

Study of Obstetric and Fetal Outcome of Post Caesarean Section Pregnancy at Tertiary Care Center

Anagha A. Jinturkar^{1*}, Dipti Dongaonkar²

{¹Assistant Professor, ²Dean and Professor}

Department of Obstetrics and Gynaecology, Government Medical College, Latur, Maharashtra, INDIA.

* Corresponding Address:

dranagha37@gmail.com

Research Article

Abstract: Background: With the sky rocketing caesarean section rates an increasing number of women face the issue of mode of delivery in their current pregnancy. There are conflicting reports regarding the safety of a trial for vaginal birth after caesarean delivery (VBAC) in terms of uterine rupture, maternal and perinatal morbidity. The purpose of this study was to evaluate the obstetric and fetal outcomes of patients presenting at term with a history of one previous LSCS. **Methods:** A six months prospective, observational study was conducted where all patients who had a term pregnancy with a history of previous one LSCS in between were included after obtaining their consent for participation. The obstetric and fetal outcomes of these patients in the present pregnancy were noted and tabulated. A descriptive analysis of these outcomes was carried out. **Results:** 320 Patients at term, with a history of previous one LSCS were studied. Of these, trial for a VBAC was attempted by 182 patients and 46.70% had a successful VBAC. 138 patients underwent an elective repeat caesarean delivery. 65.62% of the patients who had a history of previous vaginal delivery (s) had a successful VBAC. Out of 18 patients who were induced with PGE2 gel, only 22.22% delivered vaginally. Scar dehiscence was seen in 2.72% of the patients who opted for a trial for VBAC. Perinatal morbidity was higher in cases of repeat caesarean delivery than in those who had a successful VBAC (12.12% Vs 0 percent). Maternal complications were also higher in patients who had a repeat LSCS compared to those who had a successful VBAC (12.76% Vs 2.74%). **Conclusion:** With an increase in the proportion of patients with a history of previous LSCS, it is essential for health care institutions to have proper antenatal counseling regarding VBAC and a well defined management protocol in an effort to increase the number of VBACs and bring down the overall caesarean rates. Patients with a history of prior vaginal delivery have an increased likelihood for a successful VBAC. A successful VBAC is associated with a lower perinatal and maternal morbidity than repeat caesarean delivery. This is relevant for counseling women about their choices after a caesarean delivery.

Keywords: Previous LSCS; Post caesarean pregnancy; VBAC; Maternal outcomes; fetal outcomes.

Introduction

Incidence of primary caesarean section has increased multifold over the last 20years. As a result, an increasing number of women face the issue of mode of delivery in

their subsequent pregnancies.^{1,2,3} No randomized controlled trials have compared the results of routine repeat caesarean section with those of planned vaginal birth for women who have had a previous caesarean section and this may remain an unrealistic aspiration.⁶ In the absence of such trials, the best available data on the relative safety of a planned vaginal birth after caesarean come from observational prospective cohort studies. In these studies, in which the proportion of women who undertook a planned vaginal birth after previous caesarean varied from 20 to 80%, successful vaginal birth occurred in 67 to 84%, averaging about 80% of the women who made the attempt. In the series for which total data are available for both women who had elective caesareans and those who had a planned vaginal birth after caesarean section, well over half of all women with a previous caesarean gave birth vaginally.⁷ Cragin's dictum of "once a caesarean always a caesarean" contributed to a 30–50% rise in caesarean rates in the United States, till the 1980s.^{4, 5} The warning was given when the caesarean rate was under 2%, sections were usually done for severe cephalopelvic disproportion, and the classical (vertical) incision on the muscular body of the uterus was almost universally used, which is hardly proposed today. A series of studies in the 1980s reported the relative safety of attempting vaginal birth after caesarean delivery (VBAC). Maternal mortality and serious morbidity are fortunately very low. A large meta-analysis showed maternal mortality of 2.8 per 10000 for women undergoing planned VBAC, and 2.4 per 10 000 for women having an elective caesarean. Uterine dehiscence or ruptures occur in less than 2% of planned VBAC, the same proportion as is seen among women who have routine repeat caesareans. Most of these are asymptomatic and of no clinical importance. Perinatal mortality and morbidity rates were similar with planned vaginal birth after caesarean and elective repeat caesarean

