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Original Research Article

Trail of labor versus elective repeat cesarean section: a comparison of morbidity and mortality at tertiary care teaching hospitals in India

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ABSTRACT

Background: As cesarean birth rates continue to rise, more women are faced with the choice of planning a vaginal delivery or a repeat cesarean section after a previous cesarean section. The objective of this prospective study was to study the morbidities and mortality of women attempting a trial of labor after cesarean (TOLAC) versus elective repeat cesarean section (El-RCS).

Methods: Prospective data was recorded on management practices, associated complications and morbidity & mortality for a period of 8 months on 15664 consecutive cases of previous cesarean section reporting at 30 medical colleges/ teaching hospitals for delivery.

Results: A trial of labor was planned in 25.8% (4035) women and 34.5% (5399) women underwent elective repeat cesarean section and rest had emergency repeat cesarean section. Overall maternal morbidity due to any cause was 20.7% among El-RCS as compared to 14.2% in TOLAC which was statistically significant (OR: 1.57, CI: 1.41-1.76, P=0.00). Blood loss of more than 1000ml was around 8.0% among TOLAC where as in El-RCS it was 8.8% (OR: 0.89, CI: 0.77-1.94, p=0.14 not statistically significant). Blood transfusion was given in 3.7% in TOLAC where as in El-RCS it was given in 6.5% (OR: 0.56, CI: 0.45-0.68, p=0.00 highly significant). Complication like dehiscence of scar was similar in both groups. Post-operative complication were seen in 2.8% cases in TOLAC where as in El-RCS it was 5.8% (OR: 0.47, CI: 0.38-0.59, p=0.00 highly significant). Uterine rupture was 0.3% in TOLAC where as in El-RCS it was 0.7% (OR: 0.43, CI: 0.21-0.87, p=0.009 statistically significant). Maternal mortality was reported in 0.2% cases of TOLAC as compared to 0.1% cases in El-RCS (p=0.17) which was not statistically significant.

Conclusions: Maternal morbidity was found to be more in elective repeat cesarean section than trial of labor after cesarean section.

Keywords: Elective repeat cesarean section, Maternal, Morbidity and mortality, Trial of labor after cesarean

INTRODUCTION

As cesarean birth rates continue to rise, more women are faced with the choice of planning a vaginal or a repeat cesarean birth after a previous cesarean section. While there are risks and benefits for both vaginal birth after cesarean (VBAC) or repeat cesarean section. For many decades, there has been a public health concern about increasing cesarean section rates. In 1916 Cragin made a statement "once a cesarean, always a cesarean" was revised in many countries, and a trial of labor in women with history of cesarean section was proposed as an attempt to reduce cesarean section rates and subsequent maternal and neonatal morbidity.[1-4]

Trial of labor after cesarean is defined as the plan to attempt labor when a woman has had a previous cesarean birth, with the goal of achieving a successful vaginal

birth. Elective repeat cesarean section is defined as a cesarean delivery performed before the onset of labor. Cesarean delivery is one of the most commonly performed surgical procedures and elective repeat Cesarean section (El-RCS) accounts for a large proportion of cesarean section.[5] VBAC is a safe option for many women.[6]

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

The rate of cesarean section needs to be reduced and this can be achieved to a small extent by avoiding a primary cesarean section done without explicit indications and more importantly, by resorting to a trial of vaginal delivery after previous cesarean section, which is safe for the fetus.[7,8]

The present study was undertaken to study the maternal morbidity and mortality in women who underwent either a TOLAC or an El-RCS after a previous cesarean section.

METHODS

A hospital based maternal health database was established at 30 medical colleges/teaching hospitals situated all over the country and prospective data was recorded for a period of 8 months in 2005-2006 on management practices, associated complications, morbidity and mortality in 15664 consecutive cases of previous cesarean section reporting for delivery. Structured case record forms were completed by trained medical research staff.

The study population was divided into 2 groups based on whether the woman underwent a trial of labor after cesarean (TOLAC) or an elective repeat cesarean section. (El-RCS) as the mode of delivery.

Both groups (TOLAC and El-RCS) were compared with regard to any type of maternal morbidity, uterine rupture/dehiscence, and emergency interventions like blood transfusion and hysterectomy.

Inclusion criteria was that all the women with history of one prior cesarean delivery at tertiary care teaching hospitals were included in the study after obtaining informed consent.

Statistical analysis

The data collected were coded and fed into the computer using Epi-Info and exported to the Statistical Package for Social Science. Statistical analysis was performed using SPSS 20.0 for windows and various descriptive statistics were used to calculate frequencies, percentages, means and standard deviation and to find association chi square test was used.

