

# Clinical Assessment and Pregnancy Outcome in Women with Vaginal Birth after Caesarean Section and to Evaluate the Factors for Successful Outcome in Vaginal Birth after Caesarean Section: A Cross Sectional Observational Study in a Tertiary Care Hospital of Assam

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**Abstract:** Background: The rate of primary caesarean section is on the rise. More and more women report with a history of a previous caesarean section. A trial of vaginal delivery can save these women from the risk of repeat caesarean section. The present study aims to assess the factors for successful outcome in vaginal birth after caesarean section. Methods: A total of 78 cases with a previous history of Caesarean section were included in the study. Parameters assessed were maternal age, maternal body mass index, baby's weight, history of prior vaginal delivery, indications for caesarean section and complications. Results: Significant associations were found between successful vaginal birth after caesarean section and younger maternal age, lower maternal BMI, normal weight of new-born and experience of prior vaginal delivery. The present study has found that, among the women who underwent caesarean section, 55.0% had intact scar, 15.0% had scar rupture and 30.0% had impending scar rupture. Among these women, majority had the indication of impending scar rupture while others had meconium stained liquor, scar rupture, foetal distress and prolonged labour. Conclusion: The present study has found certain factors such as maternal age, maternal BMI, baby's weight and prior vaginal delivery which are significantly associated with successful outcome in vaginal birth.

**Keywords:** Caesarean section, VBAC, trial of labour, scar rupture, foetal distress

## 1. Introduction

With the dramatic increase in caesarean section rates all over the world, the old myth "Once a caesarean always a Caesarean" is no longer acceptable. Hence, there is a change all over the world leading to increased practice of attempting TOLAC and VBAC. Vaginal birth after caesarean (VBAC) has received a lot of attention recently due to the worldwide increase in caesarean deliveries. The danger of uterine rupture, foetal death, and maternal morbidity are the main concerns during trial of labour after caesarean (TOLAC). The worry of these dangers had a part in both the decline in TOLAC sections and the rise in caesarean sections. A well-planned VBAC is a safe option for patients who have had a single previous lower-segment caesarean section (LSCS), according to a consensus among numerous associations, including the National Institute for Health and Care Excellence, Royal College of Obstetricians and Gynaecologists, American College of Obstetricians and Gynaecologists, and National Institutes of Health. [1] The health economic modelling is in favour of this approach. [2] Additionally, it can lower the frequency of subsequent caesarean deliveries and the maternal morbidity brought on by numerous caesarean deliveries. [3-5]

Age, gestational age, Bishop's score, body mass index (BMI), type of labour, previous vaginal birth, and predicted

foetal weight are only a few of the variables that can predict the likelihood of a successful VBAC, but when taken individually, their significance is greatly diminished. The majority of research on the success or failure rate of TOLAC comes from industrialised nations, and this data cannot be generalised to developing nations like India because they have different ethnologies, physical characteristics, and medical infrastructure. [6]

The present study was conducted to evaluate the demographic and obstetrical factors associated with successful outcome in vaginal birth after caesarean section.

## 2. Materials and Methods

### Sampling:

This prospective observational study was carried out at a tertiary care hospital in Assam from June 2022 to November 2022. After obtaining institutional ethical committee approval and informed consent, a total of 78 cases with a previous history of Caesarean section were included in the study. Pregnant women with one caesarean section were included in the study. Pregnant women with more than one caesarean section, pregnant women who are preterm and women with prior caesarean section less than 3 years back were excluded from the study.

**Methodology:**

A counselling session for the women was conducted regarding the potential benefits of VBAC and also about the possible complications that can arise due to it. A detailed history including medical and surgical history was taken on admission and thorough physical examination was done for all the study participants. Basic laboratory investigations were carried out that includes haemoglobin, Blood grouping. Availability of the blood was checked with the blood bank and blood was kept cross matched and ready in the blood bank for all the cases to undergo Trial of Labour (TOLAC). Ultrasonography was done to assess the foetal wellbeing. Intravenous line was maintained by wide bore cannula. They were closely monitored in terms of vitals, uterine contractions, foetal heart rate, vaginal bleeding and haematuria. Outcomes were assessed in terms of Uneventful VBAC, Rate of caesarean Section, Scar integrity and condition of neonate. Factors favouring VBAC in terms of age, BMI, Prior vaginal delivery, Baby weight were evaluated.

**Statistical analysis:**

The data are tabulated in Microsoft excel and analysed with SPSS V.24 software. The variables are presented with frequency and percentage. Chi square test was used for the statistical analysis. The p value  $\leq 0.05$  is considered statistically significant.

