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PREDICTORS OF OUTCOME OF TRIAL OF LABOUR AFTER PREVIOUS CESAREAN SECTION. A DESCRIPTIVE CROSS-SECTIONAL STUDY

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Cesarean section, failure of trial of labor, TOLAC

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Abstract

Background: *One of the most common surgical procedures performed on women globally is the cesarean section. The increasing number of repeat cesarean deliveries prompted the introduction of the trial of labor after cesarean section (TOLAC). Vaginal birth after cesarean (VBAC) has gradually increased over the past few decades but careful patient selection is necessary due to potential risks for both the mother and the fetus. Evidence from these kinds of studies can help make safe decisions minimize complications from repeated cesarean sections cut down on needless repeat surgeries and reduce healthcare costs.*

Objectives: *To ascertain the frequency of labor trial failure following a prior cesarean section and to pinpoint the reasons behind it.*

Design*: Descriptive cross-sectional Study*

Setting*: Gynecology and Obstetrics Department Ruth K. M. Pfau Civil Hospital Karachi six months after the synopsis was approved.*

Subject and Methods*: The study comprised 313 pregnant moms who had undergone one previous cesarean surgery. After a thorough obstetric history, demographic data, and the cause of the prior cesarean section were recorded, a thorough clinical examination was carried out. During the postpartum recovery period, vital signs, uterine tone, and postpartum bleeding were all thoroughly monitored.*

Results: *- The participants were 26. 21 ± 4. 17 years old on average. In 35. 14 percent (110/313) of the cases TOLAC failure was noted. The primary causes of failure were fetal distress in 23. 64 percent of these patients scar dehiscence in 33. 64 percent and lack of labor progress in 42. 73 percent.*

Conclusion*: The results indicate that women who have had one prior cesarean section should not be automatically barred from attempting TOLAC due to the lack of a prior vaginal delivery. Reducing repeat cesarean rates and related morbidities may be possible with proper selection and monitoring.*

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INTRODUCTION

One of the most common surgical procedures performed on women globally is the cesarean section. The percentage of cesarean deliveries worldwide rose from 6. 7% in 1990 to 19. 1% in 2014 (1). The World Health Organization suggested in 2015 that the ideal rate for cesarean sections should be between five and ten percent. In 2013 the rate of cesarean sections in Pakistan was reported to be 15. 8 percent. This rate varied significantly between rural areas (11. 5 percent) and urban areas (25. 6 percent) as well as between socioeconomic groups (5. 5 percent in lower-income populations and 35. 3 percent in higher-income populations). The issue of repeat cesarean sections following an earlier procedure is further highlighted by the high rate of grand multiparity in the nation. The National Institutes of Health Consensus Conference officially recommended trial of labor after cesarean section (TOLAC) in 1980 to address the rising rates of cesarean sections (2). Even though the number of vaginal births following cesarean sections has steadily increased over the past forty years careful patient selection is necessary due to potential risks to both the mother and the fetus. Maternal obesity fetal macrosomia and advanced maternal age have all been linked to an increased risk of uterine rupture which is still one of the most dangerous complications (3). Shaheen N. et al. revealed in 2014 that TOLAC was successful in 71. 6 percent of cases with a higher failure rate among younger women (mean age: 27. 1±3. 16 years) compared to 30. 3±4. 3 years in successful cases (p0. 001). There was no significant difference in estimated fetal weight between successful trials (3. 0±0. 4 kg) and unsuccessful trials (3. 3±0. 3 kg p=0. 212) (4). Khan & Co. observed a 70 percent success rate of TOLAC among 764 women in 2016 with the main reasons for failure being fetal distress (26 point 99 percent) scar tenderness or dehiscence (33 point 18 percent) and labor progress failure (39 point 82 percent) (5). As a result Raja et al. reported a 67 percent success rate after inducing labor after a prior cesarean section in 2013. There was no statistically significant correlation between maternal age and the mode of delivery but women over 30 had a lower chance of giving birth vaginally (6). Tasleem and others. showed that non-obese women with BMI 30 had a higher TOLAC success rate (82. 06 percent) than obese women with BMI ≥30 (64. 38 percent p0. 001). The main reasons for failure were fetal distress failure to progress scar tenderness and scar dehiscence (7). Higher fetal birth weight was significantly associated with failed TOLAC (p=0. 020) but maternal age or BMI did not significantly affect the outcome according to a 2017 Taiwanese study that found an 84. 93 percent success rate among women undergoing TOLAC. The primary causes of failure in this cohort were fetal distress prolonged labor and unbearable pain (89). Our population still has a very high rate of cesarean sections especially among women who have had a prior cesarean delivery. Women who are more likely to fail can be identified early if factors linked to unsuccessful labor trials are identified. This strategy may lessen the need for needless repeat cesarean sections lessen the financial burden promote evidence-based decision-making and minimize complications associated with multiple surgical deliveries.