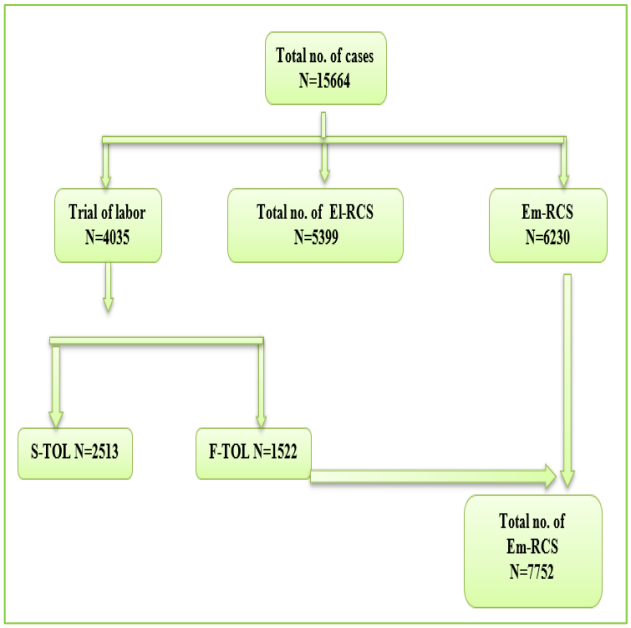

Figure 1: Diagrammatic representation of the selection of the study population.

RESULTS

Of the 15664 women with a previous cesarean section, 25.8% (4035) chose to undergo a trial of labor and 34.5% (5399) elected an elective repeat cesarean section. The rest had emergency repeat cesarean for various indications.

The mean age of women who had TOLAC was 26.0±3.8 years. The value for those who had El-RCS was 26.5±4.0 years. The difference in their mean age was statistically significant (P=0.00).

Women less than 25 years were more likely to attempt a trial of labor than to undergo elective repeat cesarean section. More than 70% of the women who had TOLAC and El-RCS were in their second delivery (OR: 0.81, CI: 0.74-0.89, P: 0.00). More number of women was booked in El-RCS (70.4%) as compared to TOLAC (64.9%). The characteristics of the women in the two groups are shown in Table 1.

Table 2 shows the overall maternal morbidity due to any cause was 20.7% among El-RCS as compared to 14.2% in TOLAC which was statistically significant (OR: 1.57, CI: 1.41-1.76, P=0.00).

The difference in any morbidity was statistically significant (P=0.00). Blood loss of more than 1000ml was around 8.0% among TOLAC where as in El-RCS it was 8.8% (OR: 0.89, CI: 0.77-1.94, p=0.14 not statistically significant). Blood transfusion was given in 3.7% in TOLAC where as in El-RCS it was given in 6.5% (OR: 0.56, CI: 0.45-0.68, p=0.00 highly significant). Complication like dehiscence of scar in TOLAC was 88 (2.2%) as compared to 119 (2.2%) in El-RCS (p=0.000).

Table 1: Characteristics of pregnant women undergoing trial of labor or an elective repeat cesarean section.

Characteristics	Trial of labor (n=4035)	Elective repeat cesarean section (n=5399)	Odds ratio (95% CI)	p-value
Maternal age (years)				
<=19	34 (0.8)	40 (0.7)	1.14 (0.7-1.85)	
20-24	1488 (36.9)	1747 (32.4)	1.22 (1.12-1.33)	
25-29	1765 (43.7)	2377 (44.0)	0.99 (0.91-1.08)	0.00
30-34	605 (15.0)	962 (17.8)	0.81 (0.73-0.91)	
>=35	143 (3.5)	273 (5.1)	0.89 (0.56-0.85)	
Mean±SD	26.0±3.8	26.5±4.0		
Parity				
2	2868 (71.1)	4055 (75.1)	0.81 (0.74-0.89)	
3	898 (22.3)	1121 (20.8)	1.09 (0.99-1.21)	0.00
4	201 (5.0)	162 (3.0)	1.69 (1.36-2.11)	
5	50 (1.2)	40 (0.7)	1.68 (1.08-2.62)	
>5	18 (0.4)	21 (0.4)	1.15 (0.58-2.26)	
Booking status				
Booked	2620 (64.9)	3801 (70.4)	0.78 (0.71-0.85)	0.00
Unbooked	1415 (35.1)	1598 (29.6)		
Infant's birth weight				
<2500	988 (24.5)	732 (13.6)	2.06 (1.85-2.3)	
2500-2999	1630 (40.4)	2125 (39.4)	1.04 (0.96-1.14)	
3000-3499	1105 (27.4)	1809 (33.5)	0.75 (0.68-0.82)	0.00
3500-3999	246 (6.1)	490 (9.1)	0.65 (0.55-0.77)	
≥4000	31 (0.8)	67 (1.2)	0.61 (0.39-0.95)	
Not known	35 (0.9)	176 (3.2)		

Table 2: Morbidity in pregnant women who chose atrial of labor or an elective repeat cesarean section.