**3. Results**

Among the 78 women, 58 had vaginal delivery and 20 had caesarean section. Majority of the women who underwent vaginal delivery were from the age group of 20-30 years (96.6%) and majority of the women who underwent caesarean section were from the age group of >30 years (70.0%). Chi square test shows that this association is statistically significant ( $p < 0.001$ ) (Table 1, Figure 1).

Majority of the women who underwent vaginal delivery were having BMI within normal range (98.3%) and majority of the women who underwent caesarean section were overweight (55.0%) along with 15.0% under obesity class I. Chi square test shows that this association is statistically significant ( $p < 0.001$ ) (Table 2, Figure 2).

Although, majority of the women in both the groups had babies with weight from 2.5 to 3 kg, among the women who underwent caesarean section, 30.0% had babies with weight from 3 to 3.5 kg and 5.0% had babies with weight >3.5 kg which is in contrast to 8.6% of the women who underwent vaginal delivery who had babies with weight from 3 to 3.5 kg. Chi square test shows that this association is statistically significant ( $p = 0.016$ ) (Table 3, Figure 3).

Among the women who underwent successful VBAC 29.3% had prior vaginal delivery but none (0.0%) the women who underwent caesarean section had prior vaginal delivery. Chi square test shows that this association is statistically significant ( $p = 0.006$ ) (Table 4, Figure 4).

Among the women who underwent vaginal delivery, only 1 had vascovaginal fistula, 2 had postpartum haemorrhage and baby of 1 mother was admitted to NICU. Among the women who underwent caesarean section, 3 had rupture uterus and babies of 11 women were admitted to NICU (Table 5, Figure 5).

Among the women who underwent caesarean section intraoperatively 55.0% had intact scar, 15.0% had scar rupture and 30.0% had impending scar rupture (Table 6, Figure 6). Among the women who underwent caesarean section, majority had the indication of impending scar rupture (30.0%) followed by meconium stained liquor (25.0%), scar rupture (15.0%), foetal distress (15.0%) and prolonged labour (15.0%) (Table 7, Figure 7).

**Table 1:** Comparison of mother's age between different modes of delivery

Parameter		Mode of Delivery		Total	Chi square value	P value
		Vaginal Delivery	Caesarean section			
Mother's age	20-30 years	N	56	6	40.398	<0.001
		%	96.6%	30.0%		
	>30 years	N	2	14		
		%	3.4%	70.0%		
Total	N	58	20	78		
	%	100.0%	100.0%	100.0%		

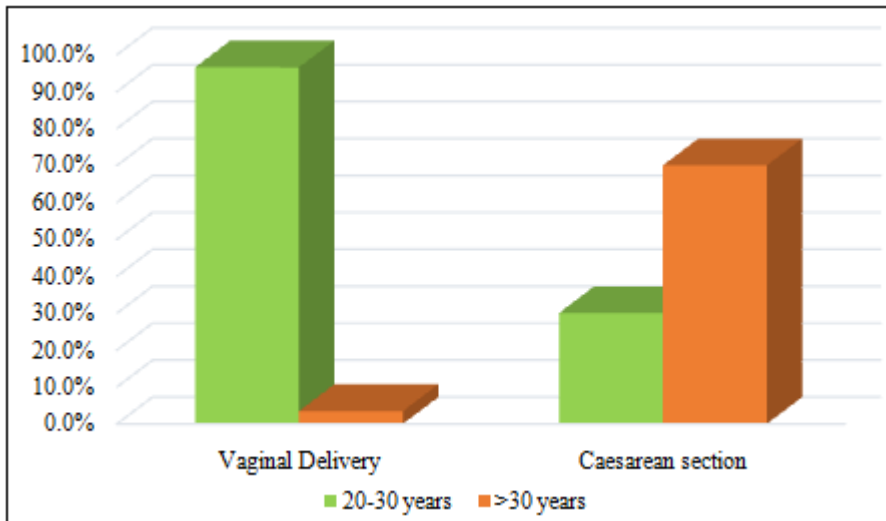


Figure 1: Comparison of mother's age between different modes of delivery

Table 2: Comparison of mother's BMI between different modes of delivery

Parameter		Mode of Delivery		Total	Chi square value	P value	
		Vaginal Delivery	Caesarean section				
Mother's BMI	Normal weight	N	57	6	44.720	<0.001	
		%	98.3%	30.0%			80.8%
	Overweight	N	1	11			12
		%	1.7%	55.0%			15.4%
	Obesity Class I	N	0	3			3
		%	0.0%	15.0%			3.8%
Total		N	58	20	78		
		%	100.0%	100.0%	100.0%		

