

Outcome of Planned Vaginal Birth at Term after One Previous Caesarean Section

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ABSTRACT

Background & objective: Pregnant women with a previous caesarian section may be offered either vaginal birth or elective repeat caesarian section (ERCS). Detailed antenatal counseling and methodical intrapartum management of women are the key factors for success of planned vaginal birth after caesarean (VBAC). The present study was undertaken to determine the incidence of successful vaginal birth and the maternal and perinatal complications in patients undergoing planned vaginal birth after one previous caesarean section.

Methods: This prospective observational study was carried out in the Department of Obstetrics and Gynaecology, Sir Salimullah Medical College & Mitford Hospital (SSMC & MH), Dhaka over a period of one year between January to December 2016. A total of 96 term pregnant women, aged 20 – 35 years, having previous experience of one lower uterine caesarean section with spontaneous onset of labour, vertex presentation of the fetus and adequate pelvis were consecutively included in the study. The main primary outcome variable was fate of trial VBAC (successful vaginal delivery either spontaneous or assisted or ERCS). The secondary outcome variables were maternal and perinatal complications (morbidity and mortality).

Result: Over 55% of the women under trial VBAC were 25 – 30 years old with mean age of the women being 26.8 ± 3.7 years. Nearly three-fifths (58.3%) of the women were of normal BMI, 40.6% were overweight. None of the women was obese. Only 15% women had gestational age 40 weeks. The mean interval between the current and the previous births was almost 3 years. In terms of primary outcome, over 60% of the planned VBAC were successfully delivered (52.2% spontaneously and 9.3% with the aid of forceps and vacuum extraction). While maternal complications were uterine rupture (6.2%), hysterectomy (6.2%) and haemorrhage needing transfusion (14.6%), neonatal complications were respiratory distress syndrome (17.7%), perinatal death (10.4%), hypoxic ischemic encephalopathy (4.2%) and sepsis (8.3%).

Conclusion: The study concluded that planned VBAC is appropriate for majority of women with a singleton pregnancy of cephalic presentation who have had a single previous lower segment caesarean section (LSCS). However, as the maternal complications (like hysterectomy, haemorrhage etc.) and the perinatal complications including death were much high, utmost caution is advised in selecting the right candidate for VBAC so that the incidence of successful VB could be maximized and complications minimized.

Key words: Planned vaginal birth after single caesarean section, past one caesarean section, outcome etc.

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INTRODUCTION:

There is wide spread public and professional concern about the increasing proportion of births by caesarian section¹ Increasing rates of primary caesarian section have led to an increased proportion of the obstetric population who have a history of prior caesarian delivery. Pregnant women with a previous caesarian section may be offered either planned VBAC (vaginal birth after caesarian section) or ERCS (Elective repeat caesarian section). The proportion of women who decline VBAC is, in turn, a significant determinant of overall increased rates of caesarian birth.²⁻⁴

Planned VBAC refers to any woman who had experienced a prior caesarean birth and plans to deliver vaginally while birth by caesarean section according to prior plan is called elective repeat caesarean section (ERCS). Women undergoing planned VBAC if ends up in vaginal birth either spontaneous or assisted indicates successful VBAC. In recent decades the caesarian section rates have continued to rise. The preliminary results of Bangladesh Demographic and Health Survey (DHS) found 23% births through caesarean section (CS) in 2014, six percentage point higher than the 2011 data. Over one-third (35%) of cesareans may be performed because the woman has had previous cesarean delivery.⁵ trend continues because of the fears of the perceived risks of VBAC to the mother and her fetus⁶ as well as possible litigation pressures.⁷

Each option, elective CS or labour with a view to vaginal birth, has its benefits and risks. Differences in patients profile give rise to variation in patient preference, risk spectrum and of success of vaginal births. Induced labor, no previous vaginal birth, a BMI greater than 30 kg/m² and previous CS for dystocia are factors that all reduce the success rate. Other factors which have been reported to adversely affect success rates are gestational age beyond 41 weeks, fetal macrosomia, advanced maternal age, short stature and fetal malpresentation.⁷⁻⁹ In contrast, there has been a wide range of success rates (23-85%) reported for

those undergoing vaginal birth following a planned VBAC.^{7,8,10,11} Published studies of the outcomes for woman attempting VBAC report a likelihood of success between 60 – 80%.¹² A number of factors is associated with successful VBAC. Previous vaginal birth, especially successful VBAC is the strongest predictor of success, with VBAC rates ranging from 87-91%.⁷⁻¹¹

