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Fetomaternal Outcomes of Pregnancy with Multiple Repeat Caesarean Sections in a Tertiary Hospital in North-East India

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Abstract:
Introduction: *Caesarean section is one of the most commonly performed surgical procedures all over the world associated with high maternal and fetal morbidity and even mortality.*
Aims and objects: *To determine the fetomaternal outcomes in pregnancy with previous two or more caesarean sections.*
Materials and methods: *We performed an observational clinical study over 9 months on patients with previous two or more caesarean sections. Maternal complications and fetal outcomes were evaluated.*
Results: *Total 102 (1.48%) had previous two or more caesarean sections out of which only 1 patient had previous three caesarean sections. 92.2% cases were booked at RIMS antenatal clinic with three or more antenatal visits and 7.8% cases were unbooked. 68.6% patients underwent elective caesarean section while 31.4% patients underwent emergency caesarean section. Placenta previa was encountered in 7.8% patients of which 2% had morbid adhesion. The most common intraoperative complication was the presence of adhesions (23.5% cases) followed by haemorrhage(10.8%), thin LUS(2.9%), bladder injury(1.0%), scar dehiscence (1.0%). BT was needed in 14.7% cases, peripartum hysterectomy was done in 3.9% patients. There was no case of maternal mortality. 8 babies were born with low birth weight(<2.5 kg), 4(3.9%) babies had APGAR score <7 at 5th minute of birth and were subsequently admitted in NICU and were subsequently discharged. There was no stillbirth or neonatal mortality. Intraoperative complications and interventions were found to be significantly higher in the unbooked patients than in the booked ones and also in the patients with emergency CS than in those with elective CS.*
Conclusion: *Fetomaternal complications are increased in multiple repeat caesarean sections. Risk reduction may be possible by managing in tertiary centres, following strict indications in first CS, regular antenatal checkups and prior anticipation and preparedness for complications.*
Keywords: *multiple caesarean sections, maternal morbidity, fetal outcomes.*

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I. Introduction:

Caesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall and the uterine wall[1]. Caesarean section is the most common obstetric operative procedure worldwide with a rising trend in both developed and developing countries over the last couple of decades due to a number of factors like improvement of surgical and anaesthetic techniques, reduction of post operative complications and perception of greater safety during the procedure.[2] Thus, this has led to increased rate of repeated caesarean sections, but debatable its risks and benefits. Different studies done over time show that repeat caesarean section is associated with many complications like increased haemorrhage, adhesions, uterine extension, bladder and bowel injury, scar dehiscence, etc. The most unacceptable complications of repeat caesarean section include risk of scar rupture during pregnancy, increased incidence of abnormal placentation, unplanned peripartum hysterectomy

carried out typically as a last resort to control life threatening haemorrhage which is often caused by placenta praevia, placenta accreta, uterine atony and uterine rupture.[3] The overall maternal and fetal morbidity is reported to rise linearly with each successive caesarean section.[4] The present study evaluates the obstetric and fetal outcomes of patients with a history of two or more previous ceasarean sections.

II. Materials and methods:

The present study is an observational clinical study of all pregnant patients admitted in the Department of Obstetrics and Gynaecology, RIMS, Imphal with history of two or more previous caesarean sections(CS) over a period of 9 months from March 2017 to November 2017. Primigravidae, patients with previous one caesarean section and those who did not give consent were excluded from the study. Data collection was done in structured form with details of: (a) maternal variables like age, parity, booking status, number of previous caesarean sections, period of gestation at delivery, type of caesarean section whether classical or LSCS, the mode of operation whether emergency or elective (b) intraoperative complications like adhesions, excessive blood loss during surgery, thin LUS, scar dehiscence, presence of placenta previa or accreta, bladder or bowel injury (c) interventions needed like need for caesarean hysterectomy, blood transfusion, internal iliac or uterine artery ligation and (d) fetal variables like sex, weight, need for NICU admission, APGAR score at 5^{th} minute, preterm births, still birth. A total of 102 pregnant patients with history of two or more previous caesarean sections were studied and results are discussed as follows.

