www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i9.37

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Maternal Morbidity and Mortality Following a Trial of Labor in Women with Previous Cesarean Section at Tertiary Care Teaching Hospitals in India

Authors
Balwan Singh Dhillon[1], Nomita Chandhiok[1], D.K. Shukla[2]
[1]Indian Council of Medical Research, Ansari Nagar, New Delhi
[2]Director-in-Charge, National Institute of Medical Statistics, New Delhi
Corresponding Author
B.S. Dhillon
Email: *dhillonbs.hq@icmr.gov.in*

ABSTRACT
Background: *Repeat caesarean section and planned vaginal birth after caesarean section are both associated with benefits and harms.*
Methods: *Prospective data was recorded on management practices, associated complications, morbidity and mortality on 15664 consecutive cases of previous cesarean section reporting at 30 medical colleges/teaching hospitals for delivery.*
Results: *A total of 4035 (25.8%) women out of the 15664 women with a previous cesarean section underwent a trial of labor (TOL). Of these, 2513 (62.0%) had a successful trial of labor (S-TOL) while the rest required an emergency repeat cesarean section. The overall maternal morbidity was 2.3%and 34.0% in women with S-TOL and failed trial of labor (F-TOL) respectively. Blood loss more than 1000ml was seen in 20.6% of cases with F-TOL where as for S-TOL it was 0.3%, blood transfusion was 7.0% in F-TOL where as it was 0.8% in S-TOL, dehiscence of scar in F-TOL was 5.4% as compared to 0.2% in S-TOL, post-operative complication/delivery were seen in 6.8% cases in F-TOL where as in S-TOL it was 0.4%, uterine rupture was 0.7% in F-TOL as compared to 0.1% in S-TOL and was statistically significant. Maternal death was seen in 4 (0.3%) cases of F-TOL as compared to 6 (0.2%) cases in S-TOL (p=0.45) and the difference was not significant. There were 27 (1.8%) child deaths who born after F-TOL as compared to 65 (2.6%) born after S-TOL which was highly significant (P=0.00).*
Conclusions: *Women who experience failed trial of labor have higher risk of morbidity as compared to those with a successful trial of labor. More accurate prediction for safe, successful vaginal birth after cesarean delivery is needed.*
Keywords: *Cesarean section, trail of labor, maternal morbidity, mortality.*

INTRODUCTION

Rate of caesarean sections has been increasing over a period of time both in developed and developing countries. Today, it is one of the most commonly performed surgical procedures, and despite advances in surgical technique and safer anesthesia, it is still associated with a higher maternal morbidity. Due to a rise in the rates of

primary caesarean section globally, repeat cesarean section has also become very common. As cesarean birth rates continue to rise, increasingly obstetricians are faced with the choice of planning a vaginal or cesarean birth after a previous cesarean birth.[1] In an attempt to reduce the rising trend of caesarean delivery worldwide, obstetrician now offer trial of labor more readily to women who have had a caesarean section.[2-4] Several studies both in developed and developing countries have shown that it is not only feasible but safe.[4-7] Among women who attempt a trial of labor after a previous cesarean section, 60% to 80% have a vaginal delivery,[8-11] and morbidity is lower among women who have a vaginal delivery after a previous cesarean section than among women who elect to undergo a second cesarean section.[9,12,13] Although trial of labor is usually successful and relatively safe, it may occasional be associated with severe maternal morbidity and even mortality and correct management represents one of the most significant and challenging issues in obstetric practice.[4, 7] With this background the study was conducted prospectively to study the maternal morbidity and mortality amongst women who underwent a trial of labor after a previous cesarean delivery at tertiary care teaching hospitals in India.

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 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 (TOL) or an elective repeat cesarean section (El-RCS) as the mode of delivery. The first group (TOL) was further subdivided into women who successful trial of labor (S-TOL) and women who had a failed trial of labor (F-TOL) and had to undergo an emergency cesarean section. Both groups (S-TOL and F-TOL) were compared with regard to any type of maternal morbidity, uterine rupture/dehiscence, and emergency interventions like blood transfusion and hysterectomy. The data collected were coded and fed into the computer using Epi-Info and analyzed using SPSS V 19.0. Descriptive statistics such as mean, standard deviation and percentage were used and to find association chi square test was used.

