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Frequency of Vaginal Birth after Caesarean Section in Patients with Previous one Cesarean Section

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ABSTRACT

Background: Vaginal delivery after cesarean section is a rapidly gaining significance obstetric choice, providing a reasonable alternative from repeat operation in properly selected patients. Increased global cesarean deliveries have brought forward the importance of assessing regional trends in successful vaginal delivery after cesarean section in low obstetric data registering area like Abbottabad. **Objective:** To determine the frequency of vaginal birth after caesarean section in patients with previous one cesarean section. **Study Design:** Cross-sectional descriptive study. **Duration and Place of Study:** The study was conducted from January 2025 to May 2025 at the Department of Obstetrics and Gynaecology, Ayub Teaching Hospital, Abbottabad. **Methodology:** A total of 139 women aged 20–40 years, each with one previous cesarean delivery and a singleton pregnancy beyond 36 weeks, were included. Exclusion criteria comprised maternal medical disorders and obstetric complications that could influence labor outcomes. All participants underwent a supervised trial of labor, with outcomes documented as successful or unsuccessful vaginal birth after cesarean section. **Results:** Successful vaginal birth after cesarean section occurred in 64.70% of patients. Gestational age ≤39 weeks ($p = 0.028$) and rural residence ($p = 0.049$) were significantly associated with successful vaginal delivery, whereas maternal age, education, and socioeconomic status were not statistically significant. **Conclusion:** Vaginal birth after cesarean section is a safe and feasible delivery option for women with one prior cesarean delivery when proper selection and institutional readiness are ensured.

INTRODUCTION

Vaginal delivery after cesarean (VBAC) can be defined as a spontaneous vaginal delivery in the woman with a history of one previous cesarean section.[1] In recent years, the clinical importance of VBAC has gained significance since the rate of cesarean deliveries is increasing worldwide, along with maternal and neonatal morbidities.[2] Trial of labor after cesarean (TOLAC) enables the patient for vaginal delivery after trying, thus decreasing the chance for repeat cesarean surgery.[3] The clinical information shows that the success rate for VBAC can range from 60% to 80% and specifically in the patient with the history of previous lower segment transverse uterine incision.[4] The success of VBAC relies on the variables such as the reason for the previous cesarean, type of uterine scar, the interval after the delivery (inter-delivery interval), age of the mother, and fetal birth weight.[5] To provide maternal-fetal safety, correct selection of the case, intrapartum fetal monitoring in continuous fashion, and the backup with emergency obstetric surgical assistance are required.[6]

A successful VBAC yields several maternal and fetal advantages. It decreases postoperative complications such as puerperal infection, postpartum haemorrhage, anesthetic complications, and hospital stay longer than the usual stay.[7] It also improves the maternal recovery and patient satisfaction in general. In multiparous women, VBAC lowers the future pregnancy risk of placental pathologies like placenta previa and placenta accreta spectrum conditions.[8] It does carry the risks of potential hazards like uterine rupture, though rare, which may lead to severe maternal and perinatal morbidity.[9] Therefore, decision regarding VBAC should be in the aftermath of exhaustive antenatal counseling, in preference for preference for informed consent and individualized risk estimate.

For optimal outcomes, VBAC requires institutional readiness, skilled obstetric supervision, and available operative backup.[10] The ideal candidates for VBAC are women with one prior lower transverse cesarean incision and a non-recurrence cause for the previous operation.[11] Contradictions are a classical or vertical uterine incision, previous uterine rupture, or cephalopelvic disproportion.[12] In summary, with the correct administration in an adequately equipped and staffed obstetric suite supervised by skilled medical practitioners, VBAC remains a safe and efficient obstetric alternative

among women with one previous cesarean section and the need for a vaginal mode of delivery. In a study by Abou El-Ardat M, et al. has shown that the frequency of vaginal birth after caesarean section was 64% in patients with previous one cesarean section.[13]

The requirement for the current study in Abbottabad comes from the elevated rates of cesarean sections documented in the area and the scarcity of local information on the safety and success of vaginal birth after cesarean. Abbottabad, with its status as a referral point for the urban and rural communities, is a referral center with a varied obstetric profile in which awareness, practices of counseling, and institutional capabilities are highly variable. Estimating the feasibility, rate of success, and complications in VBAC in such a population shall facilitate the formulation of local guidelines in a more evidence-based format, optimized maternal outcomes, and curtailed unnecessary repeat cesarean delivery. The current work shall also facilitate patient education and optimized resource utilization in the healthcare facility in the region.

