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■ Original Research Article

Vaginal Birth After Caesarean Section: Experience from a Secondary Healthcare Facility in Abuja, Northcentral Nigeria.

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ABSTRACT

Background: There has been a disproportionate increase in caesarean section (CS) rate worldwide. Repeat elective CS for one previous CS contributes significantly to the high CS rate. Delivery options for a woman with one previous CS are trial of vaginal birth after caesarean section (VBAC) and elective repeat CS. VBAC is an important strategy to reduce the high rate of CS. When successful, VBAC obviates the need for a repeat CS on account of a previous CS and reduces the complications associated with it. Aim: The aim of the study was to evaluate the practice and success rate of VBAC and its outcome in a secondary level healthcare facility. Materials and Method: This was a retrospective analysis of women who attempted VBAC in a secondary level healthcare facility in Abuja, over a 5-year period between January 1st 2018 to December 31st 2022. Results: The success rate of VBAC in this study was 36.4%. Failed VBAC rate resulting in emergency CS was 63.6% accounting for 3.3% of all CS within the study period. Multiparity, gestational age at delivery less than 40 weeks, and a history of a previous successful VBAC were significant factors for a successful VBAC. Overall, perinatal and maternal outcomes were good. **Conclusion:** VBAC success rate is low in our facility. Appropriate case selection and proper patient counselling are recommended to improve outcomes.

Keywords: Vaginal Birth after Caesarean Section, Repeat Elective Caesarean Section, Foetal Outcome, Maternal Complications

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INTRODUCTION

There is a disproportionately high caesarean section (CS) rate worldwide with current rates varying between 30 and 50%.[1] Elective repeat caesarean section on account of one previous caesarean section contributes significantly to the high CS rate worldwide.[2,3] Delivery options for a woman with one previous CS are trial of vaginal birth after caesarean section (VBAC) and elective repeat CS. Both options are associated with significant maternal and perinatal benefits and risks.[4-6] The decision on delivery option is most often dependent on the woman's preference, the availability of facilities for emergency interventions, and the provider's experience.[4,6]

Vaginal birth after caesarean section (VBAC), when successful, obviates the need for CS for one previous CS and reduces the complications associated with repeat CS. Consequently, VBAC is now widely being recommended as a strategy for stemming the rising

CS rate worldwide.[4,7,8] VBAC is particularly important in settings where there is aversion for CS, and a strong desire for a large family size.[7]

VBAC, also often referred to as trial of labour after caesarean section (TOLAC), is the planned attempt to have a vaginal birth after a previous CS. If TOLAC results in a vaginal birth it is regarded as a successful VBAC. Failed VBAC is failure to achieve a vaginal birth following TOLAC resulting in emergency repeat CS. Despite recommendations on the conduct and safety of VBAC, the practice has been on the downward trend in high income countries including the USA due to fear of litigation for adverse maternal and perinatal outcomes following failed VBAC.[4,8] The practice of VBAC in low-income countries varies from region to region and institution to institution due to the fear of uterine rupture, the aversion for CS by women and health systems challenges.[7,9] Seffah et al reported a decreasing trend towards VBAC and a rising CS rate in Ghana in the West African region.[9] The reported success rate of VBAC in developed countries is about 60-80%.[10,11] In developing countries, success rates vary between regions and institutions ranging from 30 to 80%.[9,12-22]

Risks associated with VBAC include increased risk to the mother of emergency CS (failed VBAC), postpartum haemorrhage, blood transfusion, uterine rupture, endometritis, and to the infant an increased risk of birth asphyxia and perinatal death.[3-5,23-25] Factors considered predictive of a successful VBAC include women with clinically adequate pelvis, with singleton pregnancy of cephalic presentation at term, who have had one previous uncomplicated lower segment CS for a non-recurrent indication and presenting in spontaneous labour.[4,5,13,15,16] Foetal macrosomia, short interpregnancy interval, induced or augmented labours, and previous CS for a recurrent indication are reported to be associated with less likelihood of a successful VBAC.[13,16,22,24] There is, however, no generally agreed reliable means of predicting the success of VBAC with different studies reporting different findings.

