

Factors Associated with Vaginal Birth after Previous C-Section in Pregnant Women

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ABSTRACT:

Introduction: The cesarean delivery (CD) rate has increased significantly over recent decades. It is estimated that almost a third of women have delivered by CD worldwide. In most countries, the caesarean section rate (CSR) has exceeded the level of 10–15% recommended by the World Health Organization (WHO). In different areas of Pakistan current CSR was 16–20%, approximately.

Objective: To determine the frequency of successful vaginal birth after previous cesarean section (VBAC) and factors associated with failed VBAC and fetomaternal outcome after trial of labour after cesarean section (TOLAC) in pregnant women.

Study Design: This descriptive cross sectional study was conducted in the department of Obstetrics & Gynaecology of Civil Hospital Karachi for the duration of six months from July, 2020 to January, 2021.

Subjects and Method: The pregnant women who had a prior cesarean delivery and the intension to desire a TOLAC at the prenatal visit at 36 weeks were recruited according to inclusion and exclusion criteria. Trial of labor was assessed of all women and the outcome of successful VBAC after attempted TOLAC was noted and associated factors.

Results: Total numbers of patients included in study were 142. Out of which 97 (68.3%) had successful vaginal delivery after previous C-section and 45 (31.6%) were failed VBAC. Regarding the Factors associated with Successful VBAC in pregnant women, 83 (85.5%) had normal BMI, 94 (96.9%) had Gestational age b/w 37th to 40 weeks, 93 (95.8%) were booked cases, 51 (52.5%) were working women, 87 (89.6%) had h/o of VBAC, 81 (83.5%) had Interval time from previous CS > 18 months and 96 (98.9%) had normal birth weight

Conclusion: Majority of the cases of previous CS done can be delivered safely by the vaginal route, without any major 3 complication to the mother and the newborn, in an institution having facilities for emergency CSs.

Keywords: Trial of labor, vaginal birth after cesarean section, induction of labor.

INTRODUCTION

The cesarean delivery (CD) rate has increased substantially over recent decades. It is estimated that almost a third of women have delivered by CD worldwide [1]. In most countries, the caesarean section rate (CSR) has exceeded the level of 10–15% recommended by the World Health Organization (WHO) [2]. Similarly, in low income countries, CSR is increasing on a yearly basis [3]. In different areas of Pakistan a current CSR was 16–20%, approximately [4]. Pregnant women with a previous caesarean section may be offered either planned vaginal birth after Caesarean (VBAC) or elective repeat caesarean section (ERCS). Pregnant women face the decision of having an elective repeat cesarean delivery (ERCD) or attempting VBAC, also called trial of labor after cesarean delivery (TOLAC) [5,6]. Although attempts at a Trial of Labor after a Cesarean Birth (TOLAC) have become accepted practice, the rate of successful vaginal birth after cesarean delivery, 5 as well as the rate of attempted VBACs, has decreased during the past 10 years. Concerns about immediate maternal and neonatal complications associated with uterine rupture have contributed to a decrease in vaginal birth after CS rates [7]. Raja JF et al. conduct the study in 2013 and reported that 30% women had vaginal delivery after the previous caesarean section [8]. Zaitoun MM et al [7] reported that socio demographic characteristics more than one third (34.8%) of women were in the age of 25 to less than 30 years old, with a mean age was 29.9 ± 5.3 years. (82.4%) had secondary and university level of education and only 1.6% were illiterate (53.6%) of women were working. Women who had successful VBAC were more likely to have low parity (≤ 3) compared to those in the ERCS (90.2% vs 76.8% respectively). 94.2% of VBAC group had a gestational age between 37th and less than 40 weeks compared to 41.1% in the ERCS group. 61.9% of the successful VBAC group had vaginal delivery in their last delivery vs. 26.8% of the ERCS group (p=0.000). The incidence of successful VBAC was significantly higher in women who had a history of prior vaginal delivery, compared to those who had not (71.1% & 28.9%, respectively).