METHODOLOGY

This cross-sectional descriptive study was carried out in the Department of Obstetrics and Gynaecology, Ayub Teaching Hospital, Abbottabad, from January 2025 to May 2025. Prior approval for the study protocol was obtained from the institutional ethics review board before the commencement of data collection. Participants were recruited through a non-probability consecutive sampling approach. The sample size of 139 participants was computed using the World Health Organization sample size estimation formula, considering an anticipated vaginal delivery frequency of 64% among women with one previous caesarean birth,[13] a confidence level of 95%, and an allowable error margin of 8%.

Women aged between 20 and 40 years, having a singleton pregnancy confirmed by ultrasound, gestational age of more than 36 weeks according to the last menstrual period, and parity of one with a single prior caesarean delivery were invited to participate. Patients with medical disorders or obstetric conditions that potentially may influence the outcome of labour, for example, diabetes mellitus, hypertension, placenta previa, asthma, fetal macrosomia, or cephalopelvic disproportion detected by ultrasonography, were excluded in order to reduce the effect of confounders. Prior to enrollment, all eligible candidates were thoroughly explained the nature, purpose, and possible effects of the study. Written informed consent was sought after ensuring complete understanding and voluntary consent. A history of obstetric antecedents was documented for each candidate, followed by careful clinical evaluation in order to determine the maternal and fetal well-being. Trial supervised labour monitoring was undergone by all the women in the presence of the consultant obstetrician with at least three post-fellowship experience. Induction/augmentation of labour, if required, was induced with the administration of 5 IU oxytocin in 500 ml glucose solution, which was run at varied rates in accordance with the uterine reactivity. Intermittent doses of thiopental sodium (2.5 g in glucose solution in 500 ml in glucose solution) were used for sedation and maternal sedation and were delivered whenever necessary in order to produce light sedative effect. In the event maternal/fetal distress occurred or if the labour wasn't sufficiently progressive, the patient underwent emergency delivery in the form of caesarean section in the opinion of consultant. Post-delivery, the patients were kept in the labour ward for 24 hours observation; stable were then from the labour ward shifted from the postnatal ward for routine follow-ups.

Vaginal birth after caesarean section was defined as the spontaneous onset of labour in the vaginal delivery of a fetus presenting in vertex position in a woman with one previous caesarean birth. The occurrence of such a delivery was documented. Data were analyzed using IBM SPSS Statistics version 26. Continuous variables were presented as mean ± standard deviation, whereas categorical data were expressed in frequencies and percentages. Stratification was performed for potential confounding factors. Associations between categorical variables were tested using the chi-square test, and a p-value of ≤0.05 was considered statistically significant.

RESULTS

A total of 139 patients with a mean age of 30.14±4.17 years and mean gestational age of 39.19±1.01 weeks were included in the study. In terms of residential status, 78 (56.1%) patients were from rural backgrounds and 61 (43.9%) were from the city. Education distributive revealed that 34 (24.5%) patients were illiterate, 26 (18.7%) were at the primary school level, 42 (30.2%) were at the secondary school level, 16 (11.5%) were graduates, and 21 (15.1%) were at the high school and above level. Socioeconomic status analysis indicated that 57 (41.0%) patients were from the poor class, 62 (44.6%) were from the middle class, and 20 (as shown in Table-I).

