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Fetomaternal Outcome of Vaginal Birth after Previous 1 Cesarean Section Presenting at Ayub Teaching Hospital

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ABSTRACT

Background: Vaginal birth after previous one caesarean section is an important option for delivery and it help to reduce repeated surgery but still some risks present for mothers and baby. Local data about fetomaternal outcomes is limited in this area. **Objective:** To determine fetomaternal outcome in women undergoing vaginal birth after previous one caesarean section. **Study Design:** Descriptive study. **Duration and Place of Study:** This study was done from 15 January 2025 to 15 May 2025 in Department of Obstetrics and Gynaecology Ayub Teaching Hospital Abbottabad. **Methodology:** Total 164 patients with age 18–40 years included. Trial of labour was allowed under supervision. Data was analysed by using SPSS version 20. Mean and standard deviation was calculated for numerical variables and frequency with percentage for categorical variables. **Results:** Mean age was 29.38±5.99 years. Majority patients were rural 86(52.4%) and middle socioeconomic group 84(51.2%). Regular antenatal care was present in 84(51.2%) patients. Neonatal intensive care admission was seen in 26(15.9%) patients while 138(84.1%) not required admission. Postpartum haemorrhage was observed in 9(5.5%) patients. Significant association was found between age and postpartum haemorrhage where age >30 years had higher frequency 7(10.4%) as compared to ≤30 years 2(2.1%) (p=0.033). **Conclusion:** Vaginal birth after previous one caesarean section is safe option in selected patients but some risk of neonatal admission and postpartum haemorrhage still present

INTRODUCTION

The vaginal birth after cesarean delivery (VBAC) is an important mode of delivery in women who have previously had a cesarean delivery referred to as the vaginal birth after cesarean.[1] This method is recommended when the risks of the procedure are minimal and the previous scar is of the lower segment transverse variety.[2] The recommendation for this mode of delivery is mainly due to its advantage over repeated surgeries because of the risks involved, like the formation of adhesions.[3] Patient selection is very important in order for the procedure to be done safely.

Most of the fetomaternal complications resulting from a vaginal birth after cesarean (VBAC) are related to admission in the neonatal intensive care unit (NICU), an important determinant of neonatal health.[4] Sometimes, babies born after attempted labor may suffer from distress due to prolonged labor or scar issues in the uterus. This could result in admission in the NICU for monitoring and treatment. NICU admission is not consistent among babies but is usually slightly more common after unsuccessful than successful VBACs.[5] Some of the reasons are fetal distress, meconium stained amniotic fluid, and low Apgar scores. On the other hand, several research findings reveal that when VBAC is a success, neonatal outcomes are on par with those of vaginal births.[6]

Postpartum hemorrhage is one of the important maternal outcomes related to vaginal delivery after cesarean delivery and is a prominent cause of maternal illness.[7] Trial of labor in women after cesarean can result in an increased risk of postpartum hemorrhage, especially if the duration of labor is long and requires operation during delivery.[8] Uterine atony, uterine scar rupture, and retained placenta are among other factors leading to increased bleeding in this case.[9] However, with regard to successful vaginal deliveries after cesarean, the chance of having postpartum hemorrhage is relatively low.[10]

The research is justified in Abbottabad because there is an increasing incidence of cesarean births in addition to more cases of women who have previously undergone a cesarean birth, although there is still insufficient information available locally regarding the risks and benefits of vaginal birth after cesarean (VBAC). It is likely that differences in prenatal care, nutrition, and the presence of facilities providing emergency obstetrics will

affect fetal-maternal outcome; therefore, there is a need for a study in this particular population.

METHODOLOGY

This descriptive study was carried out in the Department of Obstetrics and Gynaecology at Ayub Teaching Hospital from 15 January 2025 to 15 May 2025. Approval was taken from hospital ethical committee and ethical approval certificate number was RC-EA-2024/203. Sample size was 164 which was calculated by using WHO sample size calculator by taking expected frequency of postpartum haemorrhage as 4%,[11] confidence level 95% and absolute precision 3%.

Inclusion criteria: Patients of age 18–40 years and having history of previous caesarean section were included.

Exclusion criteria: Patients having period of gestation >41 weeks, history of postoperative wound infection and placenta previa were excluded from study.

Written informed consent was taken from each patient before data collection after explaining purpose, risks and benefits of study. Demographic data was recorded including age, residence, education and socioeconomic status. Other baseline variables like weight, height and BMI were also recorded. Detailed history was taken regarding obstetric profile including parity and antenatal care pattern. Complete physical examination was done for all patients. All enrolled pregnant patients with previous one caesarean section was followed and advised to present in labour room when spontaneous labour starts between 37 to 40+6 weeks of gestation. Trial of vaginal birth was allowed under supervision and patients were monitored throughout labour by consultant having ≥5 years post-fellowship experience. Findings were recorded on predesigned proforma.