So, patients and clinicians conjointly need to consider each variable to plan mode and place of birth for women who have had a previous caesarian delivery. There are numerous retrospective studies which provide some evidences to which decision making is based, but these are subject to variation both with respect to population and management setting.^{10,13-16} A woman should be well-informed regarding mode of birth after previous CS and should have the right to have her wishes respected.^{12,17,18} Respect should be given to the woman's right to be involved in the informed decision-making regarding mode of birth, considering her wishes, her perception of the risks (supported professional experts) and her plans for future pregnancies.¹⁹ Vaginal birth after caesarean may be complicated by uterine rupture or scar dehiscence, hysterectomy, thromboembolism, hemorrhage, viscus injury (bowel, bladder, ureter), endometritis, maternal death etc.. There may be adverse perinatal outcome after VBAC like respiratory distress syndrome, hypoxic ischemic encephalopathy, perinatal death etc.²⁰ In spite of these demerits of VBAC, there are lot of benefits of VBAC as well like less maternal morbidity for index and future pregnancies, earlier mobilization and discharge from hospital, patient satisfaction etc. But there are very few studies which have evaluated the safety of planned VBAC. Studies are, therefore, needed to identify potential strategies to improve perinatal outcomes and help guide physicians and patients in choosing optimal methods of delivery after one CS. The present study was therefore aimed to determine the incidence of successful vaginal birth and the maternal and perinatal outcome in patients undergoing trial VBAC.

METHODS:

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, SSMC & MH, Dhaka over a period of one year between January to December 2016. A total of 96 patients were consecutively included in the study. The women at term pregnancy with a history of one previous LSCS with spontaneous onset of labor pain were the study population. Other eligibility criteria were height of patients more than 5 feet, cephalic presentation of the fetus, confirmed adequate pelvis etc. Previous history of placenta previa, systemic illness in the current pregnancy demanding LSCS, malpresentation, multiple pregnancy, obesity, patients with previous T or J incision in C/S, patients with history of stormy puerperium were excluded from the study. The study commenced on obtaining ethical clearance from Ethical Review Committee of Sir Salimullah Medical College and Mitford Hospital, Dhaka concerned authority and informed consent from the patients. Systemic and obstetric examinations were done for maternal and fetal well-being. Scar tenderness was elicited on admission and onset of labor. Before attempting VBAC all women willing for vaginal delivery were informed about the risks, benefits, potential complications and alternatives to a trial for a VBAC. During labor following tasks were done:

Blood was sent for grouping and cross-matching and was kept ready in case if needed to be transfused. Provision for admission to maternal and neonatal ICU was also kept ready. Mothers were on close monitoring during labor with regular checking of the vital signs. Fetal heart rate was recorded at half hourly interval. Progress of labor was monitored by partograph. Mothers were monitored for scar dehiscence, such as, hypotension, tachycardia, abdominal tenderness. Intrapartum fetal monitoring was carried out with the help of cardiotocography. Oxytocin was administered in 5% DNS at the rate of 0.5-1 MU/ml and increased till establishment of a satisfactory labor pattern, but not more than 2 MU/ml. The "six-hour rule" was observed by partograph

recording in active labor, where planned VBAC was terminated within 6 hours of starting of active labor. After delivery all patients were monitored at ½ hourly interval for next 6 hours. Subsequent complication and condition of the mothers and babies was evaluated till discharge from the hospital. Maternal morbidities like uterine rupture, uterine dehiscence, haemorrhage with requirement of blood transfusion, viscus injury, hysterectomy, thromboembolism, endometritis and death if occurred were duly noted. Fetal morbidities like respiratory distress syndrome, hypoxic ischaemic encephalopathy, need for resuscitation, sepsis and perinatal death were recorded. Data were processed and analyzed using SPSS (Statistical Package for Social Science) for Windows, Version 16. The test statistics used to analyze the data were descriptive statistics and Chi-square (χ^2) or Fisher's Exact Probability Test with level of significance being set at 5% and p-value < 0.05 was considered significant.

