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Original Research Article

A Prospective Case-Controlled Analysis of the Vaginal Birth with Previous Caesarean Section and its Outcome

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Conflict of interest: Nil

Abstract:

Aim: The aim of the present study was to analyse the vaginal birth with previous caesarean section and its outcome.

Methods: This prospective controlled clinical study was department of obstetrics and Gynaecology over a 1-year period. During the study period there were 150 women who had undergone previous caesarean section. Out of them, 100 women (66.66%) fulfilled our criteria and were included in the study. A control group (n = 100) was matched from women without previous caesarean section.

Results: There were no significant differences between the study group and control group in terms of age, parity, gestational age or obstetric and medical history. Oxytocin was used to augment labour in 8 cases (8%) but there was no uterine rupture recorded in these cases. Overall there were 2 cases (2%) of uterine dehiscence and 1 case (1%) of uterine rupture among the VBAC group. There were no maternal deaths and only 1 stillbirth after the case of uterine rupture. There was no significant difference between the groups in Apgar scores; 5% of neonates in the VBAC trial group had Apgar score < 6 compared with 5% in the control group (P > 0.05). We found 2 neonates (2%) weighed > 3500 g but < 4000 g in the case group. Of the women who successfully delivered vaginally, 75 (75%) were admitted during the first stage of labour and 25 women (25%) in the second stage versus 78 (78%) and 22 (22%) respectively in the control group.

Conclusion: On the basis of these results, we conclude that for selected cases with one prior lower segment caesarean section who present in spontaneous active labour, a trial of vaginal delivery may have a high success rate with no increased risk of maternal and fetal morbidity or mortality.

Keywords: Vaginal Birth, Caesarean Section, Outcome.

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Introduction

The World Health Organization (WHO) has reported that the cesarean section (CS) rate has increased in the world. [1] Cesarean section is significantly increasing though the WHO recommended the optimal rate of cesarean section to be between 5 and 15%. [2] Worldwide, about 21.1% of women gave birth by cesarean Sect. [3] In Ethiopia, the prevalence of cesarean section among women who gave birth at health institutions was 29.55%. [4] Repeated cesarean section is associated with increased maternal complications, such as placenta previa, hysterectomy, adhesions, blood transfusions, and surgical injury. [5] Furthermore, the risk of postpartum death is higher in mothers who gave birth by cesarean Sect. [6,7]

Repeat CS is the most significant factor contributing to overall increased CS rates. The primary indication of repeat CS is a prior CS. [8] The trial of labor after cesarean (TOLAC) is an attempt to reduce CS rates. Several national medical associations have provided practice guidelines for vaginal birth after cesarean section (VBAC) [9,10], but these differ across countries. [11] Generally speaking, VBAC is relatively safe when compared with repeat CS. [12] However, TOLAC rates have dropped significantly worldwide in recent years. [13,14] For women with a prior cesarean delivery, a trial of labor will often represent her last opportunity to experience a normal birth. However, a failed VBAC increases the risk of maternal and perinatal complications more than an elective repeat CS. [15]

Studies have shown that women with one previous CS who undergo IOL have lower success rates of vaginal delivery compared with those who presented in spontaneous labor. [16] Women who had a previous successful VBAC have the best chance to deliver vaginally with success rate of 85%–90%. [17] Other prognostic variables include

maternal age <40 years, ethnicity, body mass index (BMI) <30, gestational age <40 weeks, infant birth weight <4 kg, and higher admission bishop score. [18,19] Success rate of VBAC correlates with the indication of the previous CS; CS for fetal malpresentation had higher success rate (84%) compared with CS for either labor dystocia (64%) or fetal distress (73%). [20]

The aim of the present study was to analyse the vaginal birth with previous caesarean section and its outcome.

Materials and Methods

The prospective controlled clinical study was Department of Obstetrics and Gynecology, ICARE Institute of medical sciences and Research & Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India over a 1-year period. The criteria for selection of women to undergo trail of VBAC in this hospital are similar to the American Congress of Obstetricians and Gynecologists (ACOG) guidelines. [21] However, induction of labour using prostaglandins is totally avoided and oxytocin for augmentation of labour is occasionally given in small doses and under careful observation.

For this study, we selected women who had only one previous caesarean section and were considered candidates for trail of VBAC. We further selected the women to include only those who were at term (defined as 37 completed weeks up to 40 weeks), determined by the last menstrual period and/or first trimester ultrasonography, and who had spontaneous onset of labour (defined as cervical dilatation of > 4 cm, with regular uterine contractions of 3+ per 10 min lasting 40 s or more). Those who did not have spontaneous onset of labour, did not reach term or had other obstetric or medical indications for caesarean section were excluded from the study. There were no post-date pregnancies noted in this study.