This study became imperative because studies on the practice of VBAC in Abuja, including our facility, are limited. In addition, findings from the study will guide recommendations for improving its uptake and outcomes.

MATERIALS AND METHOD

This was a 5-year retrospective review of the practice and outcome of vaginal birth after one previous caesarean section at the maternity unit of Maitama District Hospital (MDH) Abuja between January 1st 2018 and December 31st 2022. MDH is one of the public secondary level healthcare facilities in Abuja and is located in the Abuja Municipal Area Council (AMAC) of the territory. It provides specialized obstetric care and serves as a referral centre for patients from both public and private health institutions in the Federal Capital Territory (FCT) Abuja and its environs. The Hospital runs a secured electronic medical records system (E-Medical Records System) which guarantees and facilitates data confidentiality and retrieval when required.

For the study, data were collected from the patients' records on the E-Medical Records database and also from the labour ward, postnatal ward and theatre records when necessary.

The relevant socio-demographic and obstetric characteristics of the patients obtained included: age, booking status, educational level, occupation, parity, gestational age at delivery, indication for the previous CS, eventual mode of delivery and delivery outcome. The data extracted were entered into a computer and analysed using Statistical Package for Social Sciences (SPSS) version 26.0 (SPSS 26.0, IBM, Chicago) with results presented in tables and simple percentages. Frequency distribution was generated for all categorical variables for the descriptive aspect of the analysis. Means and standard deviations were determined for quantitative variables. Chi square test was applied for the comparison of proportions and evaluating association of categorical variables where applicable. A confidence interval of 95% and a p-value of < 0.05 was adopted as the level of statistical significance. Ethical approval was obtained from the Institution's Ethics Committee.

The main outcome measures were the proportion of successful and failed VBAC, while the secondary outcome measures were maternal and foetal outcomes and complications. In our facility, cases of one previous CS are not usually considered for induction or augmentation of labour as a protocol.

RESULTS

There was a total of 8,046 deliveries during the period of study. Out of these, 4,534 (56.4%) were vaginal deliveries while 3,512 (43.6%) were caesarean sections (CS), with emergency CS accounting for 1,873 (23.3%) of the cases. Also, during this period, 184 women had trial of vaginal birth after one previous caesarean section (VBAC) out of which 67 (36.4%) had successful vaginal delivery (successful VBAC) while 117 (63.6%) had emergency repeat CS (failed VBAC). Caesarean section due to failed VBAC accounted for 3.3% of all caesarean sections and 6.2% of emergency CS during the period of study.

The sociodemographic characteristics of patients who underwent VBAC are as shown in table 1. The majority of the women were within the 31-40 age

group with a mean age of 31.70±4.283 years. Most of the women were booked (90.2%), attained tertiary level of education (60.4%), and were civil servants (46.7%).

Table 1: Sociodemographic Characteristics of Patients Who Underwent VBAC

Characteristics	**Frequency**	**Percentage**
Age(years)		
≤20	1	0.5
21-30	78	42.4
31-40	100	54.3
>40	5	2.7
Total	**184**	**100**
Mean±SD =	31.70±4.283	
Booking status	Frequency	Percentage
Booked	166	90.2
Unbooked	18	9.8
Total	**184**	**100**
Educational level	Frequency	Percentage
No formal education	3	1.6
Primary	3	1.6
Secondary	67	36.4
Tertiary	111	60.4
Total	**184**	**100**
Occupation	Frequency	Percentage
Civil servant	86	46.7
Housewife	45	24.5
Business	34	18.5
Professional*	2	1.1
Unemployed	10	5..4
Others**	7	3.8
Total	**184**	**100**

**Professional (Bankers); **Others (Hairdresser, Tailor, House keeper)*

As shown in table 2, most of the women were primiparous (67.4%) and the mean gestational age at delivery was 39.13±1.206 weeks. The commonest indications for the caesarean section prior to the trial of VBAC were cephalopelvic disproportion (20.7%), malpresentation (20.7%), hypertensive disorders of pregnancy (13.5%), foetal distress (12.5%) and prolonged labour (12.5%).