After completion of deliverys and follow-up, fetomaternal outcome was assessed. Caesarean section was considered as surgical delivery by making incision on abdominal wall and uterus, while vaginal birth was taken as delivery through birth canal without any surgical intervention. Neonatal intensive care units admission was taken when baby required ICU admission due to critical condition at birth. Post-partum haemorrhage was taken as blood loss >500 mL which was measured by weighing soaked sanitary pad and converting 1 g equal to 1 mL blood losses.

Data was entered and analysed using SPSS version 20. Categorical variables like socioeconomic status, antenatal care and fetomaternal outcomes were presented as frequencies and percentages. Numerical variables like age, parity, weight, height and BMI were presented as mean ± SD. Stratification of fetomaternal outcome was done with respect to age, BMI, parity and antenatal care to see effect modifiers. Post-stratification chi-square test or Fisher exact test was applied and p-value <0.05 was considered statistically significant.

RESULTS

A total of 164 patients were included. The mean age of the participants was 29.38 ± 5.99 years, with a mean height of 1.59 ± 0.05 m and mean weight of 69.89 ± 9.48 kg. The mean BMI was recorded as 27.28 ± 3.21 kg/m^2 and mean parity was 2.51 ± 1.22. With regards to place of residence, majority of patients was from rural areas, accounting for 86 (52.4%) of the total, whilst urban residents comprised 78 (47.6%). In terms of socioeconomic status, most patients belonged to the middle class, 84 (51.2%), followed by low socioeconomic group, 59 (36.0%), and high socioeconomic group, 21 (12.8%). Antenatal care (ANC) attendance was nearly equally distributed, with 84 (51.2%) patients attending regular ANC and 80 (48.8%) attending irregularly (Table-I).

Table I

Patient Demographics

Demographics	Mean ± SD
Age (years)	29.38 ± 5.99
Height (m)	1.59 ± 0.05
Weight (kg)	69.89 ± 9.48
BMI	27.28 ± 3.21
Parity	2.51 ± 1.22
Resident	
Rural n (%)	86 (52.4%)
Urban n (%)	78 (47.6%)
Socioeconomic Status	
Low n (%)	59 (36.0%)
Middle n (%)	84 (51.2%)
High n (%)	21 (12.8%)
ANC	
Regular n (%)	84 (51.2%)
Irregular n (%)	80 (48.8%)

Regarding neonatal outcomes, NICU admission was recorded in 26 patients, representing 15.9% of the total cohort, whilst the remaining 138 (84.1%) did not required NICU admission. Postpartum haemorrhage (PPH) was observed in 9 (5.5%) of the patients, with the majority, 155 (94.5%), being free of this complication (Table-II).

Table II

Frequency of NICU Admission and Postpartum Hemorrhage Among Patients (n=164)

Variable	Frequency	% age
NICU		
Yes	26	15.90%
No	138	84.10%
Total	164	100%
PPH		
Yes	9	5.50%
No	155	94.50%
Total	164	100%

When the association between demographic factors and NICU admission was examined, no statistically significant associations was found. Age had no significant bearing on NICU admission, as 15 (15.5%) of patients aged ≤30 years and 11 (16.4%) of those aged >30 years required NICU care (p = 0.869). BMI also did not demonstrate a significant association, with NICU admission noted in 10 (20.4%) patients with BMI ≤25 and 16 (13.9%) with BMI >25 (p = 0.297). Similarly, parity showed no significant difference, with 15 (16.9%) in the ≤2 parity group and 11 (14.7%) in the >2 parity group requiring NICU admission (p = 0.702). ANC regularity likewise did not reach statistical significance, with NICU admission occurring in 11 (13.1%) regular attenders and 15 (18.8%) irregular attenders (p = 0.322) (Table-III).

Table III

Association of Demographic Factors with NICU Admission

Demographic Factors	Subgroup	NICU		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	15 (15.5%)	82 (84.5%)	0.869
	>30	11 (16.4%)	56 (83.6%)	
BMI (Kg/m^2)	≤25	10 (20.4%)	39 (79.6%)	0.297
	>25	16 (13.9%)	99 (86.1%)	
Parity	≤2	15 (16.9%)	74 (83.1%)	0.702
	>2	11 (14.7%)	64 (85.3%)	
ANC	Regular	11 (13.1%)	73 (86.9%)	0.322
	Irregular	15 (18.8%)	65 (81.3%)	

The association of demographic factors with PPH revealed that age was a statistically significant predictor. Patients aged >30 years had a notably higher rate of PPH at 7 (10.4%) compared to only 2 (2.1%) in those aged ≤30 years, and this difference was statistically significant (p = 0.033). BMI was not significantly associated with PPH, as it occurred in 1 (2.0%) patient with BMI ≤25 and in 8 (7.0%) with BMI >25 (p = 0.282). Parity also did not reached statistical significance, with PPH observed in 2 (2.2%) patients with parity ≤2 and 7 (9.3%) with parity >2 (p = 0.081). ANC attendance showed no significant association, with PPH occurring in 5 (6.0%) regular attenders and 4 (5.0%) irregular attenders (p = 1.000) (Table-IV).