RESULTS

Of the 15664 women with a previous cesarean section, 4035 (25.8%) women underwent a trial of labor (TOL) and an elective repeat cesarean section (El-RCS) was carried out in 5399 (34.5%) cases. For various indications, an emergency repeat cesarean section was carried out on the remaining 6230 (39.7%) women. Among the women who underwent a TOL, 2513 (62.0%) had a S-TOL while in 1522 (38.0%) women, there was a failed trial of labor (F-TOL) requiring an emergency repeat cesarean section. The total number of women who therefore underwent an emergency repeat cesarean section was 7752. (Fig 1)

There was no significant difference (P=0.98) in the mean age of women with F-TOL (26.0±3.8 years) and S-TOL (25.9±3.8 years). Majority of the cesarean section in women with F-TOL(81%) and S-TOL (80.4%) were done in the age group 20-30 years. The mean parity of women who had F-TOL was 1.2±0.6 and the value for those who had S-TOL was 1.5±0.8. The difference was statistically significant (P=0.00). A trial of labor was more likely to fail in 80% if the infant weight was 2500 g or more. (Table 1)

There was a statistically significant difference (P=0.00) in any maternal morbidity which was found higher among women who underwent F-TOL (34%) as compared to S-TOL (2.3%). Blood

loss more than 1000 ml was seen in 314 (20.60%) women with F-TOL and was significantly higher than that seen in 7 (0.3%) women with S-TOL (OR: 0.01, CI: 0.0-0.02, p=0.00). Similarly, a significantly higher proportion of women with F-TOL received blood transfusion (7.0%) in contrast to women with S-TOL (0.8%) (OR: 0.24, CI: 0.16-0.34, p=0.00). Dehiscence of scar in F-TOL was present in 82 (5.4%) cases as compared to 6 (0.2%) in S-TOL and was highly significant (OR: 0.04, CI: 0.02-0.1, p=0.00). Post-operative/ delivery complications were present in 104 (6.8%) women who had F-TOL whereas it was only seen in 10 (0.4%) women with S-TOL(OR: 18.36, CI: 9.22-37.67, p=0.00). Uterine rupture was 0.7% versus 0.1% in F-TOL and S-TOL respectively (OR: 0.12, CI: 0.02-0.59, p=0.001). Maternal death was reported in 4 (0.3%) cases of F-TOL as compared to 6 (0.2%) cases in S-TOL (p=0.45) which was not statistically significant. The average duration of hospital stay for S-TOL was significantly less (4.5±3.9 days) as compared to(10.6±5.0) days for F-TOL and was highly significant (p=0.000)(Table 2). There was no significant difference in the rates of admission to a neonatal intensive care unit between the two groups. It was 12.5% in F-TOL whereas it was11.0% in children born after S-TOL (OR: 1.15, CI: 0.94-1.41, p=0.16).However, child death reported after F-TOL was27 (1.8%) as compared to 65 (2.6%) in S-TOL cases which was highly significant (P=0.00).