Table 3 shows the eventual mode of delivery following trial of VBAC. Out of the 184 women that had trial of VBAC, 36.4% had a successful VBAC while 63.6% had failed VBAC. The commonest reason for failed VBAC was cephalopelvic disproportion (51.3%), followed by poor progress in labour (28.2%) and foetal distress (11.1%).

Table 2: Obstetric Characteristics of Women Who Underwent VBAC

Characteristics	Frequency	Percentage
Parity at delivery		
1	124	67.4
2	37	20.1
3	16	8.7
≥4	7	3.8
Total	184	100
Mean ±SD =1.51±0.817		
Gestational age (weeks)	Frequency	Percentage
<37	2	1.1
37-40	159	86.4
>40	23	12.5
Total	**184**	**100**
Mean±SD = 39.13±1.206		
Indication for previous CS prior to VBAC	Frequency	Percentage
Cephalopelvic disproportion (CPD)	38	20.7
Malpresentation	38	.7
Foetal distress	23	12.5
Hypertensive disorders (Preeclampsia/Eclampsia)	25	13.5
Prolonged labour	23	12.5
Failed induction of labour	13	7.1
Multiple pregnancy	9	4.9
Placenta praevia	9	4.9
Poor progress in labour	3	1.6
Foetal macrosomia	3	1.6
Total	184	100

Maternal request and short interpregnancy interval accounted for 1.7% and 0.9% of the reasons respectively. The only case of CS for failed induction of labour was for an intrauterine foetal death (IUFD) for which the previous CS was also for an IUFD due to failure to progress. Foetal macrosomia accounted for 3.4% of the indications.

Table 3: Mode of Delivery and Reason for Emergency Caesarean Section (CS)

Variables	Frequency	Percentage
Mode of delivery	67	36.4
Vaginal delivery		
Emergency CS	117	63.6
Total	184	100
Indication for emergency CS	Frequency	Percentage
Poor progress in labour	33	28.2
Cephalopelvic disproportion	60	51.3
Foetal distress	13	11.1
Macrosomia	4	3.4
Prolonged labour	3	2.5
Maternal request	2	1.7
Failed induction of labour	1	0.9
Short interpregnancy interval	1	0.9
Total	117	100.0

Outcome	**Frequency**	**Percentage**
Foetal outcome		
Alive with good Apgar scores (≥7)	166	90.2
Alive with mild to severe asphyxia (Apgar scores<7)	13	7.1
Perinatal death	4	2.2
Intrauterine foetal death prior to VBAC	1	0.5
Total	**184**	**100**
Neonatal intensive care unit (NICU) admission	13	
Birthweight (kg)	**Frequency**	**Percentage**
<2.5	4	2.2
2.5kg-4.0	174	94.6
>4.0	6	3.2
Total	**184**	**100**
Mean ±SD 3.35±0.415		
Maternal outcome/complications	**Frequency**	**Percentage**
Primary PPH	9	15.5
Genital tract laceration	15	25.9
Blood transfusion	16	27.6
ICU admission	3	5.2
Retained placenta	2	3.4
Puerperal sepsis	4	6.9
Uterine scar dehiscence	1	1.7
Postpartum eclampsia	3	5.2
Wound infection	2	3.4
Broken down episiotomy	1	1.7
Vulva haematoma	1	1.7
Cystocele	1	1.7
Maternal death	0	0
Total	**58**	**100**

