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## Original Research Article

# Obstetric outcomes of vaginal birth after caesarean section in Bingham University Teaching Hospital, Jos, Nigeria

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## ABSTRACT

**Background:** Objective of the study was to review the obstetric outcomes of vaginal birth after caesarean section (VBAC) in Bingham University Teaching Hospital (BhUTH).

**Methods:** A retrospective review of women planned for VBAC at BhUTH from January, 2020 to December 2021. Variables measured included gestational age at time of delivery, inter-delivery interval, and vaginal delivery before or after primary caesarean section (CS), outcome of labor, indications for repeat CS, neonatal and maternal outcomes.

**Results:** During the study period there were 1535 deliveries and 94 were planned VBAC. Of the 94, 55.3% had a repeat emergency CS while 44.7% had a successful VBAC. Successful VBAC rate was 52.4% in multipara compared to 47.6% in primipara. Repeat CS rate was 34.6% in multips and 65.4% in primiparas. The commonest indication for the repeat CS was failure to progress due to cephalopelvic disproportion, 26.9%, mal-positioning, 25.0%, fetal distress and poor uterine contractions accounted for 13.5% each. Prior vaginal delivery especially a prior VBAC was associated with a higher rate of successful VBAC, 40.5% compared to VBAC rate of 21.4% in those who had a vaginal delivery before the caesarean section. The successful VBAC rate was highest among those weighing 2.5<3.5 kg, 66.7% compared to fetal weight of <2.5 kg and ≥3.5 kg birth weight.

**Conclusions:** The VBAC rate observed is higher than what is obtainable in other centers in our country but is far less than what is obtainable in the developed societies. The maternal and perinatal morbidity and mortality are however comparable with the developed societies despite our limited facilities.

**Keywords:** VBAC, Caesarean section, Obstetric outcomes

## INTRODUCTION

Vaginal birth after caesarean section (VBAC) is currently the preferred method of delivery for pregnant women who had previous one lower segment caesarean section for a non-recurrent indication. VBAC is the best modality to reduce the overall caesarean section (CS) rate and various guidelines have been developed to guide its practice. The documented safety, effectiveness and success of VBAC is why it's been advocated in women with no contraindication to vaginal delivery.<sup>1-3</sup> With the improved safety of CS most obstetricians appear to have lost sight of the fact that CS is a major operation associated with

numerous complications.<sup>3</sup> A planned VBAC refers to any woman who has experienced a prior caesarean who plans to deliver vaginally rather than by elective repeat CS while a vaginal birth (spontaneous or assisted) in a woman undergoing planned VBAC indicates a successful VBAC. However, birth by emergency CS during the labour indicates an unsuccessful VBAC.<sup>4</sup>

It's a known fact that Nigerian women have a strong aversion for CS because of the general belief that abdominal delivery is a mark of reproductive failure; hence premium is placed on vaginal delivery.<sup>1,3</sup> Therefore any means of reducing the CS rate would be greatly

welcomed in our society. In addition, the following maternal risks significantly increase with increasing numbers of CS: placenta (previa, accreta, percreta, increta), injury to the bladder, ureters and bowel. Need for postoperative ventilation, Intensive Care Unit admission, hysterectomy and transfusion.<sup>4-8</sup>

This study aimed at determining the factors that favor VBAC in our center and to estimate the maternal and perinatal outcomes associated with VBAC. The findings will contribute towards proper patient selection for a trial of vaginal delivery and reduce the incidence of morbidity and mortality associated with failed vaginal delivery after a previous CS. For patients with failed VBAC they are at greater risks for complications compared with those with elective repeat CS without labor.<sup>9</sup> The complications of trial of labour with a previous scar include uterine rupture, blood transfusion, maternal mortality, hysterectomy perinatal morbidity and mortality.<sup>4,8,10-12</sup>

Patients planned for VBAC should be counseled adequately, delivery should be at a hospital with facilities for surgery, blood transfusion with an anesthesiologist and neonatologists available. The patients should also be placed on continuous fetal monitoring as fetal tachycardia is the first sign of uterine rupture.<sup>4,7,12</sup> In Bingham University Teaching Hospital (BhUTH) for a patient to qualify for VBAC she must have had a prior single lower segment transverse uterine incision, inter-delivery interval of at least fifteen months, singleton cephalic fetus with no recurrent or persistent indication for elective repeat CS. However, in developed societies and centers where adequate facilities for monitoring are available patients with multiple gestations, two previous lower segment CS can be allowed a trial of labour.<sup>1,4,6</sup> In certain states in the US due to the increase in home births there's also an increase in the planned home VBAC but this practice is not encouraged.<sup>13</sup> The contraindications to trial of labour with a previous scar are previous classical scar, hysterotomy or breech of endometrium, uterine rupture, obstetric contraindication and if the patient declines.