Methodology:

This cross-sectional descriptive study was carried out at Ruth K. s Department of Gynecology and Obstetrics. M. Pfau Civil Hospital Karachi between January 2021 and July 2021. The sample size was determined using the WHO sample size calculator at a 95 percent confidence level 5 percent absolute precision and an expected TOLAC success rate of 71. 6 percent. A total of 313 pregnant women were enrolled using non-probability consecutive sampling. Women between the ages of 20 and 40 who had a singleton term pregnancy one prior cesarean section cephalic presentation and an estimated fetal weight of less than 4 kg were included those who had twin gestations cephalopelvic disproportion more than one previous cesarean section fetal distress placenta previa abnormal amniotic fluid volume gestational diabetes or preeclampsia were not. Detailed obstetric history

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demographic information and the reason for the prior cesarean section were documented after receiving ethical approval and written informed consent. This was followed by a comprehensive clinical examination and baseline investigations which included laboratory tests ultrasound and cardiotocography. Every participant was permitted to go into labor on their own and those who did not make enough progress were induced using intravaginal prostaglandin E2 in accordance with protocol. A partogram was used to track labor progress and ongoing surveillance was done to look for signs of scar complications and fetal distress. When necessary an emergency caesarean section was carried out. Mothers were monitored for postpartum hemorrhage uterine tone and vital signs after delivery and breastfeeding was advised. A structured questionnaire was used to collect the data which were then analyzed using SPSS version 23. Means and standard deviations were used for quantitative variables while frequencies and percentages were used for qualitative variables. Relevant maternal and obstetric factors were stratified and associations were evaluated using the chi-square test with a p-value of less than 0. 05 being considered statistically significant.

Results:

This study included 313 pregnant women with a history of one prior cesarean section. Figure 1 depicted the age distribution with a mean age of 26. 21 ± 4. 17 years. Table 1 summarizes further demographic information. As illustrated in Figure 2 poor labor progress was the most common reason for the previous cesarean section followed by non-progress of labor intrauterine growth restriction and other reasons. As shown in Figure 3 a total of 35. 14 percent (110/313) of cases had a failed labor trial following a prior cesarean section. Inadequate labor progress in 42. 73 percent of cases scar dehiscence in 33. 64 percent and fetal distress in 23. 64 percent of cases were the main causes of unsuccessful trials. As shown in Tables 2 and 3 stratified analysis showed no statistically significant correlation between maternal age groups and failure of trial of labor (p = 0. 364) or between age groups and particular causes of TOLAC failure. Only scar dehiscence and fetal distress demonstrated significant relationships with body mass index (p = 0. 012 and p = 0. 011 respectively) when failure rates and underlying causes were evaluated in relation to maternal weight height and BMI. Furthermore as shown in Table 2 the presence of scar tenderness a history of one prior cesarean section and unsuccessful induction were all substantially linked to higher trial of labor failure rates.