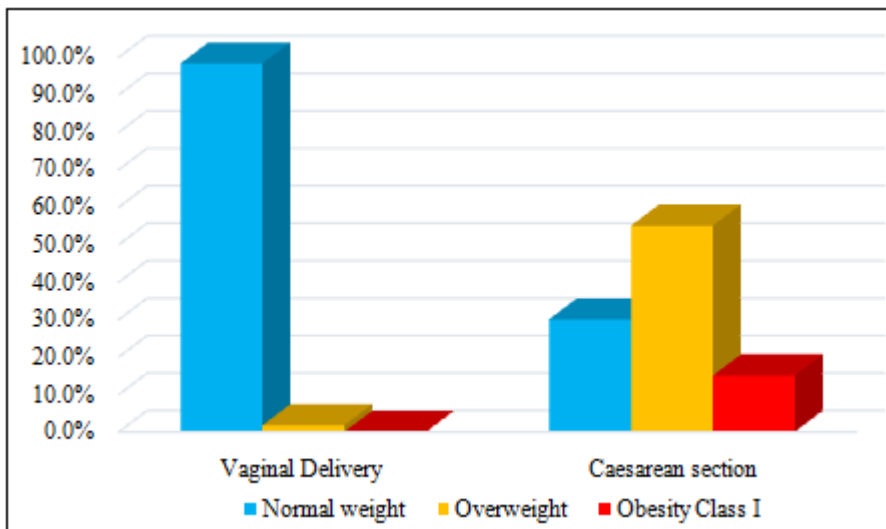


Figure 2: Comparison of mother's BMI between different modes of delivery

Table 3: Comparison of baby's weight between different modes of delivery

Parameter		Mode of Delivery		Total	Chi square value	P value	
		Vaginal Delivery	Caesarean section				
Baby's weight	<2.5 kg	N	6	0	6	10.286	0.016
		%	10.3%	0.0%	7.7%		
	2.5-3 kg	N	47	13	60		
		%	81.0%	65.0%	76.9%		
	3-3.5 kg	N	5	6	11		
		%	8.6%	30.0%	14.1%		
	>3.5 kg	N	0	1	1		
		%	0.0%	5.0%	1.3%		
Total		N	58	20	78		
		%	100.0%	100.0%	100.0%		

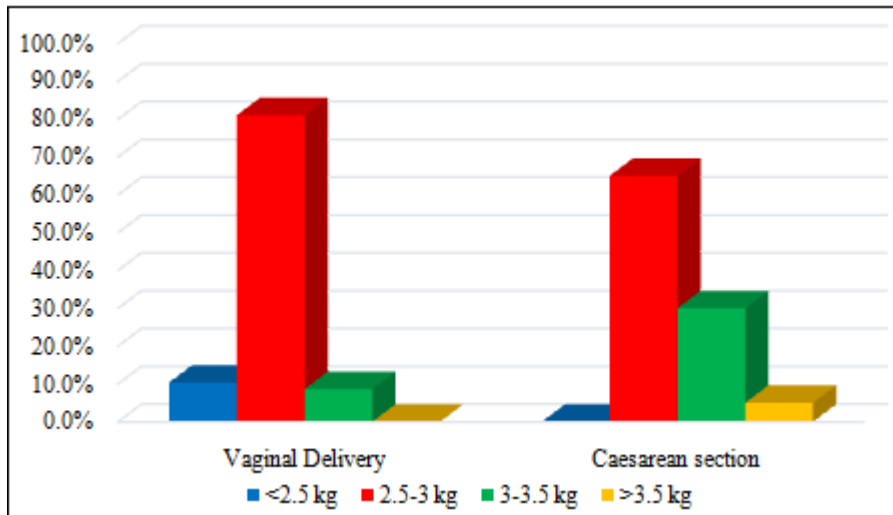


Figure 3: Comparison of baby's weight between different modes of delivery

Table 4: Comparison of prior vaginal delivery between different modes of delivery

Parameter			Mode of Delivery		Total	Chi square value	P value
			Vaginal Delivery	Caesarean section			
Prior vaginal delivery	Yes	N	17	0	17	7.496	0.006
		%	29.3%	0.0%	21.8%		
	No	N	41	20	61		
		%	70.7%	100.0%	78.2%		
Total		N	58	20	78		
		%	100.0%	100.0%	100.0%		