III. Statstical analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test used when cell samples are very small.

Significant figures

+ Suggestive significance (P value: $0.05<P<0.10$)

* Moderately significant (P value:$0.01<P \leq 0.05$)

** Strongly significant (P value : $P \leq 0.01$)

Statistical software namely SPSS 18.0, and R environment ver.3.2.2 were used.

IV. Results

Out of the total 6885 patients delivered in the study period, 102 (1.48%) had history of previous two or more caesarean sections forming the study group. Out of 102 patients 101(99%) patients had previous two caesarean sections and only 1(1%) patient had previous three caesarean sections. There were no patients with more than three previous caesarean sections. Maximum women with previous two or more CS were in the age group of 31 to 40 years (57.8%) and the mean ±SD was found to be 32.72±6.07. Lower Segment Caesarean Section(LSCS) was done in 99(97.1%) patients while 3(2.9%) patients underwent classical CS.

Table 1 : Booked/Unbooked status of patients studied

Booked/Unbooked	No. of patients	%
Booked	94	92.2
Unbooked	8	7.8
Total	102	100.0

Out of the total 102 cases, 92.2% (n=94) cases were booked at RIMS antenatal clinic with three or more antenatal visits and 7.8%(n=8) cases were unbooked cases attended as emergencies.

Table 2: Mode of Caesarean Section in patients studied

Mode of CS	No. of patients	%
Elective	70	68.6
Emergency	32	31.4
Total	102	100.0

Out of the total 102 patients studied, 68.6% (n=70) patients underwent elective caesarean section while 31.4% (n=32) patients underwent emergency caesarean sections.

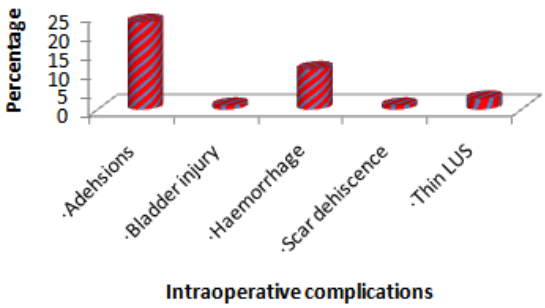
Table 3: Placenta Previa in patients studied

Placenta Previa	No. of patients	%
Nil	94	92.1
Placenta previa without morbid adhesion	6	5.9
Placenta previa with morbid adhesion	2	2.0
Total	102	100.0

Out of the total 102 cases, 8(7.8%) patients had placenta previa, 6(5.9%) had placenta previa without morbid adhesion whereas 2(2.0%) had placenta previa with morbid adhesion.

Table 4: Intraoperative complications of patients studied

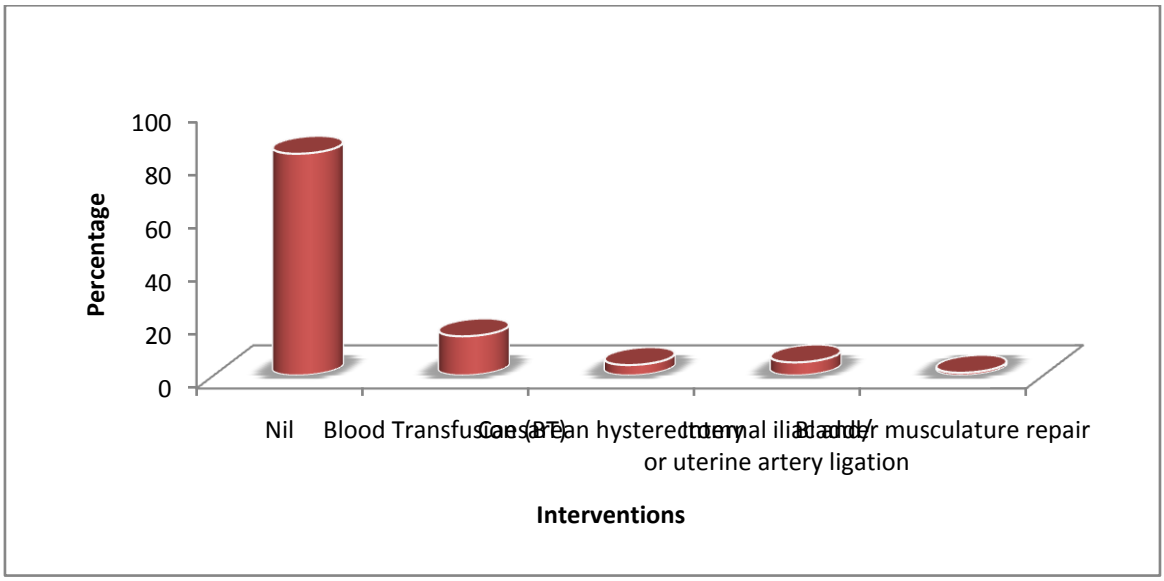
Intraop complications	No. of patients (n=102)	%
Nil	71	69.6
Yes	31	30.3
• Adhesions	24	23.5
• Haemorrhage	11	10.8
• Bladder injury	1	1.0
• Scar dehiscence	1	1.0
• Thin US	3	2.9