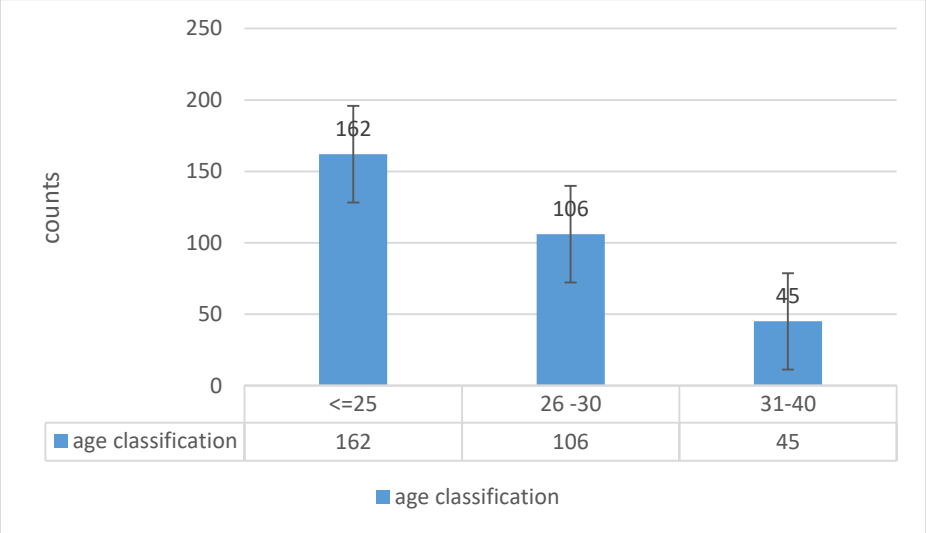


FIGURE 1 Age clasification n=313

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Variables Mean 95% CI for Mean Std. Lower Upper Deviation Age (Years) 26.21 25.75 25.75 4.17 Gestational age (Weeks) 36.42 36.19 36.68 2.23 Weight (kg) 62.80 62.00 63.6 7.18 Height (cm) 152.03 151.41 152.6 5.49 BMI (kg/ m2) 27.18 26.84 27.52 3.02 Estimated Fetal Birth Weight 2.87 2.80 2.95 0.67 Parity 1.82 1.77 1.88 0.49

TABLE 1 Demographic and estimated fetal birth weight of the patients

VARIABLES	MEAN	95% CI LOWER	95% UPPER	STD DEVIATION
AGE (YEARS)	26.21	25.75	25.75	4.17
GASTATIONAL AGE (WEEKS)	36.42	36.19	36.68	2.23
WEIGHT (KG)	62.80	62.00	63.6	7.18
HEIGHT (CM)	152.03	151.41	152.6	5.49
BMI (KG/M^2	27.18	26.84	27.52	3.02
ESTIMATED FETAL WEIGHT	2.87	2.80	2.95	0.67
PARITY	1.82	1.77	1.88	0.49