## METHODS

This was a hospital based retrospective analysis of the clinical records of all pregnant women planned for vaginal birth after caesarean section (VBAC) from January 2020 to December 2021 at the Bingham University Teaching Hospital. Data was retrieved from the labour ward records and the doctors post call records.

Information obtained at the time of delivery included maternal age, parity, gestational age at time of delivery, indication for primary caesarean section, inter-delivery interval, vaginal delivery before or after the primary CS. Others included the cervical Os dilatation at presentation, outcome of the trial of labour, birth weight, APGAR scores and associated complications (uterine dehiscence, uterine rupture, post-partum haemorrhage and blood transfusion.

Statistical analysis was done using IBM-statistical package for the social sciences (SPSS) version 22.0

## Inclusion criteria

All patients with one previous lower segment transverse incision, singleton fetus in cephalic presentation, and absence of a recurrent factor were included.

## Exclusion criteria

Patients with more than one previous CS, inter-delivery interval of less than 15 months, and patients planned for repeat elective CS were excluded.

## RESULTS

During the study period, there were 1535 deliveries and 94 women who had a previous caesarean section attempted a trial of vaginal delivery. The incidence of patients planned for VBAC in our center for the study period was 6.1% however the overall successful VBAC rate was 42 (44.7%) while the repeat emergency CS was 52 (55.3%).

Of the 3 patients over the age of 40 years, 1 (2.4%) had a successful VBAC while the remaining 2 (4.8%) had a repeat CS. The highest successful VBAC and CS rate were among the 30-39 years age group accounting for 25 (59.7%) and 26 (49.4%) respectively. The 20-29 year age group had VBAC in 16 (38.9%) and CS in 24 (45.5%).

The multiparas had a successful VBAC rate of 22 (52.4%) as against the primiparas with 20 (47.6%). The repeat CS rate among the multiparas and primiparas were 18 (34.6%) and 34 (65.4%) respectively.

The indications for the primary CS ranged from prolonged labour 32 (34.0%), fetal distress 17 (18.1%), malpresentation 15 (16.0%), malposition 9 (9.6%), pregnancy induced hypertension 8 (8.5%), cephalo-pelvic disproportion 7 (7.4%) retroviral disease 5 (5.3%), bad obstetric history and elderly primigravida were 1 (1.1%).

The indications for the repeat CS for the 52 (55.3%) who had repeat CS were as follows; cephalo-pelvic disproportion 14 (26.9%), mal-positioning 13 (25.0%), fetal distress in first stage of labor accounted 8 (15.4%), inadequate uterine contractions accounted for 7 (13.5%) while antepartum haemorrhage and prolonged latent phase accounted for 5 (9.6%) each of the total CS.

The inter-delivery interval (IDI) was grouped into those within 15-24 months, 25-36 months and greater than 36months. The IDI was then compared with the outcome of labor. The successful VBAC rate for those within 15-24 months was 11 (26.2%) and 30 (57.7%) for repeat CS, among the 25-36 months group 9 (21.4%) had a successful VBAC while 15 (28.8%) had a repeat CS and for those with an IDI of greater than 36 months had a successful VBAC rate of 22 (52.4%) and 7 (13.5%) had a repeat CS.

For the complications noted at repeat CS or laparotomy uterine dehiscence occurred in 2 (2.1%) and uterine rupture 3 (3.2%) accounted for the complications noted at surgery.

The neonatal outcome assessed using the 5<sup>th</sup> minute APGAR scores, no cases of severe birth asphyxia, but moderate birth asphyxia accounted for 5 (5.3%), mild asphyxia for 8 (8.5%) and 81 (86.2%) had normal APGAR scores at 5 minute. Still births occurred in 4 (4.2%), 1 (25.0%) was due to uterine rupture and the remaining 3 (75.0%) occurred following VBAC.