Women in the VBAC group were more likely to have longer spacing period (≥ 18 months) between their previous CS and their present pregnancy compared to those in the ERCS group (74.1% vs. 63.2%, respectively) (t=7.3 & P=0.000). Women in the successful VBAC group had two previous successful attempted VBAC (38.2%) compared to those in the ERCS group (14.3%) [7]. Failure of labour progress was the most common indication for CS (39.3%), followed by macrosomia (28.6%), and fetal distress (10.7%) in the ERCS group compared to, women in the successful VBAC group (3.7%, 23.8% and 2.5% respectively). Women in the successful VBAC group were more likely to have spontaneous rupture of membranes and the amniotic fluid being clear than those in the ERCS group (87.1 & 97.4% vs. 37.5% & 78.5% respectively) (p=0.000). Women with ERCS were more likely to suffer from postpartum haemorrhage (8.9%) and to receive blood transfusion (7.1%) compared to women who had successful VBAC (2.1% and 1.5% respectively). Predicting the chance of a successful TOLAC has been a clinically important topic since a successful TOLAC is associated with a decreased risk of future pregnancy complications and a shorter postpartum recovery time with fewer complications. Success rates of TOLAC were approximately between 60 and 90% and were associated with multiple factors [9,10]. Any prior vaginal delivery, vaginal delivery after prior cesarean, indication for cesarean, maternal body mass index (BMI), estimated gestational age (EGA), booking status, occupation. Maternal height and 7 interval time from prior cesarean can also affect the success of TOLAC [12,13]. Pregnant women with a prior cesarean should receive appropriate counseling concerning VBAC versus elective repeat cesarean in order to make an informed decision. This counseling would presumably include individualized risk-benefit assessment of trial of labor with likelihood of successful VBAC [14–18]. Grobman et al [19] in 2007, developed the model, which has been most commonly utilized and validated in a similar heterogeneous population of the United States. Since Pakistani demographic and clinical characteristic are different, so this model has not been utilized or validated in the Pakistani population. In

this study, we developed a new model in which Pakistani demographic and clinical factors were investigated to predict successful TOLAC in our population about counseling of VBAC according to Pakistani culture.

MATERIALS AND METHODS

This descriptive cross sectional study was conducted at department of Gynecology and Obstetrics, Civil hospital Karachi for the duration of six months from July, 2020 to January, 2021. By using WHO sample size calculator taking prevalence of women having successful vaginal birth after previous cesarean section that is (38.2%). Confidence level 95%, margin of error 8%, so sample size was 142 and Non-Probability Consecutive sampling 52 methods was used for sampling techniques.

Inclusion Criteria

- Age 18-40 years
- Women with previous one lower segment caesarean section
- Parturient women, who desired and accepted the trial of VBAC
- Having single viable fetus
- With vertex presentation at the onset of labour
- Having spontaneous onset of labour

Exclusion criteria

- Cephalopelvic disproportion
- Previous two or more cesarean section
- Past history of uterine rupture
- Intrauterine fetal demise before delivery,
- Multiple gestation
- Any indication for elective cesarean section in the current pregnancy related to fetal mal-presentation, placenta previa.

Data Collection Procedure: This study was conducted after approval of college of physician and surgeon Pakistan. The pregnant women who had a prior CD and the 53 intension to desire a TOLAC at the prenatal visit at 36 weeks were recruited according to inclusion and exclusion criteria. Written informed consent was also obtained from all parturient at the first prenatal visit. Abdominal, vaginal examination was taken. The variables include maternal age, gestational age, BMI, residency status, occupation, education status, prior vaginal delivery, prior VBAC, indication of prior cesarean section, spacing between previous CS and current pregnancy, pre-eclampsia (yes/no), cervical effacement at admission (10%), cervical dilation at admission (cm), induction of labor (yes/no) Complications of current pregnancy, Apgar scores, birth weight, fetal monitoring assessment, and prior uterine layer closure was also observed. Cardio tocography was done for every parturient woman to assess the fetal heart rate and uterine contraction. All these variables can be ascertained at the antenatal visit. Trail of labor was assessed of all women and the outcome of successful VBAC after attempted TOLAC was noted. All information was collected on the predesigned proforma.

