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Original Research Article

Maternal and perinatal outcomes of delivery after previous one or two cesarean section

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ABSTRACT

Introduction: The prevalence of cesarean deliveries is high in many parts of world. Vaginal birth after cesarean section (VBAC) is a trial of vaginal delivery in selected cases of a previous CS in a well equipped hospital. It 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.
Objectives: To study the maternal and perinatal outcomes among women with previous Cesarean section at a tertiary care centre.
Materials and Methods: This prospective study was carried out over a period of 12 months. 979 pregnant women with previous caesarean section were recruited in study. A detailed history was taken and mode of delivery decided as per the standard protocol. 636 patients underwent elective repeat LCSC.343 patients were given trial of labour out of which 226 delivered vaginally. Maternal and neonatal outcomes were noted
Result: The rate of successful VBAC was 65.89%. Most common indications of repeat caesarean section were fetal distress and failure to progress. Post op maternal and neonatal complications were significantly more in repeat caesarean section group. Incidence of infectious morbidity was also higher in repeat cesarean group than VBAC group.
Conclusion: Fetal morbidity and mortality due to trial of labor is comparable with the women laboring without a scar, trial of labour may be encouraged. women given trial of labour with careful monitoring and taken for emergency LSCS on minimal indication is the best answer to management of previous one or two CS.

1. Introduction

The obstetric practice before 1970's was dictated by the phrase, "Once a caesarean always caesarean". Later, because of escalating rate of caesarean section, suggestions were made that vaginal birth after caesarean section might help in reducing caesarean section. VBAC is safe and effective in an appropriate clinical setting and properly selected group of women (Chhabra. S. and Arora G, 2006).[1]

Caesarean section is not a simple procedure and needs to be performed only when circumstances distinctly required it (Mukharjee S.N. 2006).[2] In 1916, Cragin[3] introduced the concept of 'once a caesarean always a Caesarean', when referring to a classical uterine incision. The present day dictum revolves around "the optimal management after a previous caesarean delivery" (Krishna Usha et al, 2001).[4] Maternal mortality associated with caesarean section can be 3 times that of vaginal delivery (Esteves-Pereira et al 2016).[5]

As pointed out by Emily R. Baker (1994),[6] most common indications for caesarean section are repeat section, dystocia, fetal distress and malpresentation.

The indications of caesarean section can be absolute like severe cephalopelvic disproportion or major degree of placenta previa and relative like accidental hemorrhage, failed induction or malpresentation (Pandey Nagendra Sardesh, 2006).[7]

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The Robson classification (also known as the 10-group classification) was proposed by the WHO. Later on, a modification to the Robson criteria is proposed.[8] It is used as a global standard for assessing, monitoring and comparing caesarean section rates both within healthcare facilities and between them.

The VBAC recommendations by American College of Obstetrics & Gynaecology, 1998-99, which were renewed in ACOG 2010[9] are as follows:

The criteria for selection of cases for VBAC are:

1. 1 or 2 prior lower transverse cesarean delivery.
2. Clinically adequate pelvis.
3. No other uterine scar or previous rupture.
4. Facility for emergency cesarean delivery
5. Availability of physician throughout active labour who is capable of monitoring labour and performing emergency cesarean delivery.

Factors affecting subsequent outcome are:

