e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(11); 530-541

Original Research Article

A Comparative Study between Outcome of Vaginal Birth after Caesarean Section (VBAC) and Planned Repeat Caesarean Delivery (PRCD)

Subhasini[1], Priyanka Gahlout[2], Chanchal[3]

[1]Senior Resident, Department of Obstetrics and Gynaecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

[2]Senior Resident, Department of Obstetrics and Gynaecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

[3]Associate Professor and Head of Unit, Department of Obstetrics and Gynaecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

Received: 29-09-2022 / Revised: 30-10-2022 / Accepted: 15-11-2022

Corresponding author: Dr Priyanka Gahlout

Conflict of interest: Nil

Abstract

Background: Post-Caesarean pregnancy has become one of the commonest indications for Caesarean section in multipara. As CS rates in primigravida rise, these patients form a load for the future obstetrician who has to manage their next pregnancies with repeat sections. But we must remember that many post-Caesarean patients can be safely delivered vaginally, thus helping to reduce CS rates and avoiding complications of repeat Caesarean section. This study was planned to assess advantages and complications of VBAC in comparison to PRCD in managing post-caesarean pregnancy.

Methods: Present study was conducted at Obstetrics and Gynaecology Department of Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar from May 2022 to October 2022. All admitted patients taking proper history of previous caesarean section, clinical assessment, use of PARTOGRAM, USG for 'Feto-Placental Profile', Colour Doppler study and CTG. Antenatal mothers booked at antenatal clinics. After proper counselling cases were divided in 2 groups- in one group VBAC attempts (TOL) was undertaken and in the second group PRCD were done.

Results: Of the 40 mothers who underwent TOL in our study, 25 delivered vaginally; this gave a very good rate of success (62.5%). This is comparable to the ranges of VBAC success of 55 to 85% mentioned in most literature. No patient in my study require Oxytocin augmentation for successful VBAC, which is also consistent with findings in literature. Study of mode of delivery was the next objective and showed that most patients who underwent VBAC had vaginal delivery with episiotomy (92%) in our centre for post-Caesarean mothers.

Conclusion: VBAC was significantly more beneficial to the patient than PRCD with respect to shorter duration of hospital stay and early return to normal activities and breast feeding, with no increased risk of morbidity to mother or baby. VBAC is thus a safe and attractive alternative to PRCD as mode of delivery of the post-Caesarean mother.

Keywords: VBAC, PRCD, Multipara, PARTOGRAM, CTG

Introduction

Previously there was a dictum by Dr. E. B. Cragin "once a caesarean always a caesarean". But due to low risk of scar rupture in low transverse caesarean section, more women are encouraged to undergo spontaneous labor and vaginal delivery after caesarean. So, vaginal delivery after Caesarean is very much possible without much increased risk to mother or foetus. Trial of labour after previous caesarean delivery (TOLAC) provides women who desire a vaginal delivery the possibility of achieving the goal of—a vaginal birth after caesarean delivery (VBAC). In addition to fulfilling a patient's preference for vaginal delivery, at an individual level VBAC is associated with decreased maternal morbidity and a decreased risk of complications in future pregnancies. At a population level, VBAC also is associated with a decrease in the overall caesarean delivery rate. Although TOLAC is appropriate for many women with a history of a caesarean delivery, several factors increase the likelihood of a failed trial of labour, which compared with VBAC, is associated with increased maternal and perinatal morbidity. Assessment of individual risks and the likelihood of VBAC is, therefore, important in determining who are appropriate candidates for TOLAC.

Thus, conducting labour in a post-Caesarean patient offers obstetric challenge.

Evidence confirming the safety of VBAC within proper guidelines has been available for more than 10 years.

VBAC results in avoidance of another surgery, less blood loss, less hospital stay, less financial burden for both patients and hospital, less surgical complications like injury to bladder or gut and wound infection. It also results in quick recovery enabling the mother to take care of her baby much earlier, including breast feeding. The baby also has less respiratory problems and incidences of Transient Tachypnoea of Newborn (TTN), Respiratory Distress Syndrome (RDS), Pulmonary hypertension and asthma are much less than in babies delivered by repeat CS.