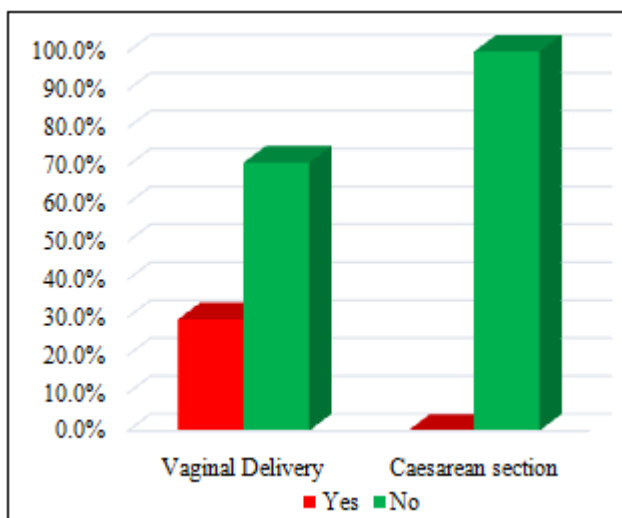


Figure 4: Comparison of prior vaginal delivery between different modes of delivery

Table 5: Distribution of various complications in different modes of delivery

Complications		Mode of Delivery	
		Vaginal Delivery	Caesarean section
Rupture Uterus	N	0	3
	%	0.0%	15.0%
Other maternal complication	N	1	0
	%	1.7%	0.0%
Baby admitted to NICU	N	1	11
	%	1.7%	55.0%
Postpartum haemorrhage	N	2	0
	%	3.4%	0.0%

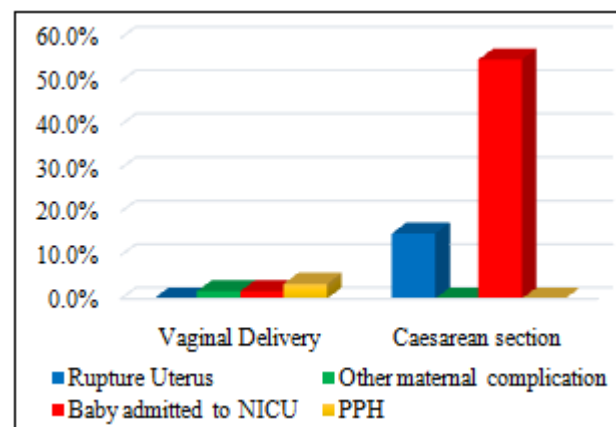


Figure 5: Distribution of various complications in different modes of delivery

Table 6: Distribution of condition of scar intraop in caesarean section

Condition of scar intraop	N	%
Intact	11	55.0%
Scar rupture	3	15.0%
Impending scar rupture	6	30.0%
Total	20	100.0%

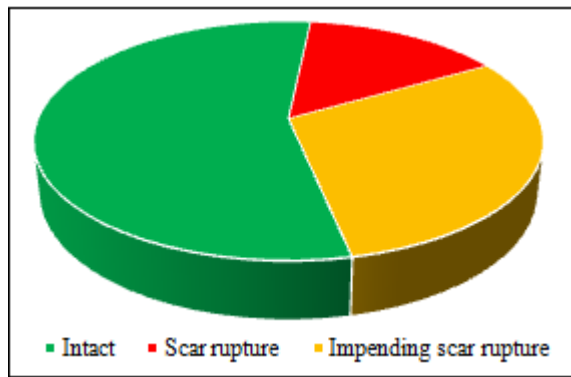


Figure 6: Distribution of condition of scar intraopin caesarean section

Table 7: Distribution of indications for caesarean section

Indications for caesarean section	N	%
Scar rupture	3	15.0%
Impending scar rupture	6	30.0%
Foetal Distress	3	15.0%
Meconium Stained Liquor	5	25.0%
Prolonged Labour	3	15.0%
Total	20	100.0%