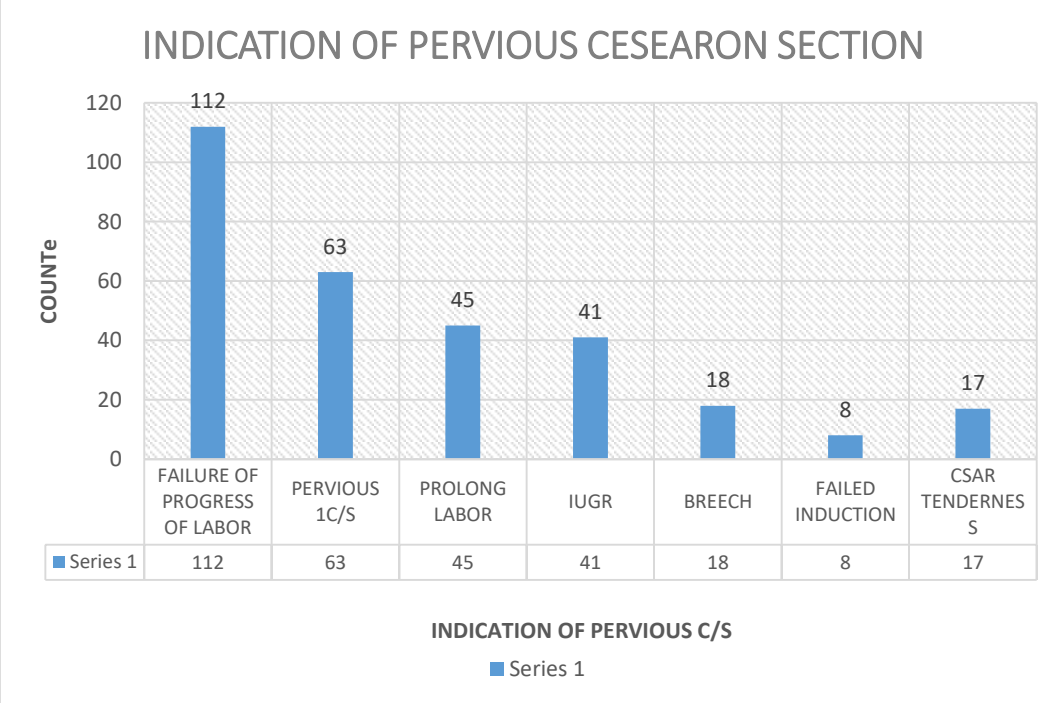


FIGURE 2 Indication of previous cesarean sectio n=313

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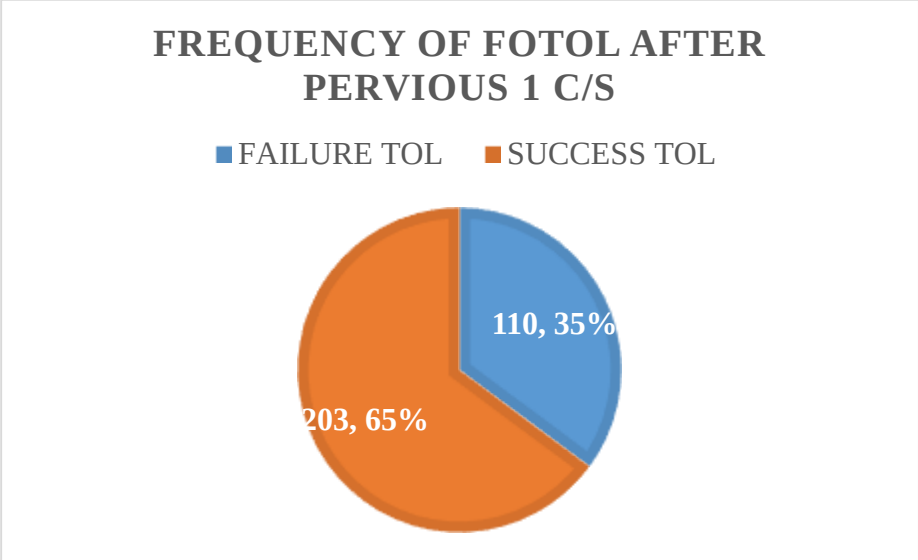


FIGURE 3 Frequency of failure of trial of labor after previous one cesarean section n=313

Previous c/S causes FAILURE OF TRIAL OF LABOR Total P-Value Yes No Breech 7(38.9%) 11(61.1%) 18 0.732 Failed Induction 6(75%) 2(25%) 8 0.017 Failure of progress of labor 16(14.3%) 96(85.7%) 112 0.005 IUGR 19(46.3%) 22(53.7%) 41 0.107 Non progress of labour 20(37%) 34(63%) 54 0.749 Pre 1 C/S 31(49.2%) 32(50.8%) 63 0.009 Scar Tenderness 11(64.7%) 6(35.3%) 17 0.009

TABLE 2 Frequency of failure of trial of labor after previous one cesarean section by previous c/s causes n=313

Previous c/S causes	FAILURE OF TRIAL OF LABOR (YES)	FAILURE OF TRIAL OF LABOR (NO)	TOTAL	P-VALUE
No Breech	7(38.9%) 11(61.1%)	11(61.1%)	18	0.732
Failed Induction	6(75%)	2(25%)	8	0.017
017 Failure of progress of labor	16(14.3%)	98 (85.7%)	112	0.005
IUGR	19(46.3%)	22(53.7%)	41	0.107
Non progress of labour	20(37%)	34(63%)	54	0.749
Pre 1 C/S	31(49.2%)	32(50.8%)	63	0.009
Scar Tenderness	11(64.7%)	6(35.3%)	17	0.009