However, there is a definite risk of scar rupture when conducting a VBAC, which is said to be 0.5-1%. In PRCD group, there is no chance of true scar rupture. Moreover, in cases of failed trial of labour (TOL) followed by emergency CS, chances of complications like wound infection, scar rupture/dehiscence and maternal morbidity as a whole is increased to a great extent of about 14.1%. So selection of cases for undertaking trial of labour is very crucial and should follow recommendations such as those offered by the ACOG. Other minor complications associated with VBAC, like perineal pain due to stitch infection, chances of transitory stress incontinence and subsequent genital prolapse, are similar to other vaginal deliveries.

Thus PRCD, though decreasing the chances of serious complications like uterine scar rupture or dehiscence, increases financial burden and delayed recovery to normal activities and for child caring. Moreover, repeat Caesarean Section may cause 2.7-fold increased risk of placenta praevia or morbidly adherent placenta in future pregnancy as well as increased chances of early pregnancy loss and subfertility. In addition, the beneficial effects of VBAC on the foetus are also considerable.

Material and Methods

This prospective study was conducted at Department of Obstetrics and Gynaecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar from May 2022 to October 2022. All antenatal mothers booked at antenatal clinics. After proper counselling cases were divided in 2 groups- in one group VBAC attempts (TOL) were undertaken and in the second group PRCD were done. VBAC

attempts, again, divided into successful and failed VBAC groups according to success in the VBAC attempts. All booked post-caesarean pregnancy at term with history of one prior LSCS with non-recurring indication, spontaneous onset of labour in VBAC was awaited. If no spontaneous onset of labour occurs by 41 weeks, repeat caesarean section was performed were included in this study. The unbooked cases, previous classical, inverted T, or, low vertical shaped uterine incision, or, any history of uterine scar (following Myomectomy, hysterotomy), estimated foetal weight >3.5kg, malpresentation like breech, transverse lie, history of post-op wound infection following previous LSCS likr associated anaemia (Hb<10gm %), PIH, diabetes mellitus, heart disease, and renal disease, details of previous C.S. operation not available, contraindication to vaginal delivery like CPD, major degree of placenta previa and twin pregnancy were excluded.

A total of 80 mothers with previous caesarean section was allocated to either VBAC or, PRCD. Taking above written inclusion and exclusion criteria in consideration mothers were selected for allocation with proper consent. The sample size of 80 mothers, 40 in each study arm is meant to ensure an optimum number of participants to allow the study of benefits and drawbacks of the approach.

Women who met the above requirements were given a full description of the study and asked if they would like to participate.

Those who gave written informed consent were assigned to the chosen study regimen. Women who were unable to read the consent form had the form read to them in their native language. Those who did not wish to participate were given standard treatment and care.

Study technique included detail history taking and clinical examination. Relevant investigations were done. The patients were monitored for occurrence of any complications during antenatal, intranatal and post-natal period. The mode of delivery was noted, neonatal & maternal outcome had been noted.

Results and Analysis

Table 1

Age (In Years)	Tolac (N = 40)	Prcd (N = 40)
18 - 22	n = 16 (40%)	n = 15 (37.5%)
23 - 28	n = 22 (55%)	n = 23 (57.5%)
> 28	n = 2 (5%)	n = 2 (5%)

Chi-square = 0.54, df = 2, p = 0.973

In my study out of 40 TOLAC mothers, 16 mothers (40%) were in the age group of 18-22 years, 22 mothers (55%) were in the age group 23-28 years, rest 2 (5%) were of >28 years. Similarly in PRCD group out of 40 mothers, 15 mothers (37.5%) were in the age group of 18-22 years, 23 mothers (57.5%) were in the age group 23-28 years, rest 2 mothers (5%) were of >28 years. There is no statistically significant difference between the 2 groups.

Table 2

Religion	Tolac(N = 40)	Prcd(N = 40)
Hindu	N = 11 (27.5%)	N = 12 (30%)
Muslim	N = 29 (72.5%)	N = 28 (70%)

Chi-square = 0.61, df = 1, p = 0.805

In my study out of 40 TOLAC mothers, 29 (72.5%) were Muslims; rest 11 (27.5%) were Hindu. Similarly in PRCD group also Muslims dominated 28 out of 40 mothers (70%); 12 mothers (30%) belonged to Hindu. The 2 groups were thus similar in religious distribution. There is no statistically significant difference between the 2 groups.