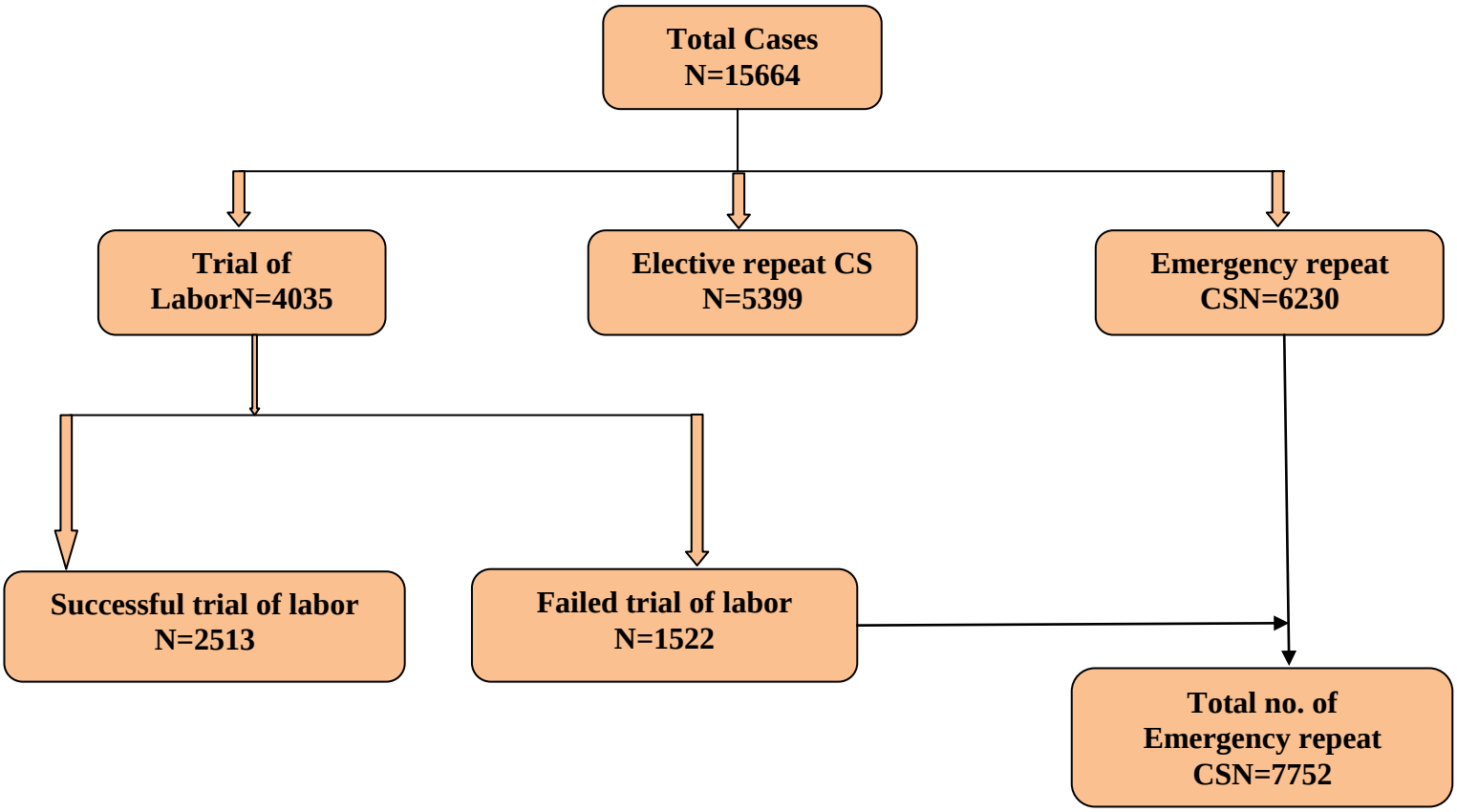

Figure 1: Diagrammatic representation of the selection of the study population.

Table 1. Characteristics of pregnant women who failed to deliver vaginally after a trial of labor and those who delivered successfully vaginally after a trial of labor

Characteristics	Failed trial of labor (F-TOL) (N=1522)	Successful trial of labor (S-TOL) (N=2513)	Odds Ratio/ 95% Confidence interval	P-value
Maternal age (Yrs)				
<=19	12 (0.8)	22 (0.9)	0.90 (0.42-1.92)	0.77
20-24	565 (37.1)	923 (36.7)	1.02 (0.89-1.16)	0.80
25-29	667 (43.8)	1098 (43.7)	1.01 (0.88-1.15)	0.94
30-34	223 (14.7)	382 (15.2)	0.96 (0.80-1.15)	0.64
>=35	55 (3.6)	88 (3.5)	1.03 (0.72-1.40)	0.85
Mean±Sd	26.0±3.8	25.9±3.8		0.98
Parity				
2	1267 (83.2)	1601 (63.7)	2.83 (2.41-3.33)	0.00
3	205 (13.5)	693 (27.6)	0.41 (0.34-0.49)	0.00
4	35 (2.3)	166 (6.6)	0.33 (0.22-0.49)	0.00
5	8 (0.5)	42 (1.7)	0.31 (0.13-0.7)	0.001
>5	7 (0.5)	11(0.4)	1.05 (0.36-2.95)	0.92
Mean±Sd	1.2±0.6	1.5±0.8		0.00
Booking Status				
Booked	1050 (69.0)	1570 (62.5)	1.34 (1.16-1.54)	0.00
Unbooked	472 (31.0)	943 (37.5)		
Infant's birth weight				
<2500	266 (17.5)	722 (28.7)	0.53 (0.45-0.62)	0.00
2500-2999	572 (37.6)	1058 (42.1)	0.83 (0.72-0.95)	0.004
3000-3499	517 (34.0)	588 (23.4)	1.68 (1.46-1.95)	0.00
3500-3999	142 (9.3)	104 (4.1)	2.38 (1.82-3.13)	0.00
>=4000	18 (1.2)	13 (0.5)	2.30 (1.06-5.02)	0.002
Not known	7 (0.5)	28 (1.1)		0.00

Table 2. Morbidity in pregnant women who failed to deliver vaginally after a trial of labor and those who delivered successfully vaginally after a trial of labor

