



## Study of Vaginal Birth after Caesarean Section

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### ABSTRACT

**Objective:** To determine the success rate and safety of vaginal delivery after previous one caesarean section (VBAC)

**Methods:** The Cross sectional study was done in 100 cases of  $G_2P_{1+0+0+1}$  with previous one caesarean section for trial of labour to determine the success rate and safety of vaginal delivery after previous one caesarean section (VBAC) in the Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal. Data for the purpose of my study was collected over a period of 18 months i.e. from November 2013 to April 2015. Data analysis was checked for consistency and accuracy using IBM SPSS ver. 16 and were described using means and percentages.

**Results:** During the study period, only 100 numbers of cases were eligible to undergo trial of labour. Of these 20 patients opted out from the study, 61 patients delivered vaginally and remaining 19 cases had failed trial of labour and had to undergo repeat caesarean section (CS). Out of total 19(23.8%) cases that underwent caesarean section, maximum study cases presented with scar tenderness 10(52.7%). followed by foetal distress in 6(31.6%) cases. VBAC success rate at our institution during our study period was 76.2% which is in tandem with other studies from different author's/scholars.

**Keywords:** Trial of labour, uterine rupture, vaginal birth after caesarean section trial of labor elective repeat caesarean section uterine rupture.

### INTRODUCTION

Caesarean delivery is an operation done to deliver a baby through an incision in the uterus. It is the most frequently performed surgical procedure worldwide and common surgical intervention to save the lives of the mothers and/ or the newborns<sup>1</sup>. The rate of caesarean section has increased dramatically world-wide over the past three decades.

In August 2010 ACOG issued a new Practice Bulletin, Vaginal Birth After Previous Caesarean

(VBAC) Delivery, which states that attempting a VBAC is a safe and appropriate choice for most women who have had a prior caesarean delivery, including for some women who have had two previous caesareans.<sup>2,3</sup>

A 60 to 80% success rate of vaginal birth after previous caesarean section has been reported by many authors if the primary caesarean was done for non-recurring indications.<sup>4</sup> Even though there is a risk of uterine rupture or scar rupture- in an appropriate clinical setting and properly selected

group of women, VBAC offers distinct advantages over a repeat caesarean section, since the operative risks are completely eliminated, the hospital stay is much shorter and expenses involved are much less. Trial of labour after previous caesarean delivery provides women who desire a vaginal delivery with the possibility of achieving that goal- a VBAC.<sup>5</sup>

A Cross sectional study was done in 100 cases of G<sub>2</sub>P<sub>1+0+0+1</sub> with previous one caesarean section for trial of labour and to determine the success rate and safety of vaginal delivery after previous one caesarean section (VBAC) in the Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal. Data for the purpose of my study was collected over a period of 18 months i.e. from November 2013 to April 2015. Pregnancy cases having history of previous one caesarean section and cases scheduled for delivery during study period were included in the **Inclusion criteria** with **Exclusion criteria** being Pregnancy cases with history of more than one caesarean sections and refusal to participate in the study. **Data analysis** was done for consistency and accuracy using IBM SPSS ver. 16 and data were described using means and percentages.

## RESULTS AND OBSERVATIONS

During the study period there were a total of 18,181 deliveries with 963 cases of G<sub>2</sub>P<sub>1+0+0+1</sub> with previous one caesarean section. 642 previous one caesarean cases were for the recurrent indications and 321 previous one caesarean cases was for non-recurrent indications. After screening of 321 cases with the exclusion criteria and counseling them to undergoing trial of labour to achieve a vaginal birth after caesarean section (VBAC), only 100 numbers of cases were eligible to undergo trial of labour. Of these 20 patients opted out from the study, 61 patients delivered vaginally and remaining 19 cases had failed trial of labour and had to undergo repeat caesarean section (CS). The indications for repeat CS was mostly for scar tenderness, fetal distress and non-progress of labor, etc.

Majority of the respondents were from the age group 26-30 years which accounted for 45% of cases. Mean age was 28.09 years with standard deviation of 4.6 years. Majority of the respondents had their last child born 2-3 years back which accounted for 42.5% of cases followed by 3-4 years as shown in table 1.