Discussion

Between 53 and 95 percent of vaginal births following cesarean sections (VBACs) have been reported to be successful [104105]. Women who had a prior cesarean section (CS) for non-recurrent indications like fetal distress or breech presentation typically had higher success rates. However there is an inherent risk of uterine scar rupture with VBAC which could be extremely dangerous for the health of both the mother and the fetus. Therefore before offering a trial of labor after cesarean section (TOLAC) it is still crucial to select candidates appropriately. Although a number of predictive models have been created to determine the probability of a

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successful TOLAC none of them have proven to be consistently accurate. Research indicates that an unsuccessful TOLAC carries greater risks than an elective repeat CS [107] while a successful TOLAC is linked to lower maternal morbidity compared to other modes of delivery for women with a prior low transverse CS [106–108]. It is still difficult to predict successful TOLAC in spite of these worries. When long-term results are taken into account a TOLAC success rate of at least 47% seems more cost-effective than elective repeat CS [10]. TOLAC has been demonstrated to be more economical than planned repeat CS [109]. The average age of participants in this study was 26. 21±4. 17 years. Shaheen et al. published similar results. With a mean age of 27. 1±3. 16 years women who failed TOLAC were comparatively younger. The likelihood of a successful TOLAC is strongly influenced by the indication for the initial CS as prior research has repeatedly demonstrated. VBAC success rates are lower in women whose previous CS was caused by labor dystocia or failure to progress than in women whose CS was caused by non-recurring factors like breech presentation or fetal distress [11]. One of the best indicators of a successful TOLAC is a prior vaginal delivery. There is little data on labor induction in women with a history of CS due to failed induction or labor dystocia [10] despite the fact that pre-labor nomograms have been proposed to estimate VBAC success [9]. After one prior CS the TOLAC failure rate in our study was 35. 14 percent. Shaheen N. and others. found that in 2014 the success rate was 71. 6 percent and the failure rate was 28. 4 percent (12). As a result Place et al. reported a 72. 9 percent vaginal delivery rate (13). The three main reasons for TOLAC failure in the current study were fetal distress (23. 64 percent) scar dehiscence (33. 64 percent) and failure to progress (42. 73 percent). Khan et al. reported comparable findings. who found a 70% success rate in 2016 with fetal distress (26. 99 percent) scar tenderness or dehiscence (33. 18 percent) and poor labor progress (39. 82 percent) being the main causes of failure. The Raja et al. additionally revealed a 67% success rate for women undergoing labor induction following a prior CS with a repeat CS rate of 27. 1% because of labor dystocia or a failed induction (14). In line with what we discovered Khan et al. emphasized the same reasons why TOLAC failed in 2016 (15). Raja as well. found that although women over 30 had a lower chance of VBAC success maternal age did not statistically significantly correlate with the mode of delivery (16). Maternal age did not significantly correlate with either the rate of TOLAC failure or its causes in our study. This finding is corroborated by a 2017 Taiwanese study that found no significant correlation between outcome and maternal age or body mass index and reported an 84. 93 percent TOLAC success rate (17). With mean weights of 3. 21±0. 38 kg in successful cases and 3. 47±0. 48 kg in failed cases higher fetal birth weight was significantly linked to unsuccessful TOLAC (p=0. 020). Failure in that cohort was found to be significantly influenced by fetal distress prolonged labor and unbearable pain (18). In the current study women whose estimated fetal weight was greater than 2. 7 kg had a significantly higher rate of TOLAC failure. Tasleem et al. documented similar patterns. in 2016 who showed that non-obese women with BMI 30 had higher success rates than obese women with BMI ≥30 (82. 06 percent vs. 64. 38 percent p0. 001). The main reasons for unsuccessful TOLAC were fetal distress failure to progress scar tenderness and scar dehiscence (19).

Conclusion

In conclusion poor labor progress uterine scar dehiscence and fetal distress were found to be the primary causes of labor trial failure in 35. 14 percent of cases following a prior cesarean section. Appropriate patient selection and prompt decision-making can be facilitated by early identification of risk factors. In women who have had one previous cesarean section the lack of a prior vaginal birth should not be regarded as a barrier to a labor trial because a closely monitored approach may help lower the number of repeat cesarean deliveries and related maternal complications.

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