Data Analysis: Data was analyzed by Statistical packages for social science version 17 (SPSS Inc., Chicago, IL). Mean and standard deviation was computed for age, weight, height, BMI, cervical effacement at 54 admissions, cervical dilation at admission. Frequency and percentage were computed for qualitative variable like BMI, occupation, history of prior vaginal delivery after cesarean, indication for prior cesarean, normal birth weight, induction of labor, amniotic fluid volume abnormality, prolonged pregnancy ≥ 42 weeks and outcome trial of labour. Effect modifiers like age, residence, ethnicity and education were controlled through stratification. Post stratification chi square test was applied by taking P values ≤ 0.05 as significant.

RESULTS

Age range in this study was from 18 to 40 years with mean age was 32.7 ± 9.3 years, mean height was 155.67 ± 14.14 m and mean weight was 68.56 ± 12.77 kg, mean BMI was 27.65 ± 6.05 (kg/m²), mean cervical effacement at admission was $85.15 \pm 19.41\%$ and mean cervical dilation at admission was 8.65 ± 3.05 , shown in table # 01.

Table 1:

	Mean + SD
Age	32.7 ± 9.3
Height	155.67 ± 14.14
Weight	68.56 ± 12.77
BMI	27.65 ± 6.05
Cervical effacement at admission	85.15 ± 19.41
Cervical dilation at admission	8.65 ± 3.05

68 (48.1%) were illiterate, 57 (40.1%) had primary education, 13 (9.15%) had secondary education and 4 (2.8%) had higher education, shown in table # 02.

Table 2:

Educational status	Frequency	Percentage
Illiterate	68	48.1%
Primary	57	40.1%
Secondary	13	9.15%
Higher	4	2.8%

16 (11.2%) of the patient had induction of labour, 32 (25.5%) had Amniotic fluid volume abnormality and 12 (8.5%) had prolonged labor, shown in table # 3.

Table 3:

Induction of labor	Frequency	Percentage
Yes	16	11.2%
No	126	88.8%
Amniotic fluid volume abnormality	Frequency	Percentage
Yes	32	22.5%
No	110	77.5%
Prolonged pregnancy > 42 weeks	Frequency	Percentage
Yes	12	8.5%
No	130	91.5%

98 (68.3%) had successful vaginal delivery after previous Csection, shown in table # 16. Regarding the Factors associated with Successful VBAC in pregnant women, 83 (85.5%) had normal BMI, 94 (96.9%) had Gestational age b/w 37th to 40 weeks, 93 (95.8%) were booked cases, 51 (52.5%) were working women, 87 (89.6%) had h/o of VBAC, 81 (83.5%) had Interval time from previous CS > 18 months and 96 (98.9%) had normal birth weight, shown in table # 4.

Table 4:

SVD	Frequency	Percentage
Yes	97	68.3%
No	45	31.6%
Factors	Yes n (%)	No n (%)
Normal BMI	83 (85.5%)	14 (14.5%)
Gestational age b/w 37th to 40 weeks	94 (96.9%)	3 (0.03%)
Booked cases	93 (95.8%)	4 (4.4%)
Working women	51 (52.5%)	46 (47.4%)
H/o of VBAC	87 (89.6%)	10 (10.4%)
Interval time from previous CS > 18 months	81 (83.5%)	16 (16.4%)
Normal birth weight	96 (98.9%)	1 (1.1%)

57 When SVD after previous C-section in pregnant women was stratified with respect to age groups, residential status,

ethnicity and educational status, no significant difference was observed, shown in **table # 5**.