section in these studies.⁸ The most important event because of which obstetricians still hesitate to attempt planned VBAC is the uterine scar integrity and hence the terminology “Trial of scar”. Because repeat caesarean deliveries are performed largely to benefit then neonate, clinicians may often overlook maternal complications resulting in significant morbidity and mortality as a result of the repeat surgeries.⁹ The choice of VBAC over planned repeat caesarean section, like virtually every other medical choice, involves the balancing of risks and benefits. One point is clear though, “once a caesarean, always a hospital delivery”.¹⁰ The purpose of this study was to evaluate the obstetric and fetal outcome of labour in cases of previous caesarean section in our teaching hospital.

Aims and Objectives

To study the obstetric and fetal outcome in present pregnancy of patients with a history of previous one caesarean section.

Factors studied were

1. Route of delivery.
2. Incidence of vaginal delivery following LSCS.
3. Incidence of scar dehiscence /scar rupture.
4. Maternal mortality and morbidity determined by any one or more of the following: haemorrhage, blood transfusion requirement, viscus injury, wound infection, endometritis, hysterectomy and thromboembolism.
5. Fetal outcome (as a consequence to intrapartum events): Admission to neonatal intensive care unit (including reason for admission), first and fifth minute Apgarscore, perinatal mortality.

Methodology

Study Design: Prospective, cohort, observational study

Source of Data: The study population consisted of patients with a history of previous one caesarean section, who delivered in the present pregnancy, at Govt. Medical College, Latur (Maharashtra) teaching institute and tertiary care centre between 01.07.2013 to 31.12.2013.

Sample Size: This study included 320 cases of previous one caesarean section who were registered at our hospital and who delivered in our hospital over a period of six months.

Inclusion Criteria

- All term patients looked at our centre with a history of previous one LSCS, age less than 35 years, height of patient more than 5 fts, with cephalic presentation. Pelvic adequacy confirmed.

Exclusion Criteria

Women with previous two or more LSCS, age more than 35 years placenta previa, systemic illness demanding

LSCS pt., referred from other hospital for delivery are excluded.

Method

Management protocol of Department of Obstetrics at Govt. Medical College, Latur (Maharashtra) for patients with a history of previous one LSCS was followed:

1. The high risk pregnant women were advised regular antenatal check up after confirmation of pregnancy.
2. A detailed following of past obstetric history was noted.
 - a) Indication and place of previous caesarean section.
 - b) History of any full term vaginal deliveries prior to or following previous caesarean.
 - c) History of complications encountered in previous section such as need for blood transfusion and complication like following the caesarean section viz., foul smelling lochia, high spiky fever, wound infection and systemic infection, requiring prolonged hospitalization.
3. A general physical examination and systemic examination was carried out.
4. Obstetric examination was done for fetal well being.
5. Scar tenderness was elicited on admission and at onset of labour.
6. Pelvic adequacy was reconfirmed checked for a trial for VBAC. The points assessed were sacral curve, whether sacral promontory was reached or not, sacrospinous notch, lateral pelvic walls, ischial spines and interspinous distance, subpubic angle, diagonal conjugate and transverse diameter of pelvic outlet.
7. Before an attempted VBAC all women willing for vaginal delivery, patients were informed the risks, benefits, potential complications and alternatives to a trial for a VBAC. Written consent to volunteer in trial was taken.
8. A single dose of PGE2 gel was used for ripening of cervix who did not spontaneously go into labour at 41 completed weeks and monitored for 6 hrs in active labour.
9. During labour
 - a) Blood was sent for cross matching and kept ready.
 - b) Intravenous line was established.
 - c) Mother was closely monitored during labour with regular checking of the vital parameters.
 - d) Scar tenderness was looked for.
 - e) Fetal heart rate was recorded half hourly by Doppler.
 - f) Cervical dilatation, effacement and station of the head were monitored for progress of labour. Also character, duration and frequency of uterine contractions were monitored.
 - g) Mother monitored for scar dehiscence such as

hypotension, tachycardia, abdominal tenderness, fetal heart rate alteration, Super ficialpalpation of fetal parts per abdomen.