During the study period there were 150 women who had undergone previous caesarean section. Out of them, 100 women (66.66%) fulfilled our criteria and were included in the study. A control group (n = 100) was matched from women without previous caesarean section. They were matched for age, parity, gestational age, birth weight, Apgar score, use of oxytocin and mode of delivery. 5 cases in the control group developed intrapartum fetal distress and were restored to the operating theatre for abdominal delivery, leaving 100 control women who completed the study. Informed consent for participation in the study was taken from each participant and hospital ethical committee clearance was obtained.

Data Collection

Every participant received a thorough history, clinical and obstetric examination. The data retrieved included: maternal age, parity, gestational age, indications for previous caesarean section, circumstances surrounding the previous delivery, type of uterine incision, interval since the previous caesarean and previous vaginal delivery before or after the caesarean section. We always assess pelvic adequacy using digital pelvimetry.

During the trial of labour, the senior physician responsible for the labour room was informed about the case. An intravenous line was established and maintained and intravenous infusion of 5% dextrose in water was given. At least 1 unit of blood was typed and cross-matched for each woman. For those women in both groups who presented early in the first stage (cervical dilatation > 4 but < 7 cm) the partogram was established and the fetal and maternal conditions were assessed and plotted regularly. For the other women, fetal cardiac activity, maternal vital signs and uterine contractions were assessed every 30 min in the first stage and 15 min in the second stage. The uterine scar was assessed every 30 min by noting maternal tachycardia, scar tenderness, fetal tachycardia, haematuria, vaginal bleeding and loss of the presenting part on vaginal examination. The progress of labour was assessed by abdominal and/or vaginal examination 4 hourly in the first stage and more frequently in the second stage or when membranes were ruptured or bleeding ensued. This monitoring was continued throughout the trial of labour. Our policy to augment women with oxytocin during VBAC attempt is to infuse oxytocin 2.5 units in 500 mL of dextrose (or normal saline) at 10 drops/min (2.5 mIU/min) and increase the infusion rate by 10 drops/min every 30 min until a good uterine contractions pattern is established. All the women in our study responded to the first dose without further increment. All women had cardiotocography monitoring. Pain relief was given on the form of intramuscular injection of tramadol hydrochloride. Epidural analgesia was not available. The outcome measures were the duration of first and second stage of labour, intrapartum complications, Apgar score, birth weight, postpartum haemorrhage, uterine separation, need for blood transfusion and length of hospital stay.

Statistical Analysis

Data were analysed using Stata, version 10. The data were presented as mean and standard deviation (SD) and percentages when appropriate. Differences in means were tested by Student t-test. Chi-squared tests were used to compare frequencies. Fisher exact test was used when appropriate. Statistical significance was taken as P value < 0.05.

Results

Table 1: Maternal characteristics and outcome measures for the case group of women with trial of vaginal birth after caesarean section and the control group

Variable	Case group (n = 100)		Control group (n = 100)		P-value
	Mean	SD	Mean	SD	
Age (years)	23.7	5.5	24.6	8.4	0.755
Parity	2.8	1.0	2.8	1.2	0.314
Gestational age (weeks)	38.4	3.1	38.7	0.5	0.590
	No.	%	No.	%	
Oxytocin					< 0.001
No	92	92	46	46	
Yes	8	8	54	54	
Birth weight (g)					0.935
≤ 2500	22	22	18	18	
> 2500–3500	76	76	77	77	
> 3500	2	2	5	5	
Apgar score					0.945
< 6	5	5	5	5	
6–8	51	51	50	50	
> 8	44	44	45	45	
Postpartum complications					0.713
Dehiscence	2	2	0	0.0	
Uterine rupture	1	1	0	0.0	
Blood transfusion	1	1	0	0.0	
Length of hospital stay (hours)					0.856
2	90	90	96	96	
> 2–4	6	6	0	0.0	
> 4	4	4	4	4	

There were no significant differences between the study group and control group in terms of age, parity, gestational age or obstetric and medical history. Oxytocin was used to augment labour in 8 cases (8%) but there was no uterine rupture recorded in these cases. Overall there were 2 cases (2%) of uterine dehiscence and 1 case (1%) of uterine rupture among the VBAC group. There were no maternal deaths and only 1 stillbirth after the case of uterine rupture. There was no significant difference between the groups in Apgar scores; 5% of neonates in the VBAC trial group had Apgar score < 6 compared with 5% in the control group (P > 0.05). We found 2 neonates (2%) weighed > 3500 g but < 4000 g in the case group.