1. Type of prior uterine incision- Women with one prior low transverse cesarean have the lowest risk of scar rupture.
2. Indication for prior section- Women with a non recurrent indication- for example, breech presentation- have the highest VBAC rate of nearly 90% (Wing, 1999)[10]. Prior second-stage cesarean delivery can be associated with second- stage uterine rupture (Jastrow, 2013)[11]
3. Number of prior Caesarean section- There is a double or triple rate of rupture of uterus in women with two compared with one prior transverse cesarean. (Macones 2005;[12] Miller, 1994).[13]
4. Soundness of scar- The risk of uterine rupture is low if the thickness of this segment is >=2.5mm and high if thickness is <2mm (Jastrow 2016).[14]
5. Inter delivery interval- Intervals of <=18 months were associated with a threefold greater risk of scar rupture during a subsequent TOLAC compared with intervals >18 months (Shipp and co-workers, 2001).[15]
6. Prior vaginal delivery- The prognosis for a subsequent vaginal delivery is improved with prior vaginal delivery, either before or after a cesarean birth (Aviram, 2017;[16] Grinstead, 2004).[17]
7. Fetal size and lie- Increasing fetal size is inversely related to VBAC rates (Jastrow et al, 2010).[18]
8. Maternal obesity- Pre pregnancy body mass index (BMI) and VBAC rates appear to have an inverse relationship.
9. Multiple gestation- The risk of uterine rupture is not increased in twin pregnancy (Ford and associates (2006).[19]

The American College of Obstetricians and Gynaecologists the Society for Maternal-Fetal Medicine (2017)[20] recommends that nonmedicated indicated deliveries be delayed until 39 completed weeks of gestation or beyond.

Induction of Labor in cases of VBAC:

1. Medical Induction of Labour with PGE2 (dinoprostone) is associated with an increased risk of uterine rupture.
2. Oxytocin augmentation can be done in women undergoing TOL. In the Network study reported by Landon and colleagues (2004),[21] uterine rupture was more frequent in women induced with oxytocin alone- 1.1 percent – than in those in spontaneous labour- 0.4 percent.
3. The uterine rupture risk using a transcervical Foley catheter for labour induction(1.6 percent) was not significantly greater than that with spontaneous labour(1.1 percent) or with using amniotomy with or without oxytocin (1.2 percent) (Bujold, 2004).[22]

Labour should be managed with the help of partograph and signs of scar dehiscence like fetal distress, maternal tachycardia and hematuria must be vigilantly managed.

Contraindications to VBAC: -

1. Previous classical or inverted “T” uterine scar.
2. Previous Hysterotomy or Myomectomy entering the uterine cavity.
3. Previous uterine rupture.
4. Presence of a contraindication to labour such as placenta previa or malpresentation.
5. Women refuses TOL and request elective repeat caesarean.
6. Resources limited for emergency Caesarean delivery.

Advantages of VBAC over repeat Caesarean section are:

1. Avoiding another uterine incision.
2. Shorter Hospital stay.
3. Lower cost.
4. Faster recovery.
5. More immediate opportunity for bonding with the baby and for increasing the chances of successful breast feeding.

A perfect neonatal outcome being every obstetrician’s goal, a perinatal loss in caesarean section delivery causes much concern.

2. Aims and Objectives

1. To study the maternal and perinatal outcomes among women with previous Cesarean section at a tertiary care centre.
2. To analyze the demographic factors eg. Age.
3. To analyze the intraoperative complications in repeat cesarean sections.
4. To study complications arising during trial of labour after cesarean.

3. Materials and Methods

This prospective interventional study was conducted in Department of Obstetrics and Gynecology, S. S. Medical College and associated G.M.H. Rewa (M.P.) from March 2018 to Feb 2019 for a period of 12 months. Out of the total admissions of previous cesarean section, admitted through outpatient department or in emergency hours, 979 cases were taken in study, based on inclusion and exclusion criteria. The criteria taken into consideration are.

3.1. Inclusion criteria

1. Inter pregnancy interval >=18 months2. Multiple gestation with first fetus with vertex presentation3. Gestational age>=34 weeks.
2. Lower uterine segment incision in previous caesarean.
3. Pregnancy with one or two previous LSCS.
4. Postdated pregnancy with previous LSCS.

3.2. Exclusion criteria

1. Gestational age <34 weeks2. History of wound sepsis or dehiscence in previous LSCS3. Previous classical incision, other uterine scars or undefined scars (Eg: - Myomectomy scar)4. History of previous uterine rupture or scar dehiscence5. Pregnancy associated with other medical complications (eg- DM, HTN, Asthama, Heart Disease, Renal Disorder, Seizure Disorder).
2. History of complete perineal tear.
3. Uterine malformations (Congenital or acquired).
4. Interpregnancy duration <18 months.