RESULTS:

Over 55% of the women were 25-30 years old with mean age being 27 years. Almost two-thirds (65.6%) belonged to middle class (Table I). More than two-thirds (77.1%) maintained a birth spacing of 2-3 years after their 1st cesarean. Majority (84.4%) was at term pregnancy with mean gestational age being 38.3 weeks. Past history of abortion was found in 21.9% and past history of MR in 4.2% women. Most (88.6%) of the patients experienced pregnancy 2-3 times before the current pregnancy. Over one-quarter (28.1%) was anaemic (Table II).

In 25% cases trial VD failed and emergency caesarean section had to be done. Other complications encountered were haemorrhage (16.7%) needing blood transfusion (14.6%), uterine rupture (6.2%), viscus injury (3.1%) and uterine scar dehiscence (2.1%). Hysterectomy had to be done in 4.2% cases. More than half (52.2%) of the trial VBAC was successful, 9.4% needed instrumental assistance (6.2% forceps and 3.1% vacuum extraction). Of the failed VABC, 30(31.2%)

needed emergency cesarean section and 7(7.3%) required hysterectomy (Table III).

Majorities of neonates exhibited APGAR > 7 at 1 and 5 minutes of birth (81.2 and 84.4% respectively) and 18% neonates were admitted in NICU for resuscitation and 23% stayed in the hospital for > 3 days with mean hospital stay being 2.5(range:1-7) days. Sepsis was diagnosed in 8.3% cases. Foetal laceration was rarely found (1%). Respiratory distress syndrome was observed in 17.7% and hypoxic ischemic encephalopathy in 4.2% neonates. Perinatal death resulted in 10.4% of neonates (Table IV).

Associations between maternal complications and outcome of trial VBAC is illustrated in table V. Of the 5 complications, uterine rupture, haemorrhage, viscus injury and need for blood transfusion were significantly higher in patients with unsuccessful outcome trial VBAC than those in patients with successful outcome (p=0.003, p=0.031, p=0.003 and p=0.006 respectively). All perinatal complications (but hypoxic ischemic encephalopathy) were found to be associated with unsuccessful outcome (p<0.05). However, incidence of hypoxic ischemic encephalopathy was considerably higher in the former group than that in the latter group (p=0.158) (Table VI).

Table I. Demographic and anthropometric characteristics of study subjects (n = 96)

Characteristics	Frequency	Percentage
Age (years)		
20 – 25	18	18.8
25 – 30	53	55.2
≥ 30	25	26.0
Socioeconomic status		
Poor	2	2.1
Middle class	63	65.6
Upper middle class	26	27.1
Rich	5	5.2
BMI (kg/m2)		
Normal	56	58.3
Overweight	39	40.6
Under weight	1	1.0

*Mean age = 26.8 ± 3.7 years; range: 20 – 35 years

Table II. Distribution of women by their obstetric characteristics

Obstetric characteristics	Frequency %	Mean ± SD (Range)
Interval after 1st cesarean (yrs.)		
2 – 3	74(77.1)	2.9 ± 0.7 (2-5)
4 – 5	22(22.9)	
Gestational age (wks.)		
37 – 39 (Term)	81(84.4)	38.3 ± 0.9 (37-40)
40 (Full-term)	15(15.6)	
Past H/O abortion	21(21.9)	
Past H/O MR	4(4.2)	
Anaemia	27(28.1)	

Table III. Distribution of patients by maternal outcome and complications of trial VBAC

Outcome and complications of trial VBAC	Frequency	Percentage
Outcome		
Successfully completed	50	52.2
Emergency LUCS	30	31.2
Hysterectomy	7	7.3
Vacuum extraction	3	3.1
Forceps	6	6.2
Complications		
Emergency caesarean done	24	25.0
Primary postpartum haemorrhage	16	16.7
Blood transfusion needed	14	14.6
Uterine rupture	6	6.2
Uterine scar dehiscence	2	2.1
Viscus injury (urinary bladder)	3	3.1
Hysterectomy needed	4	4.2