Table I

Patient Demographics

Demographics	Mean ± SD / n (%)
Age (years)	30.14±4.17
Gestational Age (weeks)	39.19±1.01
Residential Status	
Rural n (%)	78 (56.1%)
Urban n (%)	61 (43.9%)
Education Level	
Illiterate n (%)	34 (24.5%)
Primary n (%)	26 (18.7%)
Secondary n (%)	42 (30.2%)
Graduate n (%)	16 (11.5%)
Higher n (%)	21 (15.1%)
Socioeconomic Status	
Poor n (%)	57 (41.0%)
Middle n (%)	62 (44.6%)
Rich n (%)	20 (14.4%)

Successful vaginal birth after cesarean section was observed in 90 patients (64.70%), while 49 patients (35.30%) did not achieve it out of the total 139 patients (as shown in Table-II).

Table II

Frequency of Vaginal Birth After Caesarean Section in Patients with Previous One Cesarean Section

Vaginal Birth After Caesarean (VBAC)	Frequency	%age
Yes	90	64.70%
No	49	35.30%
Total	139	100%

When the correlation of VBAC with demographic variables was studied, age-wise stratification revealed that among patients ≤30 years, successful VBAC was observed in 52 (69.3%) compared with 23 (30.7%) who were unsuccessful, while in >30 year's patients, successful VBAC was observed in 38 (59.4%) and unsuccessful in 26 (40.6%), with a p-value of 0.221 and no statistically significant correlation. Significant correlation was observed with gestational age, with gestational age ≤39 weeks having successful VBAC in a high number with 43 (75.4%) successful vaginal delivery and 14 (24.6%) unsuccessful, while gestational age >39 weeks registered successful VBAC in 47 (57.3%) and unsuccessful in 35 (42.7%) and a statistically significant p-value was observed in the result in the value 0.028. Significant correlation was also observed with residential status with rural area patients registering successful VBAC with 56 (71.8%) and unsuccessful in 22 (28.2), while urban area patients registered successful in 34 (55.7%) and unsuccessful in 27 (44.3), with statistically significant p-value in the result in the value 0.049. Fischer Exact Test used in analyzing the educational level revealed no significant correlation with the result in the value 0.730, where illiterate patients registered successful VBAC in 23 (67.6%) and unsuccessful in 11 (32.4), primary educated in successful in 19 (73.1), and unsuccessful in 7 (26.9), secondary educated in successful in 25 (59.5), and unsuccessful in 17 (40.5), graduates in successful in 11 (68.8), and unsuccessful in 5 (31.3), and high in successful in 12 (57.1), and unsuccessful in 9 (42.9). Socioeconomic status analysis revealed no significant correlation with the result in the value 0.336, with poor in successful in 41 (71.9), and unsuccessful in 16 (28.1), with middle-class in successful in 37 (59.7), and unsuccessful in 25 (40.3), and rich in successful in 12 (60.0), and unsuccessful in 8 (40.0) (as shown in Table-III).

Table III

Association of Vaginal Birth After Caesarean Section with Demographic Factors

Demographic Factors		Vaginal Birth After Caesarean Section		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	52 (69.3%)	23 (30.7%)	0.221
	>30	38 (59.4%)	26 (40.6%)	
Gestational Age (weeks)	≤39	43 (75.4%)	14 (24.6%)	0.028
	>39	47 (57.3%)	35 (42.7%)	
Residential Status	Rural	56 (71.8%)	22 (28.2%)	0.049
	Urban	34 (55.7%)	27 (44.3%)	
Education Level	Illiterate	23 (67.6%)	11 (32.4%)	0.730*
	Primary	19 (73.1%)	7 (26.9%)	
	Secondary	25 (59.5%)	17 (40.5%)	
	Graduate	11 (68.8%)	5 (31.3%)	
	Higher	12 (57.1%)	9 (42.9%)	
Socioeconomic Status	Poor	41 (71.9%)	16 (28.1%)	0.336
	Middle	37 (59.7%)	25 (40.3%)	
	Rich	12 (60.0%)	8 (40.0%)	