All the cases were analysed prospectively and data was collected in a proforma, meeting the objectives of the study.

Out of 979 cases, 636 cases underwent elective repeat cesarean section, looking into the circumstantial safety of the mother and fetus. 343 were allowed for a trial of labour, out of them women who had failed TOL were taken for emergency LSCS for various indications.

Thus 979 cases included in the study were grouped into:

Group 1: Women who were elected for repeat CS without a trial of labour

Group 2: Women who were given a trial of labour and delivered vaginally

Group 3: Women who were given a trial of labour but due to failed trial, emergency repeat section was performed.

All study subjects were analyzed in thoroughly regarding age, parity, previous obstetric history including number of vaginal or cesarean deliveries and the indication for LSCS. A thorough general, physical, systemic and obstetric examination was done.

Women with gestational age upto 40 weeks were allowed for trial of labour after ruling out contraindication for vaginal delivery and ensuring that there was no obvious feto-pelvic disproportion,. Patients who were allowed for VBAC-TOL, were carefully monitored in intrapartum period for any sign of impending rupture like tachycardia, hypotension, scar tenderness, suprapubic bulge, vaginal bleeding, FHR variability and hematuria, etc.

Induction and augmentation of labour was done in selected cases with oxytocin and/or intracervical prostaglandins where the Bishop's score was poor. Progress of labour was noted with cervical dilatation, effacement, descent of head and uterine contraction. Labour was accelerated with artificial rupture of membrane in active labour wherever required.

In the cases where rupture was suspected TOL was immediately abandoned and taken for emergency laparotomy and necessary steps were taken promptly.

In all the cases that had undergone repeat LSCS, the indication for LSCS, intraopertaive and postoperative details were noted.

In both the group, the perinatal outcome was noted by analyzing the APGAR score, Birth weight, prematurity and neonatal morbidity and mortality.

The data were analyzed using various statistical tests and standard deviation tests.

4. Results and Discussion

4.1. During this study period

1. Total number of cesarean deliveries =2243.
2. Total number of cases with previous cesarean section at the time of admission = 1080.
3. Total number of cases fulfilling the inclusion criteria of the study=979.
4. Total number of VBAC = 226.
5. Total number of emergency LSCS = 117.

Table 1: Age

S. No.	Age(years)	Cases	%
1.	19	6	0.6
2.	20-24	362	37
3.	25-29	480	49.05
4.	30-34	117	11.99
5.	>=35	14	1.4

Table 1 shows that maximum women 842 (86%) were in the age group between 20-30 years followed by 131(12%) above 30 years of age. This is the most fertile period of a woman.

This corresponds to the observations made by Minsart et al (2013)[23] which states that maximum number of successful VBAC was associated with those in the age group <35 years.

It is evident from the Table 2 that majority 634 (64.76%) cases were second gravida, 27.68% were third gravida and 7.56% were gravida >3.This is due to the fact that in the current scenario maximum number of parents wish to have

Table 2: Gravidity

S.No.	Gravidity	Cases	%
1.	G2	634	64.76
2.	G3	271	27.68
3.	G4	34	3.47
4.	>=G5	40	4.09

a nuclear family and limited number of children i.e. 2 or 3 which can be taken care of in a better way.