**Table 1:** Distribution of respondents by last child birth

LAST CHILD BIRTH	Number	Percentage
<2	13	16.2
2-3	34	42.5
3-4	24	30.0
4-5	6	7.5
5-6	3	3.8
Total	80	100.0

**Table 2:** Distribution of respondents by indication of past C/S

INDICATION FOR PAST C/S	Number	Percentage
Breech	29	36.2
Failed induction	18	22.5
Fetal distress	17	21.2
Placenta previa	7	8.8
Others	6	7.5
Big baby	3	3.8
Total	80	100.0

The commonest cause for previous C/S was mal-presentation (breech) which accounted for 36% of cases followed by failed induction and fetal distress as shown in table 2.

**Table 3:** Distribution of respondents by gestational age

GESTATIONAL AGE	Number	Percentage
37WKS-38WKS 6DAYS	41	51.2
39WKS-39WKS 6DAYS	27	33.8
40WKS & ABOVE	12	15.0
Total	80	100.0

Half of the respondents had period of gestation 37 weeks to 38 weeks and 6 days as shown in table 3.

**Table 4:** Distribution of respondents by inter delivery interval

INTER DELIVERY INTERVAL	Number	Percentage
<2 YRS	13	16.3
2-3 YRS	34	42.5
>3YRS	33	41.2
Total	80	100.0

Inter delivery interval was more than 2 years in most of the respondents (80%) as shown in table 4.

**Table 5:** Distribution of respondents by onset of labour

ONSET OF LABOUR	Number	Percentage
SPONTANEOUS WITH >4 CM CERVICAL DILATATION	80	100.0

All of the respondents had spontaneous labour with >4cm cervical dilatation (i.e. active labour) as shown in table 5.

**Table 6:** Distribution of respondents by mode of delivery

MODE OF DELIVERY	Number	Percentage
NVD+RMLE	13	16.2
VENTOUSE+RMLE	48	60.0
REPEAT CAESAREAN	19	23.8
Total	80	100.0

Majority of the respondents delivered by Ventouse (60.0%) with right medio-lateral episiotomy (RMLE) followed by repeat caesarean (23.8%) and normal vaginal delivery with RMLE (16.2%) as shown in table 6.

**Table 7:** Distribution of respondents by trial of labour outcome

TRIAL OF LABOUR OUTCOME	Number	Percentage
SUCCESSFUL VBAC	61	76.2
REPEAT C/S	19	23.8
Total	80	100.0

Majority (76.2%) had a successful VBAC and 23.8 % had repeat C/S as shown in table 7.

**Table 8:** Distribution of respondents by birth weight

BIRTH WEIGHT GROUP (IN KG)	Number	Percentage
<2.5	1	1.2
2.5-2.7	21	26.2
2.7-2.9	18	22.5
3.0-3.4	30	37.5
3.5-3.7	7	8.8
3.8-4.0	3	3.8
Total	80	100.0
Mean $\pm$ SD	3.09 $\pm$ 0.36	

One third of the respondent's baby weight 3.0 to 3.4 kg and Mean weight was 3.09 kg with a standard deviation of 0.36 Kgs as shown in table 8.

**Table 9:** Distribution of respondents by indication of repeat Caesarean section

INDICATION FOR REPEAT C/S	Number	Percentage
FETAL DISTRESS	6	31.6
NON PROGRESS OF LOBOUR	3	15.7
SCAR TENDERNESS	10	52.7
Total	19	100.0

Indication of present C/S was mostly due to scar tenderness in more than half of the cases followed by fetal distress (31.6%) and non- progress of labour (15.5%) as shown in table 9.

**Table 10:** Distribution of respondents by indication of repeat Caesarean section

INDICATION FOR REPEAT C/S	Number	Percentage
FETAL DISTRESS	6	31.6
NON PROGRESS OF LOBOUR	3	15.7
SCAR TENDERNESS	10	52.7
Total	19	100.0

Indication of present C/S was mostly due to scar tenderness in more than half of the cases followed by fetal distress (31.6%) and non- progress of labour (15.5%) as shown in table 10.

**Table 11:** Distribution of respondents by maternal outcome in VBAC

MATERNAL OUTCOME VBAC	Number	Percentage
No	61	100.0
Total	61	100.0

No maternal complication occurred in VBAC as shown in table 11.

**Table 12:** Distribution of respondents by maternal outcome in repeat C/S

MATERNAL COMPLICATION REPEAT C/S	Number	Percentage
PPH	1	5.3
PLACENTAL COMPLICATION	1	5.3
NIL	17	89.4
TOTAL	19	100.0

A single case of PPH and a single case of placental complication occurred in repeat C/S cases as shown in table 12.