- h) Intrapartum fetal monitoring was carried out with the help of cardio to cography Oxytocin was administered in 5 % D it was initiated rate of 0.5 to 1mu/min and increased till establishment of a satisfactory labour pattern, but not more than 2 mu/min.
- i) The “six hour rule” was observed by partograph recording in active labour, wherein planned VBAC was terminated after six hours of active labour, if vaginal delivery was not imminent or develops fetomaternal complication.

After Delivery

All patients were monitored ½ hourly. For 6 hrs following delivery. Subsequent complications and condition of the mother and baby till discharge from the hospital were studied. *All relevant patient details pertaining to the study were noted on the proforma (attached in annexure).* This prospective, observational study was done in our institution where facilities for emergency intervention, CCU, blood transfusion are available.

Table 1: Incidence of previous LSCS patients

Total No of deliveries from July 2013 to Dec. 2013	Total No. of Case with Previous caesarean Section at term	Incidence%
2243	320	14.24

The incidence of previous caesarean section cases is 14.27%

Table 2: Registered versus unregistered previous LSCS cases

Type	No. of Cases	Percentage (%)
Registered More than 3 visits	260	81.25
Unregistered One visit	60	18.75
Total	320	100

Patients with at least three visits to the ANC clinic were included in the registered category, rest were grouped as unregistered.

Table 3: Outcome of trial for VBAC

Outcome of trial of labour	No. of Cases	Percentage (%)
Successful VBAC	85	46.70
Unsuccessful VBAC	97	53.30
Total no. of patients who had atrial for VBAC	182	100

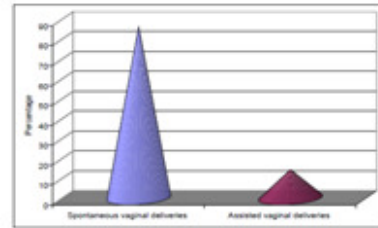
In the present study, VBAC was tried in 182 cases, of which 85 (46.70%)patients had a successful VBAC. 97 (53.30%) patients who were given a trial for VBAC were posted for an emergency LSCS for various indications. 138 patients refused to volunteer in VBAC trial and underwent elective LSCS.

Table 4: Mode of vaginal deliveries

Nature of vaginal deliveries	No. of case	Percentage (%)
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	(85)	
Spontaneous vaginal deliveries	73	85.88
Assisted vaginal deliveries	12	14.12
Forceps	5	
Ven to use	7	

Of the patients who had a successful VBAC, 73 (85.88%) delivered spontaneously and 12 (14.12%) had an assisted vaginal delivery.



Graph 1: Mode of vaginal deliveries

Table 5: Mode of delivery after induction by PGE2 gel in cases of patients with post datism

No. of induced cases	Mode of delivery Vaginal (%)	Repeat LSCS (%)
18	4(22.22)	14(77.78)

Out of the 18 patients, who were induced with PGE2 gel 4(22.22%) patients delivered vaginally and 14(77.78%) patients had an unsuccessful VBAC.

Table 6: Present outcome and history of previous vaginal deliveries

	No. of cases	Vaginal delivery	Repeat LSCS
History of previous vaginal deliveries	32	21(65.62%)	11(34.38%)
A. Prior Successful VBAC	10	8(80%)	2(20%)
B. No prior successful VBAC	22	13(59.09%)	9(40.90%)
No history of previous vaginal deliveries	150	64(42.66%)	86(57.33%)
Total	182	85	97

Above table shows that women with previous history of vaginal delivery have a better chance for a successful VBAC.

Table 7: Emergency Vs Elective LSCS

Nature of LSCS	No. of cases
Emergency CS (After VBAC)	97
Elective CS (No VBAC)	138
Total	235

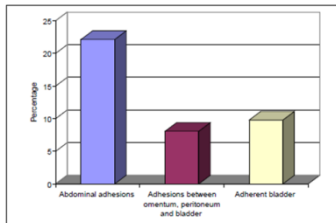
44.25% cases had an emergency LSCS and 55.74% cases were taken up for an elective LSCS, out of the repeat caesarean sections.