Table IV. Cardiopulmonary status of new-born

APGAR score	Frequency	Percentage
Cardiopulmonary status of new-born		
APGAR score at 1 minute		
> 7	78	81.2
≤ 7	18	18.8
APGAR score at 5 minutes		
> 7	81	84.4
≤ 7	15	15.6
Emergency measures and hospital stay		
NICU admission	17	17.7
Need for resuscitation	17	17.7
Hospital stay* (> 3 days)	22	22.9
Trauma and other complications		
Sepsis	8	8.3
Foetal laceration	1	1.0
Respiratory distress syndrome	17	17.7
Hypoxic ischemic encephalopathy	4	4.2
Perinatal death	10	10.4

*Mean age = 2.5 ± 1.6 days; range: (1 – 7) years

Table V. Association between maternal complications and outcome of trial VBAC

Maternal complications	Outcome of trial VBAC		p-value
	Unsuccessful (n = 37)	Successful (n = 59)	
Uterine rupture**	6(16.2)	0(0.0)	0.003
Hemorrhage*	10(27.0)	6(10.2)	0.031
Uterine scar dehiscence**	2(5.4)	0(0.0)	0.146
Viscus injury**	6(16.2)	0(0.0)	0.003
Transfusion needed*	10(27.0)	4(6.8)	0.006

Figures in the parentheses indicate corresponding %;

*Chi-squared Test (χ^2) was done to analyze the data.

**Fishers Exact test was employed to analyze the data.

Table VI. Association between perinatal complications and outcome of trial VBAC

Perinatal complications	Trial VBAC		p-value
	Unsuccessful (n = 37)	Successful (n = 59)	
AOGAR 1 min (≤ 7)	13(35.1)	5(8.5)	0.001
AOGAR 5 min (≤ 7)	10(27.0)	5(8.5)	0.015
Respiratory distress syndrome	11(29.7)	6(10.2)	0.015
Hypoxic ischemic encephalopathy	3(8.1)	1(1.7)	0.158
Sepsis	6(16.2)	2(3.4)	0.035
Foetal laceration	1(1.7)	0(0.0)	0.615
Perinatal death	8(21.6)	2(3.4)	0.004
Hospital stay (>3 days)	22(59.5)	0(0.0)	< 0.001

Figures in the parentheses indicate corresponding %;

*Chi-squared Test (χ^2) was done to analyze the data.

DISCUSSION:

There has been continued debate about defining an acceptable caesarean delivery rate and what rate achieves optimal maternal and infant outcomes. Despite this ongoing debate, the trend of primary caesarean is on the rise all over the world including Bangladesh. Hence, counselling of women for and managing birth after previous caesarean delivery are important issues. Women often have to choose either vaginal birth or elective repeat caesarean delivery. In the absence of randomized controlled trials comparing outcomes between these two modes of delivery, it is difficult to provide informed choice to the potential candidates. Frequently, maternal risks of a failed trial of labor with uterine rupture being recognized as an uncommon but catastrophic complication, caesarean delivery with its associated operative morbidity is often presented to the mother. Thus, the old postulate:

“Once caesarean, always caesarean” leads to repeated caesarean sections in women who have had previous caesarean section, so are more frequent cases with 2 and 3 caesarean sections.²¹⁻²³ In the present study over 60% of the planned VBAC were successfully completed (52.2% spontaneously and 9.3% with the aid of forceps and vacuum extraction). Quite consistent with these findings El-Ardat and associates²⁴ in a study in Sarajevo demonstrated a success rate of 64%. Mankuta and colleagues²⁵ reported success rate of attempted vaginal birth after cesarean section to be 50%. Lyndon-Roche and associates²⁶ observed a success rate in 60%,²⁷ Brattelet al²⁷ in 65.6% and Haller et al²⁸ in 30.7% of cases. A randomized controlled trial showed a VBAC success rate of 59% (535/903 VBAC labours).¹⁰ Thus, it is evident from the present study and the studies conducted around the world, success rate of planned VBAC may range from as low as 30% to as high as 74%.²⁹ There are often differences in VBAC success rates between centers and published studies, so consideration should be given to counseling women using locally derived VBAC success rates given the pragmatic differences in population, induction/ non-induction VBAC policies and healthcare provision. There is a consensus among National Institute for Health and Care Excellence,³⁰ Royal College of Obstetricians and Gynaecologists,¹⁷ American College of Obstetricians and Gynecologists [ACOG]/ National Institutes of Health [NIH]^{12,31,32} that planned VBAC is a clinically safe choice for the majority of women with a single previous lower segment caesarean delivery. Such a strategy would also at least limit any escalation of the caesarean delivery rate and maternal morbidity associated with multiple caesarean deliveries.³³⁻³⁷ The wide variation in success rates can be explained by demographic, anthropometric, obstetric and clinical characteristics of the women selected for planned VBAC which need to be discussed so that obstetricians may help women willing to undergo trial of labour after first caesarean (TOLAC) in order to maximize the success rate and minimize maternal and perinatal morbidity and mortality.