**Table 13:** Distribution of respondents by hospital stay

HOSPITAL STAY	Vaginal delivery	Caesarean	Number	Percentage
<48HRS	61	0	61	76.2
5 DAYS	0	19	19	23.8
TOTAL	61	18	80	100.0

All delivered by VBAC stayed for less than 48 hours and all repeat caesareans stayed for 5 days as shown in table 13.

**Table 14:** Distribution of respondents by booked status

TYPE OF ADMISSION	Number	Percentage
UNBOOKED	46	57.5
BOOKED	34	42.5
TOTAL	80	100.0

In terms of antenatal visits, 34 out of 80 (42.5 %) cases were booked whereas 46 (57.5%) were unbooked cases as shown in table 14.

## Discussion

In the recent years, there has been a growing trend for Vaginal Birth after Caesarean Section (VBAC) and in appropriately selected women with previous one caesarean section is seen to be liberalised into practice. This has to be done without compromising the maternal and foetal safety margins to deliver either vaginally or repeat caesarean section following trial of labour. The main objective of this study was to evaluate the safety and success rate of attempted VBAC with a view to decrease the currently rising rate of caesarean section.

Regional Institute of Medical Sciences is one of the top ranked referral centres of Manipur where disproportionate mixtures of complicated and uncomplicated case are dealt with on a daily basis. This results in data variability on either side which has also been seen to fluctuate from the national and international scale of research and studies.

## Incidence of Vaginal birth after previous caesarean section

Studies in this area have been conducted owing to the importance of VBAC after previous caesarean section and researchers have reported the percentage of vaginal birth after previous caesarean section as follows:

Goel SS<sup>5</sup> et al in 2013 reported the VBAC success rate of 60.78 %, Dhawal V<sup>6</sup> et al in 2003 had 64 %, Puri P<sup>7</sup> et al in 2011 had 56.1% (VBAC), Nigam A et al in 2015 had 46% of successful VBAC, Jintukar AA et al in 2014 had 46.70% successful VBAC. Lieberman E<sup>8</sup> et al in 2004 and Bangal VB<sup>9</sup> et al in 2013 reported higher rates of 87% and 85% cases of successful VBAC respectively. In our study, we report a VBAC success rate of 76.2 %.

Balachandran L et al<sup>10</sup> cited 87% success rate of VBAC, Tongsong T and Jitawong C<sup>11</sup> shows the success rate of VBAC after trial of labour was 54.4%.

The patient's choice on the mode of delivery is the most important single factor in offering trial of labour. Women's expectations for birth and mode

of birth preferences are influenced not only by knowledge of the potential benefits and risks but also demographic, obstetrical and social factors. This knowledge would help while counselling expecting mothers for VBAC.<sup>12</sup>

## Antenatal care

Patients who attend the antenatal clinics of RIMS Hospital, Imphal for at least three antenatal visits in three trimesters are considered to be booked patients. 42.5% of the patients who underwent VBAC were booked while 57.5% of the patients were unbooked. Immunization for tetanus was seen in all the patients, both booked and unbooked. In our study it was seen that successful VBAC outcome was more in unbooked cases as most of them were admitted in the second stage of labour with more than 6 cm cervical dilatation.

## Age

Majority of the respondents were from the age group 26-30 years which accounted for 45% of cases. Mean age was 28.09 years with standard deviation of 4.6 years. A comparative study of the groups of women does not reveal a significant influence of age on the outcome of pregnancy.

In present day scenario, pregnancy after the age of 35 years has become quite prevalent and improved obstetrical care has made maternal age compatible with successful pregnancy for such women, especially in the absence of any pre-existing medical or obstetrical disorders.

## Timing of admission into hospital

The study found that 57.5 % of the cases who had VBAC were admitted to the hospital during labour on emergency basis whereas in patients who had to undergo repeat emergency CS due to failed trial of labour, 40% were admitted on emergency basis and 60% were admitted on routine basis. Unbooked patients who came in active labour could be convinced to undergo trial of labour. But booked patients who had been admitted on routine basis refused to undergo trial of labour despite counselling regarding VBAC. Even if they agreed



and gave their consent, in most of the cases they wanted to abandon trial of labour and opt for repeat CS due to extreme labour pain and fear of Scar rupture.