Table 3: Mode of delivery in TOLAC(n=343) VBAC (n=226) (65.89%)

S.No.	Delivery method	No.	%
1.	Spontaneous delivery	96	42.48
2.	Augmentation with ARM	62	27.43
3.	Augmentation with ARM+Oxytocin	14	6.19
4.	Augmentation with mechanical dilatation	36	15.93
5.	Augmentation with PGE2	18	4.97

Trial of labour was given in 343 cases out of which VBAC occurred in 226 (65.89%) cases, out of them 96 (42.48%) were spontaneous vaginal deliveries and in rest 130 cases augmentation was done with mechanical or chemical methods. Comparable to present study VBAC success rate was 61.4% in study conducted by Shah Jitesh Mafatlal et al (2009).[24]

Table 4 shows various intraop findings eg. Adhesions (13.67%), bladder advancement and edema (5.98%), thinned out LUS (11.11%), Vascular LUS (3.41%), scar dehiscence (4.27%), and complications eg. change of uterine incision (3.41%), hemostatic suture (2.56%) and blood transfusion(2.56%). These were more commonly associated with emergency LSCS-TOL.

A bad hypertrophied scar needed excision which increased the duration of surgery. Adhesion between various layers of abdominal wall and abdominal structure, between general and visceral peritoneum needed time consuming adhesionlysis and posed difficulty in opening the abdomen. Adhesiolysis needs surgical skill and experience of an obstetrician.

Extension of uterine incision was more common during emergency LSCS (3.41%) than ERCS (1.26%).

M.A. Ramakrishna Rao(2008)[25] found intraperitoneal adhesions of varied types in 73 out of 287 cases (25.43%) in his study. The adhesions in our study were less; the reason may be that most of the primary sections were done in same institute (GMH) either by skilled surgeons or under their supervision by resident doctors.

It is evident from the Table 5 that perinatal morbidity occurred in 67 babies from which perinatal morbidities like birth asphyxia (1.9%) and meconium aspiration syndrome(2.4%) were more common in Elective LSCS than VBAC.

Comparing overall fetal morbidity among 3 groups ERCS (74.62%), VBAC (2.65%), LSCS – TOL (9.40%), fetal morbidity was higher in the ERCS than following VBAC. But this cannot be attributed solely to complications arising out of ERCS as the trial of labour is given only to cases that are uncomplicated or less complicated and the complicated cases were directly taken for LSCS without any trial of labour. This makes the neonates delivered by LSCS more likely to be admitted in NICU.

It is evident from the Table 6 that NICU admission was seen in 27 cases out of which, in 303% elective cases babies were admitted in NICU and in 2.56% cases of emergency LSCS babies got admitted to NICU

Loebel et al (2004)[26] also found that the neonatal morbidity and mortality after ERCS was more as compared to VBAC. NICU admission was seen in 2.8% cases in Elective repeat LSCS cases and in 1.1% cases in VBAC. Perinatal death was seen in 2.1% cases in ERCS, while it was seen only in 0.5 % cases of VBAC.

Similar results were obtained by Jinturkar et al (2014)[27] in their study in which NICU admissions were more in repeat LSCS group(2.12%) than the VBAC group (0.3%).

The process of normal vaginal delivery aids the neonate in better initiation of respiration and decreases the chances of birth asphyxia. Birth asphyxia is one of the major causes leading to NICU admission at birth and post delivery.Complicated cases with more chances of perinatal morbidity and mortality like severe oligohydramnios, preeclampsia, APH, etc. are taken for Elective LSCS without trial of labour. Hence, babies delivered by LSCS have a higher chance of NICU admission and perinatal mortality.

Table 7 shows that post delivery maternal complications like hospital stay for more than 4 days (9.96%), requirement of post natal IV/IM analgesia (86.85%), paralytic ileus (3.19%) and prolonged catheterization (8.37%) was more in LSCS than VBAC.

Our results were also comparable to those of Yun-Xiu Li et al (2018)[28] in which requirement of post op analgesia was more in the LSCS group (90.4% cases) than the VBAC group (9.6%).

1. Ileus- It occurs from hypomotility of the gastrointestinal tract in the absence of mechanical bowel obstruction. Sepsis, diabetes, hypothyroidism, anaemia, low potassium can be the predisposing factors
2. Post-partum urinary retention leading to prolonged catheterization.
3. Post surgical fatigue and pain- It may affect woman from caring and breastfeeding of the newborn. This is more common in women following delivery by cesarean section and requires IV/IM analgesia for pain relief.