Table 3: The following table shows percentage of successful VBAC with reference to indication of previous Caesarean Section:

Indication	Percentage
Breech	28% (7 Out Of 25mothers)
Pih	20% (5 Out Of 25mothers)
Prom	20% (5 Out Of 25mothers)
Foetal Distress	12% (3 Out Of 25mothers)
Aph	8% (2 Out Of 25mothers)
Eclampsia	4% (1 out of 25mothers)
Iugr	4% (1 out of 25mothers)
Failed Induction In Post-Dated Pregnancy	4% (1 out of 25mothers)
Grand Total	100%

Table 4: Following table shows percentage of indications of caesarean section in failed VBAC followed by emergency caesarean section:

Indication	Percentage
Non Progress Of Labour	46.67% (7 out of 15 mothers)
Prom	13.33% (2 out of 15 mothers)
Foetal Distress	13.33% (2 out of 15 mothers)
Pih	13.33% (2 out of 15 mothers)
Breech	13.33% (2 out of 15 mothers)

Table 5: Following table shows the indication of previous caesarean section in PRCD group.

Indications	Percentage
Cpd	25% (10 out of 40 mothers)
Foetal Distress	15% (6 out of 40 mothers)
Aph	12.5% (5 out of 40 mothers)
Eclampsia	12.5% (5 out of 40 mothers)
Failed Induction Due To Inadequate Contraction	10% (4 out of 40 mothers)
Boh	10% (4 out of 40 mothers)
Iugr	5% (2 out of 40 mothers)
Pih	5% (2 out of 40 mothers)
Prom	5% (2 out of 40 mothers)
Grand Total	100%

Table 6:

Successful Vbac (N = 29)	Nd + Epi.	Forceps
No. & percentage (%)	N = 23 (92%)	N = 2 (8%)

Out of 25 successful VBAC, only 2 mothers delivered by *assisted vaginal delivery* to cut short the second stage and 23 mothers (92%) delivered vaginally with Episiotomy (ND EPI).

Table 7:

Pulse	Successful Vbac (N=25)	Prcd (N=40)	Failedvbac (N=15)
80-100 bpm	n = 22 (88%)	n = 35 (87.5%)	n = 9 (60%)
>100 bpm	n = 3 (12%)	n = 5 (12.5%)	n = 6 (40%)

The table shows most (80-90%) of the mothers in each group, successful VBAC (22 out of 25 mothers), PRCD (35 out of 40 others) or failed VBAC (9 out of 15 mothers) , had intra-natal pulse within 80-100 bpm. Failed VBAC group had no statistically significant increase in intra natal pulse rate when compared to either successful VBAC (p=0.503), or PRCD (p=0.628).

Table 8:

Bp	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N=15)
< 140/90	n = 20 (80%)	n = 30 (75%)	n = 10 (66.67%)
≥140/90	n = 5 (20%)	n = 10 (25%)	n = 5 (33.33%)

Out of 40 mothers who had PRCD, 30 mothers (75%) had blood pressure <140/90 and the rest 10 mothers (25%) had blood pressure ≥140/90. In failed VBAC group 5 mothers (33.33%) had BP ≥ 140/90 and rest 10 mothers (66.67%) had BP < 140/90. In successful VBAC group 5 mothers (20%) had BP ≥140/90. Failed VBAC group had no statistically significant difference in intra natal Blood Pressure when compared to either successful VBAC (p=0.082), or PRCD (p=0.878).

Table 9:

Pulse	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N=15)
80-100 BPM	n = 20 (80%)	n = 23 (57.5%)	n = 9 (60%)
≥ 100 BPM	n = 5 (20%)	n = 17 (42.5%)	n = 6 (40%)

Post-natally there were 5 (20%) mothers having pulse ≥ 100 bpm in successful VBAC group, while rest 20 mothers (80%) had pulse 80-100 bpm. In PRCD group 23 mothers (57.5%) had pulse 80-100 bpm and rest 17 mothers (42.5%) had pulse ≥ 100 bpm. There were 9 mothers (60%) had pulse 80 -100 bpm, while rest 6 mothers (40%) had pulse ≥100 bpm failed VBAC group. Failed VBAC group had no statistically significant increase in post-natal pulse rate when compared to either successful VBAC (p=0.306), or PRCD (p=0.714).