Table 9: Difficulties encountered during repeat caesarean section

Difficulties while doing repeat CS	No. of cases	%
Difficulties in opening the abdomen due to adhesions	52	22.12
Adhesions between omentum, peritoneum	19	8.08

and bladder		
Difficulty in separation of bladder	23	9.79

Repeat LSCS was done in 235 cases, of which difficulty in opening the abdomen due to adhesions was encountered in 52 (22.12%) of the patients. Adhesions between the omentum, peritoneum and bladder was seen in 19 (8.08%) of the patients. Difficulty in separation of the bladder in was seen in 23 (9.79%) of the patients.

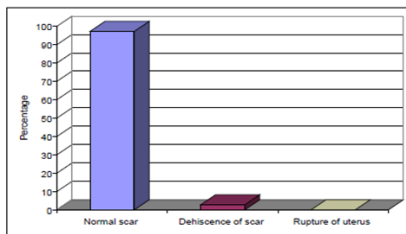


Graph 3: Difficulties encountered during repeat caesarean section

Table 10: Condition of uterine scar during repeat CS

Condition of Scar	No. of Cases	%
Normal scar	177	97.25
Dehiscence of scar	5	2.75
Rupture of uterus	0	0

Scar dehiscence was seen intra operatively during repeat CS in 5 patients of the 182 patients who had a trial for VBAC.



Graph 4: Condition of uterine scar during repeat CS

Table 11: Perinatal morbidity and mortality

	After BAC%	After repeat CS	%
1. Perinatal mortality	0	0	0
2. Admission to NICU	0	5	2.12
* Respiratory distress syndrome	0	4	-
* IUGR	0	1	-

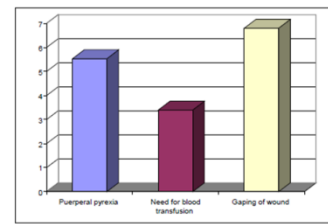
There was no perinatal mortality seen in the present study.

Table 12: Material Complications after repeat caesarean section

Sr. No.	Complications	No. of cases	%
1	Puerperal pyrexia	13	5.53
	A. UTI	6	2.55
	B. Wound infection	7	2.98
2	Need for blood transfusion	8	3.40
3	Gaping of wound	16	6.80

Out of 235 patients in whom repeat LSCS was performed 30 cases had complications, 13 patients had puerperal pyrexia, which was due to UTI (6) and wound infection

(7) 16 patients had gaping of the LSCS wound post operatively. Blood transfusion was required in 8 cases. Hospital stay ranged from 10-21 days.



Graph 5: Maternal complications after repeat caesarean section

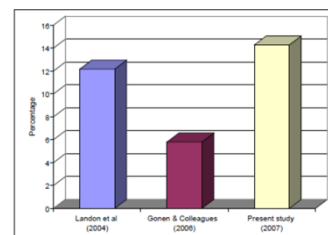
Table 13: Maternal complications after VBAC

Complications	No. of cases	%
Perineal tears	3	3.52
Cervical tear	2	2.35

Out of the 85 patients, who had a successful VBAC, 3.52% had perineal tear and 2.35% had a cervical tear. No other major complications were noted.