Table IV

Association of Demographic Factors with PPH

Demographic Factors	Subgroup	PPH		p-value
		Yes n(%)	No n(%)	
Age (years)	≤30	2 (2.1%)	95 (97.9%)	0.033*
	>30	7 (10.4%)	60 (89.6%)	
BMI (Kg/m^2)	≤25	1 (2.0%)	48 (98.0%)	0.282
	>25	8 (7.0%)	107 (93.0%)	
Parity	≤2	2 (2.2%)	87 (97.8%)	0.081
	>2	7 (9.3%)	68 (90.7%)	
ANC	Regular	5 (6.0%)	79 (94.0%)	1.000
	Irregular	4 (5.0%)	76 (95.0%)	

*Fischer Exact Test

DISCUSSION

In present study, NICU admission was recorded in 26 (15.9%) neonates. This rate is not unexpectedly, as neonates born through VBAC may sometimes experience intrapartum hypoxia or suboptimal uterine contractions during labour, which can compromise foetal oxygenation and necessitate neonatal intensive care. The myometrial integrity at the scar site may also had contributed to transient foetal distress during active labour phase. PPH was observed in 9 (5.5%) patients, which although relatively low, remain a clinically important complication. The previous uterine scar causes structural alteration in the myometrium, which may impair its contractility following delivery, thereby predisposing to uterine atony and subsequent haemorrhage. Age was found to have a statistical significant relation with post-partum haemorrhage (PPH) (p=0.033). The older age group (>30 years old) were found to have a greater percentage of PPH (7 cases; 10.4%) as compared to their younger counterparts (2 cases; 2.1%). Biomedical theories suggest that increased maternal age results in poor uterine elasticity and contractility, hence raising the chance for atonic post-partum haemorrhage. In addition, other conditions such as co-morbid diseases, as well as abnormal placenta attachment, would increase the chances of post-partum haemorrhage, especially when there is a previous cesarean scar.

The NICU admission rate in the present study was 26 (15.9%), which is closely comparable to the findings of Jain *et al.* [12] who reported NICU admission in 19.15% of cases, and Bano *et al.* [13] who observed a rate of 9.30%, suggesting that neonatal morbidity following VBAC remain a consistent concern across different clinical settings. The slightly higher rate in the present study may be attributable to the relatively high proportion of irregular ANC attenders 80 (48.8%), as inadequate antenatal surveillance may has led to delayed identification of foetal compromise during labour. In contrast, Khan *et al.* [14] reported zero NICU admissions in their VBAC group, which may reflect better patient selection criteria and more stringent eligibility assessment for trial of labour in their cohort.

PPH was observed in 9 (5.5%) patients in the present study, which is comparatively lower than the 33.3% reported by Adewale *et al.* [15] in the caesarean group of their cohort, and also lower than the 2.32% noted by Bano *et al.* [13] suggesting a moderate rate of haemorrhagic complication. The relatively low PPH rate in the present study may be explained by the fact that vaginal delivery itself carries lesser risk of surgical haemorrhage compared to repeat caesarean, and the uterine atony, when it occurred, was perhaps managed promptly in majority of the cases.

Advancing maternal age was found to be significantly associated with PPH in the present study (p = 0.033), with women aged more than 30 years experiencing PPH more frequently 7 (10.4%) as compared to younger women 2 (2.1%). This is consistent with the observation by Maurya *et al.* [16] who demonstrated that VBAC success was significantly lower in women aged more than 35 years (p = 0.001), and that older age was associated with poorer obstetric outcomes overall. The biological explanation for this association lies in the fact that advancing maternal age is accompanied by diminished myometrial contractility, reduced tissue elasticity at the scar site, and a greater likelihood of comorbid conditions, all of which may collectively increase the susceptibility to uterine atony and postpartum bleeding.

The majority of patients in the present study belonged to rural background 86 (52.4%) and middle socioeconomic class 84 (51.2%), which is in agreement with Qazi *et al.* [17] who also found that rural residence was significantly associated with VBAC outcomes (p = 0.049).

This pattern possibly reflect the limited access to elective repeat caesarean services in rural and resource-constrained settings, which may has inadvertently pushed more women towards trial of labour regardless of optimal candidacy.

The present study was conducted at a single centre which may limits the generalisability of the findings to broader population setting. The sample size of 164 patients was relatively small, which may has reduced the statistical power to detect significant associations, particularly for less frequent outcomes such as PPH. A cross-sectional design was utilised which does not allows establishment of causal relationships between the demographic factors and the observed fetomaternal outcomes. Data regarding some important variable such as interpregnancy interval, cervical dilatation at admission, indication of previous caesarean and foetal weight was not included which may has introduced confounding bias into the result.

CONCLUSION

The present study has concluded that vaginal birth after one previous caesarean section is a feasible and relatively safe options for carefully selected patients as majority of woman delivered successfully without major fetomaternal complication. NICU admission and postpartum haemorrhage was observed in a notable proportions of cases indicating that neonatal and maternal morbidity remain important concern in this group.

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