Table 2: Duration of first and second stages of labour for the case group of women with trial of vaginal birth after caesarean section and the control group

Stage of labour		Case group (n = 100)		Control group (n = 100)	P-value
	No.	Mean (SD) duration (min)	No.	Mean (SD) duration (min)	
1st stage	75	144.4 (72.8)	78	145.5 (67.3)	0.960
2nd stage	25	32.8 (6.4)	22	28.8 (7.3)	

Of the women who successfully delivered vaginally, 75 (75%) were admitted during the first stage of labour and 25 women (25%) in the second stage versus 78 (78%) and 22 (22%) respectively in the control group.

Discussion

Although efforts were made to reduce the number of CS, it failed to achieve the 15% rate recommended by the World Health Organization (WHO). [22] Repeat CS is the most significant factor contributing to overall increased CS rates. [23] The trial of labor after cesarean (TOLAC) is an attempt to reduce CS rates. Several national medical associations have provided practice guidelines for vaginal birth after cesarean section (VBAC) [24,25] but these differ across countries. [26] Generally speaking, VBAC is relatively safe when compared with repeat CS. [27] However, TOLAC rates have dropped significantly

worldwide in recent years. [28,29] The success rate of VBAC trial was 80%. It is comparable to other similar studies. Flamm et al. demonstrated that patients presenting with dilation ≥ 4 cm had an 86% success rate of VBAC. [30,31] Although a high success rates indicates a better maternal outcome32, these rates often apply to a selected population [33] and the overall outcome measures should include certain other delivery-related perinatal complications, such as hypoxic ischaemic encephalopathy.

There were no significant differences between the study group and control group in terms of age, parity, gestational age or obstetric and medical history. Oxytocin was used to augment labour in 8 cases (8%) but there was no uterine rupture recorded in these cases. Overall there were 2 cases (2%) of uterine dehiscence and 1 case (1%) of uterine rupture among the VBAC group. There were no maternal deaths and only 1 stillbirth after the case of uterine rupture. There was no significant difference between the groups in Apgar scores; 5% of neonates in the VBAC trial group had Apgar score < 6 compared with 5% in the control group (P > 0.05). We found 2 neonates (2%) weighed > 3500 g but < 4000 g in the case group. There were no maternal deaths and only 1 stillbirth after the case of uterine rupture. Uterine rupture rarely occurs in unscarred uterus (may occur in neglected prolonged labors). In western societies, rupture of uterus may occur in women undergoing VBAC. A study done in the Netherland showed that the use of PGE2, for induction or augmentation of labor with low bishop score, increased the risk of uterine rupture. [34] One study, including 20,059 women (done in the USA) who had one previous CS, found a rate of uterine rupture of 0.52% for spontaneous labor, 0.77% for induced labor with cervical catheter, and 2.22% for PG induction. Secondary analysis of the study showed that proper selection of women most likely to give birth vaginally and avoiding sequential use of multiple doses of PG and oxytocin are the best ways to avoid uterine rupture. [35]

However, the incidence is higher when the previous incision is classical, when there has been more one previous caesarean section, with induction of labour or with shorter interpregnancy intervals.[21] Of the women who successfully delivered vaginally, 75 (75%) were admitted during the first stage of labour and 25 women (25%) in the second stage versus 78 (78%) and 22 (22%) respectively in the control group. This finding shows that the estimation of fetal weight at term is relatively inaccurate whether done clinically or radiologically. Moreover, since the exact birth weight is only known after the delivery has occurred, this could limit the usefulness of birth weight as a predictor in clinical decision-making. Thus, birth weight may only be helpful when other predictors collectively are taken into consideration. Nevertheless, it implies that a women with one prior caesarean section and estimated fetal weight of > 3500 g but < 4000 g can be strongly encouraged to undergo VBAC attempt. [35]

Conclusion

On the basis of these results, we conclude that for selected cases with one prior lower segment caesarean section who present in spontaneous active labour, a trial of vaginal delivery may have a high success rate with no increased risk of maternal and fetal morbidity or mortality. The duration of labour for these women was similar to normal deliveries. Our findings may encourage obstetricians to tolerate VBAC and raise the threshold for recommending caesarean section if low-risk patients are carefully selected.

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