Table 10:

Bp	Successful Vbac (N= 25)	Prcd (N= 40)	Failed Vbac (N= 15)
< 140/90	n = 21 (84%)	n = 33 (82.5%)	n = 8 (63.33%)
≥140/90	n = 4 (16%)	n = 7 (17.5%)	n = 7 (36.67%)

In this study in the successful VBAC group, post-natally 21 mothers (84%) had BP < 140/90 , and 4 mothers (16%) had BP ≥140/90 and 7 mothers (17.5%) in PRCD group had BP ≥ 140/90 & rest 33 mothers (82.5%) had BP <140/90. But, in failed VBAC group 7 mothers (36.67%) had BP ≥ 140/90 and rest 8 mothers (63.33%) had BP < 140/90. Failed VBAC group had no statistically significant difference in post-natal Blood Pressure when compared to either successful VBAC (p=0.053),or PRCD (p=0.177).

Table 11

Pph	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N= 15)
Present (%)	n = 2 (8%)	n = 4 (10%)	n = 6 (40%)
Absent (%)	n = 23 (92%)	n= 36 (90%)	n = 9 (60%)

Out of 25 successful VBAC & PRCD, there was PPH in only 8% (2 out of 25 mothers) and 10 %(4 out of 40 mothers) cases respectively; whereas incidence of PPH in failed VBAC group was 40% (6 out of 15 mothers). This represents statistically significant increase in post-partum haemorrhage in the failed VBAC group when compared to both successful VBAC (p=0.02) and PRCD (p=0.033). The PRCD group showed a slightly higher incidence of PPH compared to successful VBAC group (10% vs 8%), but the difference was not statistically significant.

Table 12

Need For Blood Transfusion	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N=15)
Needed	n = 1 (4 %)	n = 2 (5 %)	n = 2 (13.33%)
Not needed	n = 24 (96 %)	n = 38 (95 %)	n = 13 (86.67%)

In successful VBAC group 1 mothers (4%) needed blood transfusion and rest 24 mothers (96%) did not need. In PRCD group 2 mothers (5%) needed blood transfusion, while rest 38 mothers (95%) did not need. In failed VBAC group blood transfusion needed in 13.33% (2 out of 11 mothers). Failed VBAC had no statistically significant increase in the need for blood transfusion when compared to either successful VBAC (p=0.813), or PRCD (p=0.609).

Table 13

Febrile Episode	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N=15)
Fever (%)	n = 2 (8%)	n = 8 (20%)	n = 7 (46.67%)
No fever (%)	n = 23 (92%)	n = 32 (80%)	n = 6 (53.33%)

In my study, incidence of febrile episodes was highest in failed VBAC group 7 out of 15 mothers (46.67%) followed by PRCD group- 8 out of 40 mothers (20%) and least in successful VBAC group-2 out of 25 mothers (8%). Rests were afebrile. Failed VBAC group had statistically significant increase in the febrile episode when compared to successful VBAC group (p=0.004). Though failed VBAC group had slightly higher rate of febrile episode compared to PRCD (46.67% vs 20%), there is no statistically significant difference between (p=0.086).

Table 14

Wound Infection	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N= 15)
Infected (%)	n = 1 (4%)	n = 5 (12.5%)	n = 5 (33.33%)
Non-infected (%)	n=24 (96%)	n = 35 (87.5%)	n = 10 (66.67%)

Study revealed that incidence of wound infection was highest in failed VBAC group- 5 out of 15 mothers (33.33%) followed by PRCD group- 5 out of 40 mothers (12.5%) and least in successful VBAC group 1 out of 24 mothers (4%). Here either infected abdominal wound, or episiotomy wound with or without gaping was taken into account. Failed VBAC group had no statistically significant difference in the incidence of wound infection when compared to either successful VBAC group (p=0.24),or PRCD group (p=0.23). Though the differences have no statistical significance, incidence of wound infection is quite high in failed VBAC group compared to either successful VBAC or, PRCD.