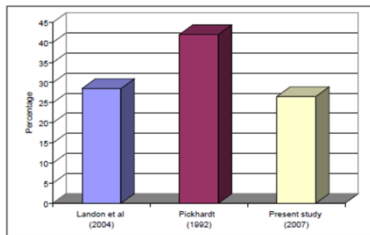
Discussion

There is a widespread public and professional concern about the increasing proportion of births by caesarean section world wide.³⁵ Increasing rates of primary caesarean section have led to an increased proportion of the obstetric population who has a history of prior caesarean delivery. Pregnant women with a previous caesarean were counseled a trial for VBAC. The percentage of women, who decline VBAC, is in turn, a significant determinant of overall rates of caesarean birth. New evidence is emerging to indicate that VBAC may not be as safe as originally thought.^{23, 36} but reports are conflicting and these factors along with medico legal concerns have led to a decline in clinician's attitude for offering VBAC and also women not accepting trial for VBAC in various parts of the world.^{5, 37} The present study evaluated the outcome and trends in patients with a history of prior LSCS who delivered in our hospital from 1st July 2013 to 31 Dec. 2013. Out of 2243 patients who delivered in our hospital during the study period, 320 term patients chosen for present study had a history of one previous LSCS, accounting for 14.27% of the total number of patients (Refer table 1). This incidence is comparable to the recent study by Landon *et al* (2004) who reported 12.16%.



Graph 7: Comparison of Incidence of Previous LSCS

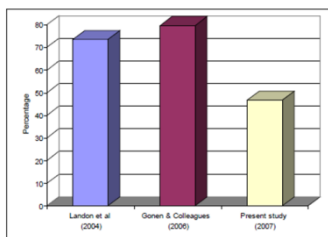
The overall rate of vaginal delivery following previous caesarean delivery, as reported in literature, varies from 28% to 51%. Landon *et al* reported an incidence of 28.57% vaginal deliveries.²³ Our study is comparable to this, with 26.56% of the patients delivering vaginally (**Table 3**). However, Gonen and colleagues (Nigerian study) in their study reported 51.22% of patients delivering vaginally. Chattopadhyay and colleagues reported an incidence of 40% and Pick hard reported an incidence of 42% (**Graph 16**)^{40,41} was part of health condition of women. Out of the 320 patients in our study, 56.87% were given a trial for VBAC (**Table 4**), as against 39.90% of the patients in the study by Landon *et al* and 64% of the patients in the study by Gonen and Colleagues.^{23, 25} 46.70% of patients had a successful VBAC in the present study, which is



Graph 8: Comparison of Incidence of Vaginal Delivery

Lower than that in other studies (**Table 4**). Landon and associates reported a success rate for vaginal delivery of 73.41% and Gonen *et al* reported a success rate of 79.66%.^{23,25} (**Graph 17**) Cowen and colleagues reported a successful VBAC of 81%.²¹ The probable reasons for a low rate of successful VBAC in our study were that :

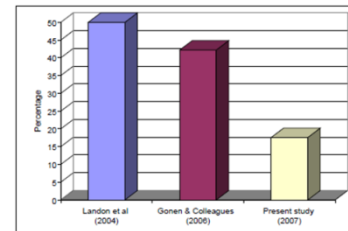
1. Only 17.58% of the patients of our study who opted for a trial for VBAC had a history of prior vaginal deliveries before or after as compared to 50% of the patients in the study by Landon and colleagues and 42.20% of the patients in the study by Gonen *et al*.^{23,25}
2. About 52.88% of the patients, who (2014) unsuccessful VBAC, were taken up for a repeat CS in view fetal distress, early in labour.



Graph 9: Comparison of Success of VBAC

Out of the 18 patients in the present study who completed 41 weeks of pregnancy were induced with PGE 2 gel only 22.22% delivered vaginally and 77.78% had a repeat CS (**Table 6**). There was no scar dehiscence or rupture seen

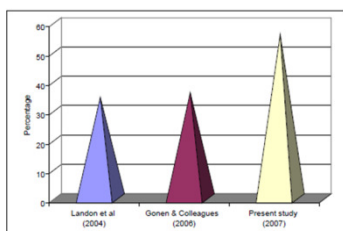
in any of the induced patients. Gonen *et al* reported that 68.33% of the patients, who were induced, delivered vaginally and there were no cases of uterine rupture following induction.²⁵ Landon *et al* on the other hand, reported a significantly greater risk of uterine rupture associated with induction of labour.²³ In the present study only 17.58% of the patients of given a trial for VBAC, had a history of prior vaginal deliveries, as against 50% of patients in the study by Landon *et al* and 42.20% of the patients with a similar history in the study by Gonen and colleagues (**Graph 18**).^{23,25} 65.62% of patients with a history of previous vaginal delivery delivered vaginally in the present pregnancy (**Table 7**). About 90% of the patients who had a history of previous vaginal delivery in the study by Gonen and Colleagues, had a successful VBAC (**Graph 10**).²⁵ Of the 32 patients in our study with a history of prior vaginal delivery, 10 patients had a history of prior successful VBAC and 80% of them delivered vaginally in the present pregnancy. This indicates that women with a previous vaginal delivery had a better chance for a successful VBAC, and the study by Landon *et al* also concluded that, women with a prior vaginal delivery or a prior successful VBAC were more likely to undergo a trial for VBAC in their present pregnancy with a good rate of success.²³