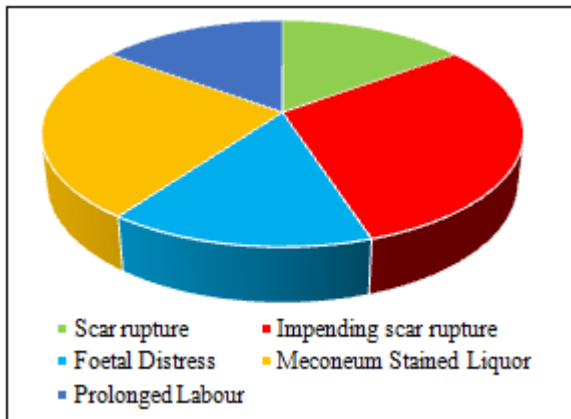


Figure 7: Distribution of indications for caesarean section

#### 4. Discussion

For a long period, caesarean sections were considered in the subsequent pregnancies, reflecting a concern that uterine scar might rupture during labour. [7] Later, as the prevalence of Caesarean Sections (CS) increased, vaginal birth after CS (VBAC) was regarded as a method of lowering the overall caesarean section rate. Many women find that VBAC is a secure alternative. [8, 9] In many nations, where the reproductive pattern is characterised by early pregnancy and high fertility throughout the reproductive years, this is true. In order to lessen the negative effects and dangers of repeated caesarean sections, particularly for ongoing fertility, many women prefer a vaginal birth after a caesarean operation. However, the percentage of women worldwide who choose vaginal delivery after a previous caesarean delivery has sharply fallen due to safety concerns. [10]

The aim of the present study was to evaluate the demographic and obstetrical factors for successful outcome in vaginal birth after caesarean section. Significant associations were found between vaginal birth and younger

maternal age (20-30 years), maternal BMI within normal range, weight of new-born (less than 3kg) and prior vaginal delivery. Arunanchal et al. (2017) reported that, when the age of the mother is over 35, there is significantly lesser chance of successful VBAC ( $P < 0.01$ ); women who had a vaginal delivery following CS were significantly more likely to have a successful VBAC compared to those who had one prior to CS ( $P < 0.01$ ) and the success rate of VBAC was significantly higher in women who had infants weighing  $\leq 3$  kg ( $P < 0.01$ ). [11] Bujold et al. (2004) reported from their 14 year study covering 2493 women that maternal age at the time of TOL equal or greater than 35 years old was associated with a lower rate of successful vaginal delivery. [12] Iyer et al. (2001) stated that there are more chances of VBAC (84.8%) in women with history of previous vaginal delivery compared to ones without (62.7%) ( $P < 0.01$ ). [13] Varun et al. (2023) reported that, BMI  $< 30$  kg/m<sup>2</sup> significant association with successful TOLAC and observed significant association of obesity with diabetes and hypertension may have a role in less successful VBAC among the mothers with high BMI [14]

The present study has found that, among the women who underwent caesarean section intraoperatively 55.0% had intact scar, 15.0% had scar rupture and 30.0% had impending scar rupture. Among these women majority of repeat Caesarean section were done for impending scar rupture (30%) while others had meconium stained liquor (25%), scar rupture (15%), foetal distress (15%) and prolonged labour (15%). Bangal et al. (2013) reported that, the indications of caesarean section in most of the women were foetal distress (46%), scar dehiscence (13%) and undiagnosed cephalopelvic disproportion (13%). [15] Neha et al. (2019) reported that, indications of caesarean section in the women were foetal distress (47.5%), scar tenderness and signs of impending rupture (35.0%), failed progress of labour (17.5%). [16] Bangal et al. (2017) stated that the common indications for the caesarean section during last pregnancy were scar tenderness (44.12%) and foetal distress (20.59%). [17]

There remains a persistent yearning for more children, particularly male offspring, among a section of people, despite the government's continued efforts to promote the norm of the modest family. Even after the second CS, a lot of women still reject bilateral tubal ligation procedures. They run the risk of experiencing issues from scar rupture during a subsequent pregnancy and labour because of this choice. Many caesarean procedures can be avoided if women are informed about the possibility of VBAC and the dangers of a subsequent C-section. To lower the risk of a subsequent caesarean section, VBAC should be promoted in certain circumstances. Due to the possibility of a scar rupture with a possibility of subsequent medico-legal litigations, many obstetricians avoid TOLAC. It needs to be made aware of the long-term effects of choosing repeat CSs vs VBAC deliveries. [13, 18]

#### 5. Conclusion

VBAC has clear advantages to a subsequent caesarean section because there is no operational morbidity or mortality, a significantly shorter hospital stay, and

significantly lower costs. The results of the current study show that a number of variables, including maternal age, maternal BMI, baby's weight, and previous vaginal deliveries, are significantly associated with the success of a vaginal birth. The capacity to identify women who are likely to experience a failed VBAC and those who have a high likelihood of a successful vaginal birth after Caesarean section will help obstetricians and women to make wise clinical decisions and reduce unfavourable outcomes.

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