Successful SVD	Age				P-value				
	18 to 30 years (n=70)		30 to 40 (n=72)						
Yes	51		46		0.167				
No	19		26						
Successful SVD	Residential status				P-value				
	Urban (n=89)		Rural (n=53)						
Yes	59		38		0.316				
No	30		15						
Successful SVD	Ethnicity				P-value				
	Urdu (n=46)		Punjabi (n=10)			Sindhi (n=72)		Other (n=14)	
Yes	31		6		49		11		0.796
No	15		04		23		03		
Successful SVD	Educational status				P-value				
	Illiterate (n=68)		Primary (n=57)			Secondary (n=13)		Higher (n=4)	
Yes	49		38		08		02		0.704
No	19		19		05		02		

Factors responsible for Successful VBAC were also stratified with respect to age, residential status, ethnicity and educational status, in most of the cases, no significant difference was observed, however, in some cases, significant difference was observed.

DISCUSSION

With the significant rise in the incidence of primary CS for various indications, an increasing proportion of the pregnant women coming for antenatal care report with a history of a previous CS. These women belong to a high-risk group due to the risk of a scar rupture. The obstetrician is always in a dilemma regarding the mode of delivery in these cases. Assessment of the individual case with regard to the possibility of a successful VBAC is necessary while taking the decision. This study indicates that the success rate of VBAC (approximately 68.3%) is in comparison to that of several previous publications (60-75%) [1, 4-7]. Interestingly, the success rate dropped from approximately 80% at the beginning of the policy to only 50% in recent years in spite of the same standard practice guideline. Moreover, the rate of women accepting VBAC also drastically decreased from 54% in the year 2001 to only 21% in 2015. [19] Factors associated with Successful VBAC in pregnant women, 83 (85.5%) had normal BMI, 94 (96.9%) had Gestational age b/w 37th to 40 weeks, 93 (95.8%) were booked cases, 51 (52.5%) were working women, 87 (89.6%) had h/o of VBAC, 81 (83.5%) had Interval time from previous CS > 18 months and 96 (98.9%) had normal birth weight, which are in line with the majority of the studies conducted in past [16, 20, 21] but our results are also in contradiction with few of the studies [11,22]. The reason may different sample size, different population and most of the studies were retrospective so there may 85 be a significant chance of biasness as researcher must relied on data collected by others which were not designed for the study, so the available data may be of poor quality. The rates of acceptance and success of TOLAC sharply dropped after the years of the audit system. Certainly, such a rapid decrease from 2003 to 2004, followed by constantly low rates with minimal change after that, could not be explained by scientific reasons or other factors, neither global trend of increase in cesarean rate nor the change in clinical practice during the study period. Though other unknown factors could be responsible for the lower rate of TOLAC in recent years, our finding indicates that by working on above factors, success rate of VBAC can be increased. It is noteworthy that our success rate in the most recent years was low (68.3%), when compared to a success rate of 60%–80% reported in most high resource countries [1]. We believe that, under strict supervision and careful selection, VBAC is a very good option even in low-resource setting, as demonstrated by Soni A et al. [8]. Though some studies in low-income countries have shown a much lower success rate of VBAC, ranging from as low as 27.4%

to 53.6% [9, 10], studies in some other low-income countries showed a high rate of successful TOLAC with strengthening and careful selection (79.6-83.5%) [5, 8], which is consistent with our finding in the year of audit. Many reasons for the low rate in low-income countries have been postulated, e.g., delay in access to health care service, unavailability of painless labor, lack of constant availability of operating rooms in cases of emergency, poor educational status, great number of cases with unknown previous uterine scar, and poor record keeping of previous cesarean delivery.

CONCLUSION

Majority of the cases of previous CS done 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 CSs. It has been proved to be a safe alternative to repeat an elective CS. Furthermore, the new insight gained from this study is that the almost all the factors under investigation are powerful associated with a successful VBAC. Thus strategies should be made to 88 strengthen and improve the associated factors for successful outcome.

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