MORBIDITY	Failed trial of labor (F-TOL) (N=1522)	Successful trial of labor(S-TOL) (N=2513)	Odds Ratio/ 95% Confidence interval	P-value
Any morbidity	517 (34.0)	57 (2.3)	0.05 (0.03-0.06)	0.0
Anaesthetic complication	16 (1.1)	0 (0.0)	-	-
Dehiscence of the scar	82 (5.4)	6 (0.2)	0.04 (0.02-0.1)	0.0
Uterine rupture	10 (0.7)	2 (0.1)	0.12 (0.02-0.59)	0.001
Blood loss>1000 ml	314 (20.6)	7 (0.3)	0.01 (0.0-0.02)	0.00
Broad ligament hematoma	3 (0.2)	0 (0.0)	-	-
Blood transfusion	107 (7.0)	44 (.8)	0.24 (0.16-0.34)	0.0
Hysterectomy	1 (0.1)	2 (0.1)	0.83 (0.03-11.71)	0.88
Post-operative/delivery complication	104 (6.8)	10 (0.4)	18.36 (9.22-37.67)	0.0

DISCUSSION

Cesarean section can be a lifesaving procedure when medically indicated and is an important indicator of the ability to provide comprehensive obstetric and neonatal care. However, over utilization of this procedure is a growing concern. Over the past decade there has been a gradual increase in the rate of cesarean section even in the developing countries causing considerable concern. In USA rate of abdominal delivery was 29.1%, in England 21.5%, Latin American States it was 40%[14] and 28.1% in tertiary care teaching hospital in India. These concerns are due to the undesirable effects of 'unnecessary' cesarean sections on the health of the mother and child and the economic and health systems impact.

The overall maternal morbidity in our study was 34.0%, 2.3% in F-TOL and S-TOL respectively. For women with a previous cesarean delivery, S-TOL was generally associated with lower

morbidity than scheduled repeat procedures. However, F-TOL were associated with increased rates of the morbidities compared with scheduled repeat procedures, which is consistent with many other studies.[16-18] In this study any morbidity after S-TOL was 2.3% while in F-TOL it was 34.0% which was highly significant (p=0.00). Maternal death was reported in 0.3% cases of F-TOL as compared to 0.2% cases in S-TOL (p=0.45) which was not statistically significant. The average duration of hospital stay for S-TOL was 4.5±3.9 days as compared to F-TOL 10.6±5.0. This shows that women who had a S-TOL had a significantly lesser duration of hospital stay as compared to those had a cesarean section (p=0.000 highly significant). The rates of admission to a neonatal intensive care unit was 12.5% versus 11.0% (OR: 1.15, CI: 0.94-1.41, p=0.16 not statistical significant) in F-TOL and S-TOL respectively. Child death reported in F-TOL was 1.8% as compared to 2.6% in S-TOL which was highly significant (P=0.00).Majority of neonates were having NICU admission due to premature rupture of membranes, meconium stained liquor, low birth weight and respiratory distress syndrome. Our study was well comparable with other studies who found that Infants born after successful trial of labor had the lowest rates of NICU admission than those born by failed trial of labor.[19-21] 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.

CONCLUSION

Women who experience failed trial of labor have higher risk of morbidity as compared to those with a successful trial of labor. More accurate prediction for safe, successful trial of labor is needed.

ACKNOWLEDGEMENT

Project co-investigators (in alphabetic order):
Bharti S., Egmore, Chennai; Bhatia P., Kasturba Hospital, New Delhi; Coyaji K.J., KEM Hospital, Pune; Das M.C., Guwahati Medical College, Guwahati; ; Das V., CSMM University, Lucknow; Davar R.G., Sir J.J. Group of Hospital, Mumbai; Devambigai S., Govt. RSRM Hospital, Chennai; Ganguly G., MLN Medical College, Allahabad; Ghosh T.K., P.G.I.M.E.R. & SSKM Hospital, Kolkata; Gopalan S., PGIMER, Chandigarh; Idnani R., LLRM Medical College, Meerut; Kochar S., S.P.Medical College , Bikaner; Kodkany B.S., JLN medical college, Belgaum; Madhini V., Govt. K.G.Hospital, Chennai; Mittal S., AIIMS, New Delhi; Mukherjee J., R.G.Kar Medical College, Kolkata; Naphade P.R., B.J. .Medical College, Pune; Nevrekar P., Goa Med College, Goa; Padmanaban I., Kilpauk Medical College, Chennai; Pagi S.L., SSGS Medical College, Baroda; Patnaik S., SCB Medical College, Cuttack; Rajarajeswari S., Madurai Medical College, Madurai; Salhan S., Safdarjung Hospital, New Delhi; Salvi V., K.E.M. Hospital, Bombay; Sanghamitra M., Eden Hospital, Calcutta; Sharma S., Patna Medical College, Patna; Sharma S., SMGS Hospital, Jammu; Soni I.J.K., GSVM Medical College, Kanpur; Sulekha P.B., SAT Medical College, Thiruvananthapuram; Taly A., SMS Medical College, Jaipur

