean section, ideally during antenatal period, regarding the benefits and risks of TOLAC, enabling them to make informed choice early and probably bring down the repeat cesarean section rate. Induction is safe in selected cases. Majority of the cases of previous CS done for non-recurrent indication can be delivered safely by the vaginal route, without any major complication to the mother and the newborn, in an institution having facilities for emergency caesarean sections. It has been proved to be a safe alternative to repeat an elective caesarean.

The American college of obstetricians and gynecologists (ACOG) estimated the risk of uterine rupture in women with a previous CS and concluded that the lower segment caesarean scar has a minimum risk (0.2-1.5%) of rupture during vaginal delivery. There was no maternal mortality in the present study. Out of total 50 cases enrolled in the study 41 delivered vaginally. While repeat cesarean delivery was carried out in 9 cases. When trial of labour had to be abandoned for various reasons including fetal distress, non-progress and suspected scar dehiscence. 18 babies were born by ventouse extraction and 18 babies by forceps extraction to cut short second stage of labor and poor maternal bearing down due to epidural. The remaining 9 babies were born by emergency CS, following failed trial of labor after cesarean section (TOLAC). Four was performed for fetal distress and the other three were performed for suspected scar dehiscence. There was one perinatal mortality in the present studydue to scar rupture.

To compare the results with other studies, Granovsky G et al reported in labor cesarean rate with epidural was 8.7%, uterine rupture rate was 0.4% compared whereas in this study the repeat cesarean rate was 18% and uterine rupture was 2% (1 case).[7]

In another study by Shmueli A et al, where the association between epidural anesthesia and mode of delivery in TOLAC was studied showed that 12.9% incidence of repeat cesarean delivery, the indication being abnormal fetal heart tracings in 6.5%, and 6.6% of babies had NICU admission, compared to 18% repeat cesarean section and 12% had NICU admission in this study.[21]

The limitation of the study lies in the fact that the study was carried out in a tertiary care centre, where there is adequate manpower to supervise each delivery, reducing complication rates of TOLAC. The other limitation in this study is that the sample size is small and also the present study is done in single center. A multi-centric study might be able to give a holistic picture.

CONCLUSION

With the application of epidural analgesia on attempted vaginal delivery in this study patients with a previous caesarean birth, authors were able to reduce this study caesarean delivery rate for this population alone by 18%. In summary, the benefits associated with a trial of labor in the patient with a prior caesarean birth far outweigh the risks. The policy of "once a caesarean section, always a caesarean section" should be abandoned.

Therefore, in this study authors have reported that the use of epidural anaesthesia has enhanced the success of vaginal delivery in women undergoing a trial of labor following an earlier caesarean section.

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