Table 15:

Neonatal Morbidity	Successful Vbac (N=25)	Prcd (N=40)	Failed Vbac (N=15)
Nil	n = 24 (96%)	n = 38 (95%)	n= 11 (66.67%)
Birth asphyxia	n = 1 (4%)	n = 2 (5%)	n = 1 (6.67%)
Convulsion	nil	nil	nil
Meconium aspiration	nil	nil	n = 1 (6.67%)
Hypoglycemia	nil	nil	nil
Nicu admission	n = 1 (4%)	n = 2 (5%)	n = 2 (13.34%)

Out of 25 successful VBAC there was 1 (4%) case of birth asphyxia; whereas 2 (5%) incidences were reported in PRCD group. Although in failed VBAC group as many as 6.67% babies had birth asphyxia these group had no statistically significant difference in the incidence of birth asphyxia when compared to either successful VBAC (p=0.464),or PRCD (p=0.609).

Out of 25 successful VBAC deliveries, 1 baby (4%) needed to admit in NICU. In PRCD group 5% were admitted in NICU. Although in failed VBAC as many as 13.34% needed admission in NICU these group had no statistically significant difference in the incidence of NICU admission when compared to either successful VBAC (p=0.114),or PRCD (p=0.149).

Table 16

Group	Mean	Standard Deviation
Successful vbac (n=25)	1.96 days	0.498
Prcd (n=40)	5.35 days	0.533
Failed vbac (n=15)	5.7 days	0.78

Mean duration of hospital stay in successful VBAC group is 1.96 ± 0.498 days. In PRCD group mean hospital stay duration is 5.35 ± 0.533 days. In failed VBAC group this duration is 5.7 ± 0.78 days. Two-tailed test showed that the means of successful VBAC and failed VBAC are significantly different at $p < 0.05$, but the means of PRCD and failed VBAC are not significantly different.

Still birth:

Fortunately no still birth reported in this study.

Scar dehiscence:

There was 1 incidence of scar dehiscence in PRCD group, and there are 2 incidence of scar dehiscence in *failed VBAC* group.

Caesarean hysterectomy:

Very fortunately, there was no incidence of caesarean hysterectomy in this study.

Table 17

Vbac	Percentage
Successful	62.5% (25 out of 40)
Failed	37.5% (15 out of 40)

Trial of Labour (TOL) was attempted in 40 post-Caesarean mothers, of whom 25 mothers successfully delivered vaginally. So, rate of successful VBAC in my study was *62.5%.*

Discussion

My study was of 80 post-Caesarean patients among whom 40 underwent Trial of Labour and 40 underwent PRCD. Sixteen maternal and three foetal parameters were studied to compare the outcome.

In my study out of 40 TOLAC mothers, 16 (40%) were in the age group of 18-22 years, 22 (55%) were in the age group 23-28 years, rest 2 (5%) were of >28 years. [Table – 1] Similarly in PRCD group out of 40 mothers, 15 (37.5%) were in the age group of 18-22 years, 23 (57.5%) were in the age group 23-28 years, rest 2 (5%) were of >28 years. In my study both TOLAC & PRCD had similar age distribution, there was no statistically significant difference between the 2 groups(p=0.973). Though maternal age > 40 years is associated with an increased rate of failure of TOL in post-Caesarean patients [1], increasing maternal age when below 40 years, which was the age group of the patients in my study, has not been shown to significantly affect TOL success rate and this was also the finding of my study.

In my study muslims dominated in both groups. In TOLAC group 72.5% of patients were muslims, similarly in PRCD group 70% were muslims. [Table – 2]There is no statistically significant difference between the 2 groups (p = 0.805).

Indications for previous Caesarean section, whether recurrent or non-recurrent cause influence the outcome of subsequent trial of labour.(2) The patients who had successful VBAC in my study mostly had previous section due to malpresentation (28%), premature rupture of membranes with unfavourable cervix (20%), pregnancy induced hypertension (20%) and foetal distress (12%).[Table – 3]

Those who failed trial of labour and had to undergo emergency CS mostly had previous section for non-progress of labour (46.67%), followed by other non-recurrent causes like foetal distress, PROM, PIH. [Table – 4] Thus in patients in whom labour had failed to progress normally in previous delivery, subsequent trial in post-Caesarean pregnancy was also found to be a failure. Flamm *et al* also noted lower rates of success of trial of labour in post-Caesarean patients in whom prior section was done for non-progress of labour [1]. It may be assumed that in many cases the failure to progress in previous labour was due to borderline CPD. Other studies have also found that when CPD is the indication for previous section, being a recurrent cause, subsequent TOL in the post-Caesarean pregnancy is likely to fail [3].