Graph 10: Comparison of Patients with history of Prior Vaginal Deliveries

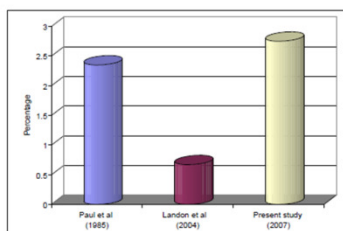
Mercer *et al* in a 4 year observational multi centre study concluded that an increasing number of prior successful VBACs is associated with a greater probability of VBAC success as well as a lower risk of uterine rupture and perinatal complications in the current pregnancy.⁴⁶ 55.74% of the patients who had a repeat CS in the present study, were taken up electively for various indications (**Table 8**). This was significantly higher than the percentage of women who had an ERCS in the Landon *et al* study, which was 34.40%, and 36% in the study by Gonen and colleagues (**Graph 20**).^{23,25} The most common indication for an ERCS (Elective Repeat caesarean Section) in the present study was the unwillingness of the patient for a VBAC in spite of being eligible for a trial for VBAC, which constituted 38.17% of the total number of patients who had an ERCS. This is comparable to the study by Gonen and colleagues, where 37.90% of the patients had an ERCS on maternal request and declined

for a trial for VBAC.²⁵ Scar dehiscence, defined as a disruption of the uterine muscle with in tactserosa, was seen in 5 patients (2.75%) who had a trial for VBAC in the present study (**Table 12**). This is comparable to the incidence quoted by Paul *et al*, which was 2.35% in their study.⁴⁷



Graph 11: Comparison of Patients who had a Repeat Elective CS

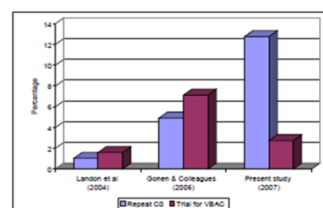
Landon and colleagues however reported an incidence of only 0.67% which is lower than that in the present study (**Graph 12**).²³ The reason for this may have been the large size of the Landon *et al* study and its multicenter design. There were no cases of uterine rupture in the present study. The main difficulties in the present study while doing a repeat caesarean section were, difficulty in opening the abdomen due to adhesions in 22.12% of the cases, adhesions between omentum, peritoneum and bladder in 8.08% of the cases and difficulty in separation of the bladder in 9.79% of the cases (**Table 9**). Parikh *et al* found excessive adhesions in 36% of the patients for an LSCS in his study.⁴⁸ These results are comparable to those in the study by Gonen and colleagues,



Graph 12: Comparison of Incidence of Scar Dehiscence

In the present study, maternal morbidity was noted in 12.76% of the patients who had a repeat CS and in only 2.74% of patients who had a trial for VBAC (**Tables 12 and 13**). Maternal morbidity in cases of repeat caesarean delivery was in terms of puerperal pyrexia (5.53%), need for blood transfusion (3.4%) and wound gaping (6.80%). Puerperal pyrexia was due to urinary tract infection (UTI) in 2.55% of the patients and LSCS wound infection in 2.98% of the patients who underwent repeat CS. Blood transfusion was required in 3.40% of the patients who had a repeat CS and the main indications were severe anemia and excessive bleeding during CS. LSCS wound gaping contributed to a significant proportion of maternal morbidity. It has generally been accepted that vaginal

delivery is associated with lower maternal morbidity and mortality rates than repeat CS. Our results are comparable to an earlier meta analysis comparing ERCS Vs trial for VBAC.⁴⁹ In the present study, there was no maternal mortality noted. In the United States, ERCS results in around half a billion dollars in cost to the tax payer every year. A review of literature suggests that it does not effect any decrease in fetal or maternal mortality and instead further increases costs borne out of increased hospital stay and maternal morbidity.^{50, 51} From various recent studies on the subject of birth after previous caesarean delivery, it would be safe to conclude that a trial for VBAC after a prior LSCS constitutes a safe form of obstetrical management.