	Trial of labor (n=4035)	Elective repeat cesarean section (n=5399)	Odds ratio (95% CI)	P-value
Any morbidity	574 (14.2)	1117 (20.7)	1.57 (1.41-1.76)	0.0
Anaesthetic complication	16 (0.4)	46 (0.9)	0.46 (0.25-.85)	0.006
Complication during surgery	62 (1.5)	145 (2.7)	0.57 (0.41-.77)	0.0002
Dehiscence of the scar	88 (2.2)	119 (2.2)	0.99 (0.74-1.32)	0.94
Uterine rupture	12 (0.3)	37 (0.7)	0.43 (0.21-.87)	0.009
Hemorrhage during surgery >1000 ml	321 (8.0)	476 (8.8)	0.89 (0.77-1.04)	0.14
Broad ligament hemotoma	3 (0.1)	13 (0.2)	0.31 (0.07-1.117)	0.052
Blood transfusion	151 (3.7)	353 (6.5)	0.56 (0.45-.68)	0.00
Hysterectomy	3 (0.1)	10 (0.2)	0.4 (0.09-1.59)	0.15
Post-operative complication	114 (2.8)	313 (5.8)	0.47 (0.38-0.59)	0.0

Post-operative complication was seen in 2.8% (114) cases in TOLAC where as in El-RCS was 5.8% (313) (OR: 0.47, CI: 0.38-0.59, p=0.00 highly significant). Uterine rupture was 0.3% (12) in TOLAC as compared to 0.7% (37) in El-RCS (OR: 0.43, CI: 0.21-0.87, p=0.009 statistically significant). Maternal death was reported in 0.2% (10) cases of TOLAC as compared to 0.1% (5) cases in El-RCS (p=0.17) which was not statistically significant. The average duration of hospital stay for TOLAC was 4.5±3.9 days as compared to El-RCS 10.6±5.0. This shows that women who had a successful VBAC had a significantly lesser duration of hospital stay as compared to those had a cesarean section (p=0.000 highly significant) in TOLAC and lL-RCS respectively. The rates of admission to a neonatal intensive care unit was 11.6% versus 11.2% (OR: 1.04, CI: 0.91-1.18, p=0.60 not statistically significant) in TOLAC and El-RCS respectively.

DISCUSSION

There has been a steady increase in the rate of cesarean section even in the developing countries over the past few decades causing considerable professional concern. A total of 155863 deliveries took place in this study duration, out of which 43824 were the number of cesarean section and 15664 were the number of previous cesarean section. Of 15664 women with history of

cesarean, 4035 women who were allowed a trial of labor, 2513(62.3%) delivered vaginally, 5399 (34.5%) women underwent elective repeat cesarean section. There was failed trial of labor (F-TOL) in 1522 cases and requiring an emergency cesarean section for delivery of baby. Therefore, a total number of 7752 (49.5%) women needed surgery in emergency.

Miller et al. reported a post cesarean pregnancy rate of 8.1% in 1983 and 14.1% in 1992.9 Bhat BPR et. al. reported post caesarean pregnancy rate of 8.7%.10 Present study showed a post cesarean pregnancy rate of 10.1%. In India and elsewhere have shown that trial of labor in a patient with previous cesarean section is not only safe but feasible.[11-13] Although a trial of labor ends in vaginal delivery in 60% to 80% of women who attempt it after a previous cesarean section, we had a 62.3% success in those who had trial of labor.[14-16] The most important issue regarding maternal safety with respect to a trial of labor after a previous cesarean section will occur and lead to serious morbidity or death. In present study maternal mortality was reported in 0.2% cases of TOLAC as compared to 0.1% cases in El-RCS which was not statistically significant.

The overall maternal morbidity in present study was 14.2%, 20.7% in TOLAC and El-RCS respectively which was highly significant (p=0.00). Most of the complications were more in women undergoing an elective cesarean section than in those undergoing a trial of labor which were similar to the findings of Flamm et al and Rosen et al. The frequency of uterine rupture in the TOLAC (0.3%) was similar to that in other studies.[17-19] The number of hysterectomies, a complication for a woman of reproductive age, was similar in the two groups. Post-operative complication (5.8%) contributed more morbidity among women who chose a El-RCS. Women for whom a trial of labor was unsuccessful and who therefore require a second cesarean section have the greatest morbidity.[20]

The rates of admission to a neonatal intensive care unit was 11.6% versus 11.2% (OR: 1.04, CI: 0.91-1.18, p=0.60 not statistically significant) in TOLAC and El-RCS respectively. The average duration of hospital stay for TOLAC was 4.5±3.9 days as compared to El-RCS 10.6±5.0. This shows that women who had a TOLAC had a significantly lesser duration of hospital stay as compared to those had an El-RCS (p=0.000 highly significant). This was comparable with other studies.

However, there is as yet no confirmed method of predicting the likelihood that a trial of labor will lead to vaginal delivery for a patient with a previous cesarean section. Randomised controlled trials are required to provide the most reliable evidence regarding the benefits and harms of both trial of labor and elective repeat cesarean section for women with a previous cesarean section. Maternal morbidity and mortality needs to be studied in greater detail.

CONCLUSION

Maternal morbidity was found to be more in elective repeat cesarean section than trial of labor after cesarean section.

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