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kambo I, Bedi N, Dhillon BS, Saxena NC. A critical appraisal of cesarean section rates at teaching hospitals in India. Int J Gynecol Obstet. 2002;79:151-8.
2. Treffers P, Pel M. The rising trend for caesarean birth. BMJ 1993; 307: 1017-1019
3. McMahon MJ, Luther ER, Bowes W, Olshan AF. Comparison of a trial of labour with elective second caesarean section. N Engl J Med 1996; 15:121 – 126

4. Okpere EE, Oronsaye AU, Imoedmhe DAG. Pregnancy and delivery after caesarean section: a review of 494 cases. Tropical Journal of Obstetrics and Gynaecology 1981;3: 45-48
5. American College of Obstetricians and Gynecologists. Guideline for vaginal delivery after previous caesarean birth.Int J Obstet Gynecol 1996; 52; 90-98
6. Cowan RK, Kinch RA, Ellis B, Anderson R. Trial of labour following caesarean delivery. ObstetGynecol 1994; 83: 933-936
7. Iloabachie CC. Delivery after a caesarean section. A review of 836 cases. Tropical Journal of Obstetrics and Gynaecology 1981; 7: 9-10
8. Miller DA, Diaz FG, Paul RH. Vaginal birth after cesarean: a 10-year experience. ObstetGynecol 1994;84:255-8.
9. Flamm BL, Goings JR, Liu Y, Wolde-Tsadik G. Elective repeat cesareandelivery versus trial of labor: a prospective multicenter study. Obstet Gynecol 1994; 83:927-32.
10. Flamm BL, Newman LA, Thomas SJ, Fallon D, Yoshida MM. Vaginal birth after cesarean delivery: results of a 5-year multicenter collaborative study. Obstet Gynecol 1990;76:750-4.
11. Rosen MG, Dickinson JC. Vaginal birth after cesarean: a meta-analysis of Indicat-ors for success. Obstet Gynecol 1990;76: 865-9.
12. Paul RH, Phelan JP, Yeh SY. Trial of labor in the patient with a prior cesarean birth. Am J Obstet Gynecol 1985;151:297-304.
13. Rosen MG, Dickinson JC, Westhoff CL. Vaginal birth after cesarean: a meta-Analysis of morbidity and mortality. Obstet Gynecol 1991;77:465- 70.
14. Shamshad. Features leading to increase caesarean section rate.Gomal J Med Sci 2008; 6 (1): 1-5.
15. Dhillon BS, ChandhiokN, Bharti S, Bhatia P, Coyaji KJ, Das MC, et al. Vaginal birth after cesarean section (VBAC) versus emergency repeatcesarean section at teaching hospitals in India: an ICMR task force study. Int J Reprod Contracept Obstet Gynecol2014;3:592-7.
16. Hibbard JU, Ismail MA, Wang Y,TeC, Karrison T, Ismail MA.Failed vaginal birth After aces are an section: Howriskyisit? Maternal morbidity. Am J Obstet Gynecol 184(7):1365–71; discussion 1371–3.2001.
17. Landon MB, Hauth JC, Leveno KJ, Spong CY, Leindecker S, Varner MW,et al. Maternal and perinatal outcomes associated with atrial of labor after prior cesarean delivery. N Engl J Med 351(25): 2581–9.2004.
18. Macones GA, Peipert J, Nelson DB, Odibo A, Stevens EJ, Stamilio DM,et al.Maternal Complications with vaginal birth after cesarean delivery: Amulticenter study. AmJ Obstet Gynecol 193(5):1656–62.2005.
19. Kamath BD, Todd JK, Glazner JE, Lezotte D, Lynch AM. Neonatal outcomes after elective cesarean delivery. Obstet Gynecol 2009; 113:1231-8.
20. Shah JM, Mehta MN. Analysis of mode of delivery in women with previous one cesarean section. J Obstet Gynecol India 2009; 59:136-9.
21. Jha M. Pregnancy Outcome of Single Previous cesarean Section. Nepal Health Res Counc 2009; 7:25-8.