In my study, 25% of the mothers who had planned repeat Caesarean delivery had previous CS due to CPD, a recurrent indication for which we withheld TOL in these patients. [Table – 5]

Considering the additional risk of uterine rupture when labour in post-Caesarean mothers was augmented with Oxytocin [4,5] no patients in my study did not receive Oxytocin augmentation.

Most patients who delivered vaginally, were delivered with episiotomy. Most patients (92%) were delivered after giving episiotomy. [Table - 6] Similar to my study the study by Butt *et al* showed that 62.38% of successful VBAC did not require instrumentation, while 38 (37.62%) needed assistance of whom 25 (24.75%) by vaccum and rest 13 (12.87%) by forceps.[3]

More than 88% of the mothers in both groups (TOLAC and PRCD) had intra-natal pulse rate between 80-100 bpm. [Table – 7] Failed VBAC had no statistically significant increase in intra natal pulse rate when

compared to either successful VBAC(p=0.503), or PRCD(p=0.628).

Out of 40 mothers who had PRCD, 30 mothers (75%) had intra-natal blood pressure <140/90 and the rest 10 mothers (25%) had blood pressure ≥140/90. [Table – 8] In failed VBAC group 5 mothers (33.33%) had BP ≥ 140/90 and rest 10 mothers (66.67%) had BP < 140/90. In successful VBAC group 5 mothers had BP ≥140/90 and 20 had BP < 140/90. Failed VBAC had no statistically significant difference in intra natal blood pressure when compared to either successful VBAC(p=0.082),or PRCD(p=0.878).

Post-natally there were 5 (20%) mothers having pulse ≥100 bpm in successful VBAC group, while rest 20 mothers (80%) had pulse 80-100 bpm. [Table – 9] In PRCD group 23 mothers (57.5%) had pulse 80-100 bpm and rest 17 mothers (42.5%) had pulse ≥ 100 bpm. There were 9 mothers (60%) had pulse 80 -100 bpm, while rest 6 mothers (40%) had pulse ≥100 bpm failed VBAC group. Failed VBAC had no statistically significant increase in post-natal pulse rate when compared to either successful VBAC (p=0.306),or PRCD (p=0.714).

In this study in the successful VBAC group, post-natally 21 (84%) mothers had BP < 140/90, and 4 (16%) had BP ≥ 140/90 and 7 mothers (17.5%) in PRCD group had BP ≥ 140/90 & rest 33 mothers (82.5%) had BP < 140/90. But, in failed VBAC group 7 mothers (36.67%) had BP ≥ 140/90 and rest 8 mothers (63.33%) had BP < 140/90. [Table – 10] Failed VBAC had no statistically significant difference in intra natal Blood Pressure when compared to either successful VBAC (p=0.053),or PRCD (p=0.177).

One of the most dreaded complications of any childbirth is post-partum haemorrhage. [Table – 11] In my study, out of 25 mothers who had successful VBAC, there was PPH in only 8%. On the other hand, 10% mothers who underwent PRCD had PPH and as many as 40% of those who had emergency CS due to failed TOL suffered from this complication. This represents statistically significant increase in post-partum haemorrhage in the failed VBAC group when compared to both successful VBAC (p=0.020) and PRCD (p=0.033). The PRCD group showed a slightly higher incidence of PPH compared to successful VBAC group (10% vs 8%), but the difference was not statistically significant. This is in contrast to most studies, which show a similar rate of blood loss >1000cc in all patients who undergo repeat CS delivery, whether elective (PRCD) or emergency (failed VBAC). The rate of PPH was also found to be 4-fold higher in the failed TOL group compared with those who delivered successfully by vaginal route.