### **Duration of Inter-delivery interval**

Majority of the respondents had their last child born 2-3 years back which accounted for 42.5% of cases followed by 3-4 years. Contraceptives may have been used for spacing. And those with longer inter-delivery interval tend to have higher incidence of repeat CS.

### **Indication for previous caesarean section**

Maximum numbers of patients had previous caesarean section for breech presentation of which 36.2 % delivered vaginally. If the pelvis and baby weight seems proportionately adequate for trial of labour after previous one CS it can be safely given even if the indication for prior CS was for cephalo-pelvic disproportion (CPD). But patients must be properly assessed in subsequent pregnancies to rule out whether CPD exist or not. Proper selection of cases for trial of labour including clinical examination of these patients, induction or augmentation in selected cases with proper monitoring of labour may bring about a good number of vaginal deliveries in the cases where the previous CS was done even for CPD. A non- recurrent indication for previous CS such as breech presentation or foetal distress is associated with high successful VBAC rate than recurrent indication such as cephalo-pelvic disproportion. Birara M, Gebrehiwot Y et al<sup>13</sup> has also cited that the indications for the last caesarean sections were fetal distress, malpresentations, big baby, failed induction and CPD. Dadhwal V et al cited fetal distress, non progress of labour (NPOL) and breech presentation as the most common indications for caesarean sections.

### **Mode of delivery**

The probable reason for a higher success rate of trial of labour seen in western countries may be due to the fact that the cases were properly

screened. As well as with the use of sophisticated biophysical and biomedical gadgets in developed countries even the slightest deviation from normalcy in fetomaternal wellbeing can be managed accordingly.

### **Instrumental delivery**

The incidence of ventouse delivery among VBAC patients in the present study was 60% against 16.2% among normal delivery patients. The commonest indication for ventouse was to cut short the second stage of labour and to avoid unnecessary strain on the scar and thereby attempting to decrease the incidence of scar rupture. Forceps was not applied routinely in the present study. Current obstetrical practice, indication for forceps in post caesarean pregnancy cases are limited and are the same as in any other pregnancy. Hassan A et al<sup>14</sup> cited that out of 244 patients selected, 165 (67.2%) had a successful uncomplicated vaginal delivery, 7 (3.2%) were delivered by forceps, 11 (5.2%) with vacuum extractor.

### **Role of induction or augmentation of labour**

Oxytocin was selectively used in all the 76.2 % cases undergoing VBAC as most cases had spontaneous onset of labour with bishop score of > 6 used for augmentation of labour. It can be inferred from this that after proper screening and selection, oxytocin can be safely used in post caesarean cases under proper supervision. Dadhwal V et al cited that the use of oxytocin and indication of previous caesarean did not affect the success rate of vaginal birth after caesarean. Hassan A et al shows 83% of the patients had a spontaneous onset of labour and 17% needed induction of labour with prostaglandin E2 pessaries and augmentation of labour with oxytocin. Chua S et al<sup>15</sup> cited that of 75 patients who received oxytocin for augmentation and 22 for induction of labour, 70.5% achieved vaginal delivery which was similar to the vaginal delivery rate in patients who did not require augmentation / induction. Lai SF and Sidek S<sup>16</sup> shows that more

vaginal deliveries ( $p < 0.05$ ) were achieved when oxytocic infusion was used in selected cases during the Trial of labour. Weinstein D et al<sup>17</sup> concluded that there was no contraindication to either oxytocin or prostaglandin to induce labour after one previous caesarean delivery and its judicious use with careful foetal and maternal monitoring seems to be safe.

### **Routine Exploration of Scar**

Routine exploration of the scar after vaginal delivery was not done in this study. But the issues of digital exploration are still debateable issues. Holland and Brews advocate routine exploration of scar after placental expulsion in vaginal delivery. But as per Williamson's Obstetrics many investigators do not advocate routine digital exploration of scar in hemodynamically stable patients for the fear of causing iatrogenic rupture of scar.

### **Cervical dilatation at the time of previous caesarean section and present outcome of labour**

In this study, only few patients were able to produce their discharge certificates or allied documents regarding their previous CS. Due to which, the extent of cervical dilatation or stage at which previous CS was done could not be revealed in majority of cases. But during the present study period 100% of cases were seen to be in spontaneous onset of labour with cervical dilatation of more than 4 cm which is one of the most important factors for successful VBAC outcome.