**Some women had more than one complication*

Table 4 shows the foetal and maternal outcomes and complications. Majority of the neonates were delivered alive with good Apgar scores (90.2%). There were four perinatal deaths [two immediate neonatal deaths, (INND) and two fresh stillbirths, (FSB)]. The two INND occurred in a neonate with congenital abnormality (Down's syndrome), and in an unbooked patient who presented in second stage of labour with foetal distress, while the two FSB, were in a booked patient who had had 2 previous successful VBACs presenting at 41 weeks gestation and had a vaginal delivery of a 3.2kg with meconium aspiration syndrome (MAS), and the other was in an unbooked patient referred from a Primary Health Centre (PHC) where augmentation of labour (AOL) was done before referral. 13 neonates (10 in successful VBAC versus 3 in failed VBAC) required neonatal intensive care unit (NICU) admission for various degrees of asphyxia and they were all discharged in good conditions. The mean birthweight of the neonates was 3.35±0.415kg (range 2.0kg - 4.4kg). Four out of the 11 cases of foetal macrosomia (birthweight ≥4kg) were recorded in women who had successful VBAC.

The most common maternal complications were blood transfusion 16 (27.6%; 13 in successful VBAC vs 3 in failed VBAC), followed by genital tract laceration 15 (25.9%), and primary postpartum haemorrhage 9 (15.5%). There was one case of uterine scar dehiscence. One patient who was Para 3 and had a successful VBAC developed

Table 4: Foetal and Maternal Outcome and Complications

cystocele as a late complication. Some patients had more than one complication. There was no maternal death.

Table 5: Association between VBAC and maternal and foetal characteristics

Characteristics/Variables	Successful VBAC (n=67)	Failed VBAC (n=117)	Chi square (x2)	P- value
Mean Age ±SD (years)	32.06±4.917	31.50±3.881	23.011	0.401
Booking Status				
Booked	61(91.0%)	105(89.7%)	0.082	0.775
Unbooked	6(9.0%)	12(10.3%)		
Parity				
Primiparous	32(47.8%)	90(76.9%)	16.271	0.000*
Multiparous	35(52.2%)	27(23.1%)		
Educational level				
Educated	65(97.0%)	116(99.1%)	1.206	0.272
Not educated	2(3.0%)	1(0.9%)		
Gestational Age (weeks)				
<40	45(67.2%)	60(51.3%)	4.386	0.036*
≥40	22(32.8%)	57(48.7%)		
Previous successful VBAC	7(87.5%)	1(12.5%)	9.427	0.002*
Yes	60(34.1%)	116(65.9%)		
No				
Apgar score at 1 minute				
< 7	7(10.4%)	20(17.1%)	1.503	0.220
> 7	60(89.6%	97(82.9%)		
Mean birth weight ±SD (kg)	3.29±0.449	3.39±0.392	31.134	0.071

The association between VBAC and maternal and foetal characteristics is shown in table 5. A higher rate of successful VBAC was recorded in multiparous compared with primiparous women and this was statistically significant (x^2 = 16.271, p=0.000). Similarly, there was a significant association between the rate of successful VBAC and gestational age at delivery less than 40 weeks (x^2 =4.38, p=0.036). A total of eight women had a history of previous successful VBAC and 7 of them had another successful VBAC in this study and this was statistically significant (x^2 =9.427, p=0.002). The remaining woman had emergency CS due to foetal distress with uterine scar dehiscence. There was no significant difference in the mean Apgar scores and birthweights of the neonates delivered vaginally and those delivered by emergency CS due to failed VBAC (x^2 =1.503, p=0.220; x^2 =31.134, p=0.071 respectively). Also, no significant association was noted with regards to the booking status, educational level, and mean ages of those who had vaginal delivery and those who had emergency CS.

DISCUSSION

This study shows a VBAC success rate of 36.4% in our facility with a failure rate of 63.6%. It also reveals a high CS rate of 43.6% with emergency CS resulting from failed VBAC accounting for 3.3% of all CS during the study period. The successful VBAC rate of 36.4% is low compared to the reported rates of 60-80% in developed countries[4,10] and other studies in the sub-Saharan African region where success rates in excess of 40% have been recorded.[7,9,13,14,17-22]

The finding is, however, comparable with rates reported by Eleje et al[12] in Nnewi, Nigeria (33.8%), and Masina et al[15] in Pretoria, South Africa (36%).