Several pre-admission- and admission-based multivariate models have been published to predict the individualized likelihood of VBAC success.^{8,38-40} Importantly, women at increased risk of unsuccessful VBAC are also at increased risk of uterine rupture, including catastrophic rupture leading to perinatal death.^{8,41,42} Greater maternal height, maternal age less than 40 years, BMI less than 30, gestation of less than 40 weeks and foetal weight appropriate for or lower than index caesarean delivery are associated with an increased likelihood of successful VBAC.^{17,38,40} In addition, spontaneous onset of labour, vertex presentation, fetal head engagement or a lower station, and higher admission Bishop score also increase the likelihood of successful VBAC.^{7,39,40, 43,44} Successful VBAC is more likely among women with previous caesarean for fetal malpresentation (84%) compared with women with previous caesarean for either labour dystocia (64%) or fetal distress (73%) indications.^{7,19} In the present study none of the women was > 35 years old and none was obese (BMI \geq 30 kg/m²) and only 15% women had gestational age 40 weeks and the mean interval between the current and the previous births was almost 3 years. These criteria might be attributed to higher success of planned VBAC in the present study.

However, alongside success rates, maternal and perinatal complications need to be discussed. In the present study uterine rupture was reported to be 6.2% which is much higher compared to other studies. The US Agency for Healthcare Research and Quality (AHRQ) meta-analysis and studies from the UK, Australia and Ireland reported a VBAC uterine rupture risk of 0.5%³² 0.2%³⁵ 0.33%¹⁴ and 0.2%⁴⁵ respectively. Other complications like hysterectomy (6.2%) and transfusion needed (14.6%) were also much higher compared to NICHD study which showed the risk of uterine rupture to be 2.4%, hysterectomy to be 0.6%, need for transfusion 4.4% and endometritis 8.9%.¹⁹ The perinatal complications particularly perinatal death was unwantedly high (10.4%). So, caution should be exercised in selecting the

candidate for VBAC so that the incidence of maternal and perinatal complications could be reduced to bare minimum.

The incidence of caesarean sections in our country has been increasing at a galloping pace for the last several years. The increasing trend has reached a percentage of 23% in 2014. Many women after giving birth by caesarean section are usually reluctant for a new pregnancy-birth. According to some studies it occurs in 43.8% of cases. As most of the caesarean sections are done on primipara, it is clear that large numbers of women with caesarean section remains with one child (without attempts for further pregnancies).^{22,46,47} Real indications for caesarean section are often contradictory with obstetrics findings and as there is no option for caesarean section on personal request, the staggering increase raises doubt about the real indications. In order to put an end to such practices there are attempts to get those women who underwent caesarean section in a previous pregnancy to give birth in second pregnancy vaginally if maternal and fetal conditions permit.

There is a consensus, endorsed by evidence-based systematic reviews^{32,48} and clinical guidelines,^{17,30,31} that planned VBAC is a safe and appropriate mode of delivery for the majority of pregnant women with a single previous lower segment caesarean delivery. The findings of the present study also put concurrence to these studies. However, a review of the previous caesarean delivery records and current pregnancy recommends to identify contraindications to VBAC. The present study had several limitations which must be considered before generalizing the findings to the reference population.

Limitations:

1. The sample size was small compared to the calculated sample size, which might have affected validity of the findings.
2. CTG was supposed to be used for foetal monitoring, but it was not feasible to use the device in every cases.

CONCLUSION:

From the findings of the study, it can be concluded that planned VBAC is appropriate for and may be offered to the majority of women who have had a single previous lower segment caesarean delivery with a singleton current pregnancy with fetal cephalic presentation at 37 weeks or beyond. However, the study demonstrated a much higher maternal complications like hysterectomy and need for blood transfusion compared to other studies conducted around the world. The perinatal complications were also commendably high.

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