Though the rates of haemorrhage were significantly higher in the failed VBAC group in my study, difference in the incidence of blood transfusion did not reach statistical significance. [Table – 12] In successful VBAC group, only 4% needed blood transfusion; in the PRCD group 5% needed blood transfusion, and in failed VBAC group 13.33% needed blood transfusion. Failed VBAC had no statistically significant increase in the need for blood transfusion when compared to either successful VBAC (p=0.813), or PRCD (p=0.609). My study is similar to the study by Hibbard *et al* which failed to show a significant difference in rates of blood transfusion between VBAC, PRCD and failed TOL groups.[6,7] However, Yeh *et al* have found an increased requirement of blood transfusion in patients who underwent repeat Caesarean section, whether elective or emergency.[8] Guise Study report that the difference in pooled incidences of transfusion among women who had TOLAC (0.9%) and women who had ERCD (1.2%) was not statistically significant [7].

Among other parameters of maternal morbidity, febrile episodes were commonest in failed VBAC group (46.67%) followed by

PRCD (20%) and least in successful VBAC (8%) in my study. [Table – 13] Failed VBAC had statistically significant increase in the febrile episode when compared to successful VBAC. (p=0.004) Though failed VBAC group had slightly higher rate of febrile episode compared to PRCD (45.45% vs 20%), there is no statistically significant difference between. (p=0.086)

Durnwald *et al* have also found that patients who failed TOL had more significantly more episodes of amnionitis, post- partum febrile episodes (11.2% vs 2.4%; p value=0.0003) and endometritis than patients who underwent PRCD [9]. Infectious morbidity including chorio-amnionitis & endometritis and consequently post-natal febrile episodes was also markedly higher in failed VBAC group compared to successful VBAC & PRCD in the study by Hibbard *et al*. [6] The aforementioned study showed a 17.1% incidence of febrile episodes in patients who failed TOL, which was significantly higher than the 3.8% incidence of fever in patients who delivered vaginally.

In my study, wound infection occurred in 33.33% of patients who failed TOL, 12.5% of those who had PRCD and was only in 4% of those who had successful VBAC. [Table – 14] Failed VBAC had no statistically significant difference in the incidence of wound infection when compared to either successful VBAC, (p=0.24) or PRCD. (p=0.23) Though the differences have no statistical significance, incidence of wound infection is quite high in failed VBAC group compared to either successful VBAC or, PRCD. The Chicago VBAC review however found a higher incidence of maternal infections in PRCD group (59 per 1000) compared to those who attempted VBAC (43 per 1000).(11) According to study by McMohan *et al* rate of wound infection in TOLAC group was 1.3% (3.3% in failed VBAC , nil in successful VBAC), and 2.2% in PRCD group. [10]

Foetal outcome was an important focus of comparison between attempted VBAC and PRCD in my study. [Table – 15] The first parameter studied was the incidence of neonatal morbidity. In infants delivered by successful VBAC there was 4% incidence of birth asphyxia; whereas 5% incidence was noted in babies born by PRCD. This is in contrast to most studies which note an increase in non-asphyxial morbidity in infants delivered by VBAC. Although in failed VBAC as many as 6.67% babies had birth asphyxia these group had no statistically significant difference in the incidence of birth asphyxia when compared to either successful VBAC, (p=0.464) or PRCD. (p=0.609) The Chicago review noted a higher incidence of infant morbidity due to infection when mothers attempted VBAC (5%) compared to PRCD (2%), but other non-asphyxial morbidity in the form of infant breathing problems was higher (4.1% vs 1.3%) among infants of mothers who had PRCD than among those who underwent TOL [11].

Out of 25 successful VBAC deliveries, only 1 baby needed admission in NICU. In babies delivered by PRCD 2 out of 40 (5%) were admitted in NICU. Although in failed VBAC as many as 13.34% needed admission in NICU these group had no statistically significant difference in the incidence of NICU admission when compared to either successful VBAC, (p=0.114) or PRCD. (p=0.149) Durnwald *et al* also found that babies delivered by emergency CS following failed TOL did NOT show a higher incidence of NICU admission, ventilation, intra-ventricular haemorrhage or seizures [9].

One of the principal benefits of VBAC is the shorter duration of hospital stay [10-14]. [Table – 16] In my study too, mean duration of hospital stay in successful VBAC group was only 1.96 ± 0.498 days, significantly shorter than patients who failed TOL ($p<0.05$). Mean hospital stay was similar in the mothers who underwent PRCD 5.35 ± 0.533 days and in failed VBAC group 5.7 ±

0.78 days. Although mean duration of hospital stay in PRCD group was less than failed VBAC group, this difference did not reach statistical significance ($p<0.05$). Hibbard *et al* also noted a short mean hospital stay of 2.3 days in patients who had successful VBAC, compared to 5.4 days in those who failed TOL and 5 days in those who had elective CS [6].