Graph 13: Comparison of Maternal Complications

Current recommendations of the RCOG and ACOG include offering the option of a planned VBAC to women with a prior history of one un complicated LSCS in an otherwise uncomplicated pregnancy at term, with no contraindication to vaginal birth.^{34,52} Stress has been laid on proper antenatal counseling regarding the benefits and risks associated with a planned VBAC. A final decision for mode of birth must be agreed upon before the expected date of delivery (ideally at 36 weeks of gestation).⁵² VBAC should always be attempted in institutions well equipped to respond to emergencies, with an OT facility and adequate trained personnel to provide emergency care.³⁴ In the absence of large scale RCTs comparing trial for VBAC and ERCS, there is a large scope for future research in 'birth after previous caesarean birth' and priorities have to be identified in this respect. A simple and pragmatic method or scoring system for quantifying the risk of emergency caesarean delivery and uterine rupture during attempted VBAC will help identify women at high risk for an unsuccessful VBAC and would thus help decision making considerably. Long term maternal and infant outcomes between planned VBAC and ERCS, such as subfertility, depression, pelvic floor dysfunction, incontinence and neuro developmental disorders need to be studied.

Conclusion

1. A large number of patients previous LSCS declined a trial for VBAC in spite of being

eligible for it (Table no. 9). Hence, it is essential to counsel extensively by seniors, ideally during the antenatal period, regarding the benefits and the risks (both maternal and perinatal) of a VBAC, and assurance for emergency intervention if required

2. Patients with a history of previous vaginal delivery(s) and particularly those with a history of prior successful VBAC, have a better chance for a successful VBAC.
3. Majority of the patients with previous LSCS can be counseled and induced with PGE2 gel were delivered by an emergency LSCS, either in view of failure to go into labour or for fetal distress (Table no. 6), suggesting that the use of an inducing agent decreases the chance for a successful VBAC.
4. In cases of previous LSCS morbidity associated with scar dehiscence persist and hence vigilance by obstetrician and paramedical staff is needed.
5. In case of previous LSCS outcome of mode of delivery is associated with the level of experience of obstetrician and paramedical staff.

Summary

- A total of 320 patients with a history of previous LSCS, presenting at term, were studied over a period of six months.
- Amongst the 320 patients, 81% were registered with us prior to admission.
- All the patients were subjected to a clinical examination and were either given an option for a trial of VBAC or taken up for an elective repeat caesarean section depending on their informed choice.
- Out of 320 patients, 182 opted for a trial for VBAC. Out of the 182 patients who were given a trial for VBAC, 85 (46.70%) had a successful VBAC.
- Only 32 (17.58%) of the patients had a history of previous vaginal deliveries and about 66% of them had a successful VBAC in the present pregnancy. 138 patients were taken up for an elective repeat caesarean delivery, the most common indication being the unwillingness of the patient for a trial for VBAC (38.17%)
- 97 (53.30%) of the patients had a repeat caesarean section following failed trial for VBAC or fetal complication fetal distress.
- Out of the 18 patients who were induced with PGE2 gel, only 4 patients delivered vaginally, that is to say that every 1 in 5 patients (20%) a successful VBAC.

- Scar dehiscence was noted in 5(2.5%) patients who attempted a VBAC.
- Perinatal morbidity in terms of admission to the NICU for RDS (4 neonates) and IUGR (1 neonate) was 2.12% in the cases of repeat caesarean delivery and nil among those who had a successful VBAC.
- Complications such as puerperal pyrexia (13) due to UTI and wound infection, requirement for blood transfusion (8) and wound gaping (16) was noted.
- Complications such as perineal and cervical tears were seen in 5 cases after a trial for VBAC.

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