Malede B and Yirgu G et al<sup>18</sup> in their study states that the strongest factor determining success in this study was cervical dilatation at admission. Those who were admitted with cervical diameter greater than 3 cm (Active first stage of labour) had a strong likelihood of vaginal delivery than those admitted at cervical diameter of less than or equal to 3 cm (latent first stage of labour). Puri P et al found the most important predictor of successful VBAC to be a favourable bishop score. Out of 21

patients (10.24%), with a Bishop Score of 7 on admission 17 (80.95%) had successful VBAC.

### **Rupture of scar**

In this study, no routine exploration of scar or uterus was done following vaginal delivery and placental expulsion in hemodynamically stable patients. No scar dehiscence was noticed in those patients who had successful VBAC. There was no associated neonatal or maternal morbidity and mortality as 19 cases underwent repeat CS due to scar tenderness but no scar dehiscence was noticed during operation. This shows that only scar tenderness does not give the final diagnostic point of scar rupture but it is an important sign which is not to be missed in a patient with previous caesarean section. Landon MB et al<sup>19</sup> studied a multivariable analysis which showed no significant difference in the rates of uterine rupture in VBAC with two or more previous caesarean births compared with a single previous caesarean birth. Pembe AB et al<sup>20</sup> in their study had an incidence of uterine rupture of 2%. Dodd JM et al<sup>17</sup> showed the success of vaginal birth after caesarean section was 69%, with a 2.1% risk of uterine rupture. Puri P et al<sup>21</sup> says there was no maternal or neonatal mortality and also no case of uterine rupture which is consistent with our study.

### **Maternal morbidity and mortality**

In this study maternal mortality is zero and maternal morbidity after VBAC is definitely low in comparison to repeat caesarean section. The VBAC group showed no complication as compared to the repeat CS group where there were 5.3% of postpartum haemorrhage and 5.3% of placental complications like adherent placenta. The normal delivery group of patients did not show any postpartum haemorrhage. The maternal morbidity was reflected by the numbers of days of hospital admission. It was  $< 48$  hrs in VBAC cases and 5 days in cases of repeat caesarean section. The mean length of hospital stay was similar to the findings of Tan PC et al<sup>22</sup> who found that increase rate of VBAC is accompanied

by a tendency towards an overall decrease in the maternal length of hospital stay. Lovell R et al<sup>23</sup> states that patients who delivered vaginally spent significantly less time in hospital.

### Birth weight

In our study one third of the respondents' baby weight 3.0 to 3.4 kg as with Mean weight of 3.09 kg with a standard deviation of 0.36 years, which is a favourable outcome in favour of successful VBAC.

Zelop et al<sup>24</sup> compared the outcomes at term of a trial of labour in women with previous caesarean section who delivered neonates weighing >4 kg versus women with those weighing <4 kg. Of 2749 women, 13% had infants with birth weights > 4kg. Caesarean delivery rate associated with birth weights <4 kg was 29% versus 40% for those with birth weights >4 kg. These results are comparable to our study.

Anwar S et al<sup>25</sup> cited that the mean gestation was 38(37 to 41 weeks). Out of 100 parturient, 59% had birth weight 2.5-3 Kg while 25% had 3.1-3.5 Kg and only 16% had birth weight 3.6-4 Kg. The overall success rate for vaginal delivery after previous caesarean was highest for Group of 2.5 to 3kgs, and lowest for Group of 3.6 to 4 kg, suggesting a strong correlation of birth weight with success of vaginal birth after caesarean section.

### CONCLUSION

During the study period, only 100 numbers of cases were eligible to undergo trial of labour. Of these 20 patients opted out from the study, 61 patients delivered vaginally and remaining 19 cases had failed trial of labour and had to undergo repeat caesarean section (CS). Out of total 19(23.8%) cases that underwent caesarean section, maximum study cases presented with scar tenderness 10(52.7%). followed by foetal distress in 6(31.6%) cases. VBAC success rate at our institution during our study period was 76.2% which is in tandem with other studies from different author's/scholars.

Each practicing obstetricians should take utmost responsibility and work towards improvement of the operative procedure to make caesarean section simpler, safer and more efficient. There is a need for through study and research to outline the best management option of the post caesarean pregnancies and make an effort to decrease the overall increasing rate of caesarean sections.

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