**Table 1: The age range and parity of the patients.**

Variables	Frequency	Percent
<b>Age</b>		
20-29	40	42.5
30- 39	51	54.3
>40	3	3.2
Total	94	100
<b>Parity</b>		
Primiparity	54	57.5
Multiparity	40	42.5
Total	94	100

**Table 2: Gestational age and the mode of delivery.**

Gestational age (weeks)	Frequency n (%)	VBAC (%)	Cesarean section (%)
<36	5 (5.3)	2 (4.8)	3 (5.7)
36–37	26 (27.7)	10 (23.8)	16 (30.8)
38–40	51 (54.2)	25 (59.5)	26 (50.0)
>40	12 (12.8)	5 (11.9)	7 (13.5)
<b>Total</b>	<b>94 (100)</b>	<b>42 (100)</b>	<b>52 (100)</b>

VBAC: Vaginal birth after caesarean

**Table 3: Outcome of labour compared with cervical os dilatation at presentation.**

Cervical os dilatation (cm)	VBAC (%)	CS (%)
<4	0	14 (26.9)
4-6	16 (38.1)	31 (59.6)
7-10	26 (61.9)	7 (13.5)
<b>Total</b>	<b>42 (100)</b>	<b>52 (100)</b>

VBAC: Vaginal birth after caesarean, CS: caesarean section

**Table 4: Birth weight compared to the outcome.**

Birthweight (kg)	VBAC (%)	CS (%)
<2.5	4 (9.5)	4 (7.7)
2.5 to <3.0	16 (38.1)	7 (13.5)
3.0 to <3.5	12 (28.6)	21 (40.3)
3.5 to <4	9 (21.4)	13 (25.0)
≥4.0	1 (2.4)	7 (13.5)
<b>Total</b>	<b>42 (100)</b>	<b>52 (100)</b>

VBAC: Vaginal birth after caesarean, CS: caesarean section

**Table 5: Effect of vaginal delivery on outcome of labour.**

Mode of delivery	Vaginal delivery before (%)	No vaginal delivery before (%)	Vaginal delivery after (%)	No vaginal delivery after (%)
<b>VBAC (42)</b>	9 (21.4)	33 (78.6)	17 (40.5)	25 (59.5)
<b>CS (52)</b>	16 (30.8)	36 (69.2)	5 (9.6)	47 (90.4)

VBAC: Vaginal birth after caesarean, CS: caesarean section

## DISCUSSION

The VBAC rate in our center was 44.7% which is comparable to the 46.7% rate in Nnewi, higher than the 38.3% in Benin, far lower than what is obtainable in developed societies where it ranges from 69% to 73.3% in US while in Canada a rate of 76.6 is obtainable.<sup>1,3,4,11-14</sup> This is probably because women with twin gestation, induction of labour with Foleys catheter, macrosomia and sometimes two previous CS are allowed to labour.<sup>4,6</sup> Meanwhile in our center the presence of these in a woman with a previous scar would result in an elective repeat CS since we don't have the required facilities to monitor these women and the manpower to ensure that an emergency CS is carried out within 15 mins.

The commonest indication for a repeat emergency CS was failure to progress due to Cephalopelvic disproportion (CPD) and is similar to the study in, Benin, Makurdi where CPD accounted for the most common indication for emergency CS.<sup>1,15</sup> In Jos, in 2002 and 2010 the commonest indication for elective CS was a repeat CS therefore we need to reduce our primary CS rate so that we don't have more patients with uterine scars in their subsequent pregnancies.<sup>16</sup>

Women who had a vaginal delivery especially after the primary CS the VBAC rate at 40.5% was higher than in the 9.6% who had a prior vaginal delivery but had a failed VBAC. A prior VBAC is associated with a higher rate of successful trial of labor compared to prior vaginal delivery.<sup>5,9</sup> The effect of vaginal delivery resulting in VBAC in US is 89.9% compared to 67.0% in those with no prior vaginal delivery and in Benin those with vaginal delivery had a 54.2% successful VBAC and 22.4% had failed VBAC.<sup>1,10</sup> Some studies have however, shown that there's no difference in VBAC success among women with no prior vaginal deliveries 70.4% compared to 77.5% with prior vaginal delivery.<sup>17</sup>