The low success rate of VBAC in our facility may be attributed to the fact that the decision to terminate a trial of VBAC is most often taken by the attending physician due to the fear of possible uterine rupture and medico-legal concerns for adverse outcome in the face of challenging health system resources. In addition, induction and augmentation of labour are contraindicated in trial of VBAC in our facility, thus, CS is the only option for VBAC patients with prolonged labour or poor progress in labour due to inefficient uterine contractions where augmentation of labour could have been initiated. The decision to induce or augment labour is only taken by a senior Obstetrician (the Consultant) where necessary and this also affected the proportion of cases selected for VBAC. Although the American College of Obstetricians and Gynecologists (ACOG) recommended induction of labour as an option in women undergoing VBAC, it warned against use of misoprostol as an agent for that purpose.[4] Generally, induced or augmented labours are associated with high VBAC failure rate and increased risk of uterine rupture compared with spontaneous labours.[4,6,16] Intermittent auscultation using the Pinard stethoscope is also the common method of foetal heart rate monitoring in our facility which may account for the contribution of foetal distress as reason for emergency CS. The RCOG Green-top guidelines on VBAC recommended the use of continuous electronic monitoring for early detection of foetal heart abnormalities in cases of uterine rupture.[6] Other factors that could have contributed to the low success rate include patient selection criteria, disparity in sample sizes among studies, the period of study, and challenges of health system, including human and material resources.[9]

The commonest reasons for failed VBAC in this study were cephalopelvic disproportion, poor progress in labour, and foetal distress. This finding is similar to those reported in Nigeria by Anikwe et al[20] in a secondary Health facility in Abakaliki, and Edugbe et al[21] in a Tertiary Health facility in Jos. Similar findings were reported by Seffah et al[9] in Ghana, Masina et al[15] in Pretoria South Africa and Prabha et al in India.[16] Scar dehiscence was recorded in only one of our patients as a

complication having been noted at surgery in a woman with failed VBAC due to foetal distress. Foetal macrosomia as an indication accounted for only 3.4% of cases in contrast to findings in similar studies where it was reported as the leading indication.[12,16,24]

Blood transfusion, genital tract laceration, and primary postpartum haemorrhage were the most common maternal complications in this study as had been observed in similar studies.[15,17-20] There was no case of uterine rupture in contrast to the findings in other similar studies where various proportions of uterine rupture were reported with adverse foeto-maternal outcomes.[4-6,9,12-15,25,27] Uterine rupture with its associated maternal and perinatal morbidity and mortality has been reported as the most dreaded complication and the main deterrent to VBAC in most facilities.[25,27] There was no case of maternal death recorded in this study. This is similar to the findings in other studies.[12,14,15,17,19] The risk of maternal death in planned VBAC is reported to be considerably lower compared with elective repeat CS.[4] Generally, perinatal outcome was good, with majority of the neonates delivered with good Apgar scores. The availability of resources in our facility for early resort to emergency CS for failed VBAC cases and neonatal resuscitation could have accounted for the favourable perinatal outcomes. There were, however, four cases of perinatal death with one death unrelated to the mode of delivery.

Multiparity, gestational age at delivery less than 40weeks, and a prior history of successful VBAC were noted to be significantly associated with a higher rate of successful VBAC in this study. This is in agreement with the findings in similar studies.[10,12,13,15,16,24]

CONCLUSION

Although our VBAC success rate is low, experience from our facility shows that VBAC is safe and should be encouraged in women without contraindications to vaginal delivery as a strategy to reduce caesarean section rate. However, because failed VBAC is associated with greater maternal risks, appropriate patient selection, informed patient counselling, and adequate intrapartum monitoring are recommended for planned VBAC for improved outcomes.

Limitation of the Study: The limitation of the study lies in its retrospective nature. In addition, the study did not compare foeto-maternal outcomes of successful VBAC with that of planned elective repeat CS.

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