Fortunately there was no stillborn noted in this study. Guise study reported significantly increase in rate of perinatal mortality in TOLAC group (0.13%) compared to PRCD (0.05%).

Among the women who underwent emergency CS, 7 out of 15 had poor labour progress, 2 had foetal distress and 4 had scar tenderness.

However, there was 2 cases of scar dehiscence noted in this study among the 40 women who attempted TOLAC and there was 1 case of scar dehiscence noted in this study among the 40 women who underwent PRCD. There were no cases of uterine rupture.

Very fortunately, there was no incidence of caesarean hysterectomy in this study. Guise study reported that there was no statistically significant difference in the rate of caesarean hysterectomy between the groups [7]

Of the 40 mothers who underwent TOL in my study, 25 delivered vaginally; this gave a success rate of 62.5%. This is comparable to the ranges of VBAC success of 55 to 85% mentioned in the Cochrane review [15]. [Table – 17]

Conclusion

The poorer outcome of failed VBAC also emphasises the need for following proper guidelines not only in case selection but also in monitoring labour, ensuring availability of skilled anaesthetist and paediatrician during emergency and the need for proper counselling of the mothers willing to undergo trial of labour in post-Caesarean pregnancy. The limitation in my study is the small sample size.

References

1. Flamm BL, Geiger AM. VBAC delivery: An admission scoring system. Obstet Gynecol Dec 1997; 90(6): 907-10.
2. Eglinton GS. Effect of previous indication for Caesarean on subsequent outcome. In: Phelan JP, Clark SL eds, Caesarean Delivery. New York NY: Elsevier 1988: 476-83.
3. Butt T, Akhtar S. Vaginal birth after previous one Caesarean section: term pregnancy outcome. J Postgraduate Med Institute 2005; 19(2): 175-81.
4. Goetzl L, Shipp TA, Cohen A, Zelop CM, Repke JT, Lieberman E Oxytocin dose and the risk of uterine rupture in trial of labor after Cesarean. Obstet Gynecol 2001; 97:381–4.
5. Ravasia DJ, Wood SL, Pollard JK. Uterine rupture during induced trial of labor among women with previous Cesarean delivery. Am J Obstet Gynecol 2000; 183:1176–9.
6. Hibbard JU, Ismail MA, Wang Y, Te C, Karrison T, Ismail MA. Failed Vaginal Birth After Caesarean Section: How risky is it? Am J Obstet Gynecol 2001; 184: 1365-95.
7. Guise JM, Eden K, Emeis C, et al. Vaginal birth after cesarean: new insights. Evidence Report/Technology Assessment No. 191 (Prepared by the Oregon Health & Science University Evidence-based Practice Center under contract no. 290-2008-10057-I). AHRQ Publication No. 10-E003. Rockville (MD): Agency for Healthcare Research and Quality; 2010.
8. Yeh S, Huang X, Phelan JP. Post-term pregnancy after previous Caesarean section. J Reprod Med 1984 Jan; 29(1): 41-4.
9. Durnwald C, Mercer B. Vaginal birth after Cesarean delivery: predicting

success, risks of failure. J Matern Fetal Neonatal Med.2004 Jun; 15(6): 388-93.
10. McMahon MJ, Luther ER, Bowes Jr WA, Olshan AF. Comparison of a trial of labor with an elective second cesarean section. N Engl J Med 1996;335(10):689–695.
11. Landon MB, Hauth JC, Leveno KJ, et al. Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. N Engl J Med 2004;351(25):2581–2589.
12. Obstetric myths vs Research realities by Henei Goer; 23.
13. A guide to effective care in pregnancy and childbirth. 3rd edn. Enkin M, Keirse MJNC, Nelson J, et al.; 362.
14. AIMS Occasional paper "Risks of Caesarean Section" Research paper, pg 2.
15. Dodd JM, Crowther CA, Huertas E, Guise JM, Horey D. Planned elective repeat caesarean section versus planned vaginal birth. Cochrane Database of Systematic Reviews. 2004;4.