Table 4: Intraoperative/ Intranatal finding, complication and modification

S. No.	Finding	Elective LSCS (n=636)		Emergency LSCS (n=117)		VBAC(n=226)		Total(n=979)	
		No.	%	No.		No.	%	No.	%
1.	Adhesion*	82	12.89	16	13.67	0	0	98	10.01
2.	Bladder advancement and edema	18	2.83	7	5.98	0	0	29	2.96
3.	Thinned out LUS	42	6.6	13	11.11	0	0	55	5.61
4.	Vascular LUS	18	2.83	4	3.41	0	0	22	2.24
5.	Scar dehiscence	0	0	5	4.27	0	0	5	0.51
6.	Bicornuate uterus, Unicornuate uterus,other uterine anomalies	18	2.83	3	2.56	0	0	21	2.1
7.	Extension of uterine incision	8	1.26	4	3.41	0	0	12	1.22
8.	Change of uterine incision**	13	2.04	4	3.41	0	0	17	1.74
9.	Hemostatic suture	8	1.26	3	2.56	0	0	11	1.12
10.	Intraoperative/ Intranatal hemorrhage	7	1.1	1	0.85	1	0.44	9	0.92
11.	Blood transfusion required	7	1.1	3	2.56	1	0.44	11	1.12

$\chi 2 = 6.87$, p value=0.004 significant
*Peritoneal, omental, bladder, others
** J shape, inverted T, U shape

Table 5: Perinatal outcome

S. No.	Characteristic	Elective LSCS (n=636)		Emergency LSCS (n=117)		VBAC (n=226)		Total(n=979)
		No.	%	No.	%	No.	%	No.
1.	Stillbirth	5	0.78	1	0.85	1	0.44	16
2.	NICU admission	21	3.30	3	2.56	3	1.32	27
3.	Neonatal deaths within 24 hours of birth	6	0.94	2	1.70	1	0.44	9
4.	Death within 7 days after birth	8	1.25	1	0.85	1	0.44	10

$\chi 2 = 8.76$, p value=0.003 significant

Table 6: Perinatal morbidity and mortality

S.No.	Perinatal outcome	Elective LSCS(n=636)		Emergency LSCS(n=117)		VBAC (n=226)	
		No.	%	No.	%	No.	%
1.	Birth asphyxia(HIE)	12	1.9	2	1.7	1	0.4
2.	Meconium Aspiration Syndrome	15	2.4	4	3.4	2	0.9
3.	Prematurity	9	1.4	2	1.7	1	0.4
4.	Congenital anomaly	7	1.1	1	0.8	1	0.4
5.	Neonatal sepsis	7	1.1	2	1.7	1	0.4

$\chi 2 = 4.48$, p value=0.004 significant

Table 7: Post delivery maternal morbidity

S. No.	Condition	LSCS(n=753) No.	%	VBAC(n=226) No.	%
1.	Hospital stay more than 4 days	75	9.96	7	3.09
2.	Ambulation after more than 72 hours	84	11.15	0	0
3.	Requirement of postnatal IV/IM analgesia	654	86.85	45	19.91
4.	Oral solid diet intake within 24 hours post delivery	446	59.23	201	88.93
5.	Paralytic ileus	14	1.85	0	0
6.	Prolonged catheterization(>3 days)	34	4.51	0	0

$\chi 2 = 11.89$, p value=0.004 significant

5. Conclusion

Trial of labour is like a double edged sword, if the woman achieves VBAC, she has the benefits of short hospital stay, decreased morbidity and less expenditure but if TOL fails resulting in LSCS, there is likely to occur maternal and fetal morbidity. Elective repeat cesarean section has its inherent risks of major intra abdominal surgery. Women given trial of labour with careful monitoring and taken for emergency LSCS on minimal indication is the best answer to management of previous one or two CS.

6. Source of Funding

None.

7. Conflict of Interest

None.

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