Women with neonatal weights exceeding 3.5 kg have less rate of successful VBAC which is similar to the study in India where the neonatal weights exceeding 3 kg was associated with less chances of successful VBAC.<sup>5</sup> Macrosomia on its own is not a contraindication for VBAC, but the chances of successful VBAC declines with

macrosomia and is similar to what we obtained in our study where out of the 8 (8.5%) macrosomic babies only 1 (2.4%) was delivered via VBAC.<sup>4,7</sup>

Postdatism is also not a contraindication for VBAC but the success rate also declines with increasing gestational age and VBAC rates are better for those in who labour is spontaneous compared to induced.<sup>4,14,18</sup> We had 12 (12.8%) of patients greater than 40 weeks of gestation and 5 (41.7%) of them had a VBAC compared to 7 (58.3%) with failed VBAC. In US women beyond 40 weeks 35.4% compared to 26.7% failed VBAC for the other gestational ages.<sup>11</sup> Induction of labour though not done routinely in our center because of lack of facilities to monitor the labour is not contraindicated, but the risk of repeat CS increased if the cervix is unfavorable and there is a statistically significant albeit small increase in maternal morbidity in women with no prior vaginal delivery.<sup>14</sup> Oxytocin induction is not contraindicated but medical induction is associated with uterine rupture.<sup>4,7,12</sup>

The inter-delivery interval calculated in months from the prior delivery and index trial of labour in our center is a minimum of 15 months. This is because postpartum restoration of the lower segment hysterotomy may require at least 6 - 9 months suggested by Magnetic Resonance Imaging studies, plus the 9 months of gestation.<sup>17</sup> The inter delivery interval of greater than 36 months had the highest rate of VBAC 52.4% compared to 26.2% and 21.4% in the 15 - 24 months and 25 - 36 months respectively. The CS rate was highest in the 15-24 months group at 57.7% compared to 13.5% in the greater than 36 months. This finding is also similar to a study where the VBAC success was 79% for patients with an inter-delivery interval of less than 19 months compared to 85.5% when the inter delivery interval was greater than or equal to 19 months.<sup>17</sup> Another study showed that when the inter-delivery interval was greater than 24 months the VBAC success rate was 78.3% and 21% when less than 24 months.<sup>5</sup> Risks of uterine rupture is two to threefold for women with a short inter delivery interval (below 12-24 months).<sup>7</sup>

Adverse perinatal outcomes assessed using the 5<sup>th</sup> minute APGAR scores none of the babies was severely asphyxiated. However, 5.3% and 8.5% had moderate birth and mild asphyxia respectively, 86.2% were not asphyxiated. Approximately 4% were stillborn, and of the 4 cases of still births 1 births occurred following uterine rupture, while the remaining occurred following successful VBAC, two were diabetic mothers and the other one there was no identifiable cause. This is higher than a similar study where the adverse perinatal outcome occurred in 0.13% - 0.40% and adverse perinatal outcomes occurred even among those without labor.<sup>12</sup>

Complications noted during the repeat CS included uterine dehiscence in 2 (2.1%) of the total study population and uterine rupture in 3 (3.2%). The 3 patients that had uterine rupture had to be transfused because of the blood loss. This is higher than in Canada where rates of 0.40% and 0.06%

for vaginal delivery and elective repeat CS respectively and in US where rate of 0.32%.<sup>4,12</sup> Uterine rupture is one of the most dreaded complications of trial of labour and is the complete separation of the uterine muscle and the serosa unlike in dehiscence where the serosa is intact. It's associated with increased maternal and perinatal morbidity and mortality.<sup>18</sup> The general risks of uterine rupture 0.5-2% in multiparous women, but in lower segment transverse incision; 0.2-1.5%, 1.0-1.6% for lower segment vertical incision and 4-9% for classical incision.<sup>4,17</sup>

## CONCLUSION

The VBAC rate in our center is comparable to others in our country but far less than in developed societies. However, the low maternal morbidity and low perinatal morbidity and mortality in this study are good signs considering the lack of advanced monitoring facilities in our center. The ability to predict women who are at high risk of failed VBAC and those with high probability of successful VBAC would help guide clinicians and women in making good clinical decisions and minimizing adverse events. Obstetricians should continue to counsel patients regarding trial of VBAC based on current established guidelines. Trial of labour after CS should therefore be considered in women who have no contraindications after appropriate discussion. The efficacy and safety of a trial of labour after caesarean as demonstrated in the study in properly selected patients in a hospital where facilities for monitoring are available has a good outcome.

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