*Fischer Exact Test

DISCUSSION

The current study revealed a successful VBAC rate of 64.70%, showing that almost two-thirds of women with a history of cesarean section attained vaginal delivery, which suggests that VBAC can be an acceptable alternative with correct patient selection. The strong correlation between gestational age and the success of VBAC, with increased rates at ≤39 weeks, can be due to the increased fetal size and possible cephalopelvic disproportion that occurs after 39 weeks and cause vaginal delivery more difficult. The increased VBAC success in rural compared with urban women can be due to more physical exercise and labor in the whole gestational state in the rural area, which can cause more wholesome pelvic muscular tone and improved labor mechanisms. Lack of significant correlation between maternal age and the success of VBAC implies that chronological age does not play a significant role in affecting the contractility of the uterus and the structure of the pelvis in the reproductive age range observed. In the same context, the level of the patient's education and his socioeconomic status found no significant correlation with the outcomes of VBAC, which implies that these variables are direct determinants of the physiological process of labor and delivery.

The present study demonstrated a VBAC success rate of 64.70%, which is comparable to several local studies including Naheed F, et al. [14] who reported 64.9% success rate, Khan MA, et al.[15] with 64.52%, and Gul K, et al. [16] with 60.4%, indicating consistency in VBAC outcomes across different tertiary care centers in Pakistan when appropriate patient selection criteria are applied. However, our findings differ from higher success rates reported by Khanum S, et al. [17] at 70.7%, Sadaf R, et al. [18] at 72%, Janjua M, et al. [19] at 72.78%, Rahman M, et al. [20] at 79.4%, and Ali R, et al. [21] at 86.75%, which may be attributed to variations in patient selection criteria, institutional protocols, and the inclusion of women with more favorable obstetric characteristics such as previous vaginal delivery history or optimal lower uterine segment scar thickness. Conversely, our success rate was substantially higher than the 48.4% reported by Bari A, et al. [22] and 28.67% by Bano I, et al. [23] possibly reflecting differences in the threshold for emergency cesarean intervention, patient counseling approaches, or institutional experience with managing trial of labor. The significant association between gestational age ≤39 weeks and VBAC success in our study aligns with Khan MA, et al. [15] who found gestational age 40-41 weeks significantly associated with VBAC outcomes, supporting the notion that advancing gestational age beyond 39 weeks increases fetal size and the likelihood of cephalopelvic disproportion, thereby reducing the probability of successful vaginal delivery. Our finding of higher VBAC success in rural women compared to urban women contrasts with most published literature that does not stratify outcomes by residential status, suggesting this

may be a unique demographic factor in our population related to physical activity patterns and body composition differences. The lack of significant association between maternal age and VBAC success in our study is supported by Rahman M, et al. [20] and Bano I, et al. [23] who found age to be a non-significant predictor, although Khan MA, et al. [15] and Janjua M, et al. [19] reported age <30-40 years as a favorable factor, which may reflect the complex interplay between chronological age and other obstetric variables such as parity and inter-pregnancy interval. Similarly, our finding of no significant association with socioeconomic status and education level is consistent with the observation that biological and obstetric factors rather than sociodemographic variables primarily determine VBAC success, as these factors do not directly influence uterine contractility, cervical ripening, or pelvic biomechanics essential for successful labor progression.

The current study also has some limitations that should be borne in mind. Firstly, since it is a single-center study carried out in a single tertiary care hospital, the result may not generalize in healthcare settings with varying patient populations, resource access, and clinical practice. Secondly, the cross-sectional design does not allow for the establishment of causative associations between the demographic variables and VBAC outcomes since it only yields a snapshot view at a single point in the future. Thirdly, the study failed to consider key obstetric variables like inter-delivery interval, history of previous vaginal delivery, Bishop score at admission, thickness of lower uterine segment scar, and indication in the previous cesarean section which all have been reported from other studies in big ways affecting the success in VBAC. Moreover, the sample size which was used in the current study was relatively small and thus may have constrained the statistical power in determining the significant association, especially in variables with multiple subgroups like the society economic status and the level of education.

CONCLUSION

Our research concluded that vaginal delivery after cesarean section continues to be an acceptable and successful alternative in women with one prior cesarean delivery, with the great majority of properly chosen patients attaining successful vaginal delivery. The results show that gestational age and living status are independent predictors of VBAC outcome.

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