Intraoperative complications were observed in 30.3%(n=31) patients whereas 69.6%(n=71) patients had uncomplicated CS. The most common complication was the presence of adhesions found in 23.5% cases(n=24). The other complications were haemorrhage(n=11, 10.8% cases), bladder injury(n=1, 1.0%), scar dehiscence (n=1,1.0%) and thin LUS(n=3, 2.9%)

Table 5: Intraoperative interventions in patients studied

Interventions	No. of patients (n=102)	%
Nil	85	83.3
Blood Transfusion(BT)	15	14.7
Subtotal hysterectomy	4	3.9
Internal iliac and/or uterine artery ligation	5	4.9
Bladder musculature repair	1	1.0



BT was needed in 15(14.7%)cases, peripartum hysterectomy was done in 4(3.9%)patients, Internal iliac or uterine artery ligation was needed in 5(4.9%) cases and bladder musculature repair was done in 1(1%) case. There was no case of maternal mortality

Table 6: Period of gestation(POG) at delivery of patients studied

POG	No. of patients	%
<37	12	11.8
37-40	82	80.4
>40	8	7.8
Total	102	100.0

Out of the 102 patients, 12(11.8%) patients had preterm deliveries and maximum patients, that is 90 (88.2%)had term deliveries. And the mean POG at delivery was Mean ± SD 38.17± 1.56.

Table 7: Details of neonates

	No. of patients (n=102)	%
Weight (kg)		
<2.5	8	7.8
2.5-3.9	92	90.2
≥4	2	2.0
Gender		
Female	48	47.1
Male	54	52.9
APGAR Score		
<7	4	3.9
≥7	98	96.1
NICU admission		
Not Admitted	98	96.1
Admitted	4	3.9

8 (7.8%) babies were born with low birth weight(<2.5 kg) ,48(47.1%) babies were female and 54(52.9%) babies were male. 4(3.9%) babies had APGAR score <7 at 5th minute of birth and were subsequently admitted in NICU and subsequently discharged. There was no stillbirth or neonatal mortality.

Table 10. Comparison of Intraoperative complications and interventions between booked and unbooked patients

variables	Booked/Unbooked		Total (n=102)	P value
	Booked (n=94)	Unbooked (n=8)		
Intraoperative complications				
Nil	69(73.4%)	2(25%)	71(69.6%)	0.008**
Adehsions	20(21.3%)	4(50%)	24(23.5%)	
Bladder injury	1(1.1%)	0(0%)	1(1%)	
Haemorrhage	10(10.6%)	1(12.5%)	11(10.8%)	
Scar dehiscence	0(0%)	1(12.5%)	1(1%)	
Thin LUS	2(2.1%)	1(12.5%)	3(2.9%)	
Interventions				
Nil	81(86.2%)	4(50%)	85(83.3%)	0.069+
BT	11(11.7%)	4(50%)	15(14.7%)	
Subtotal hysterectomy	4(4.3%)	0(0%)	4(3.9%)	
BL internal iliac artery ligation	4(4.3%)	1(12.5%)	5(4.9%)	
Bladder musculature repair	1(1.1%)	0(0%)	1(1%)	

Intraoperative complications were found to be higher in the unbooked patients than in the unbooked ones and the difference was statistically significant. Intraoperative interventions were also more in the unbooked patients and the difference statistically suggests significance.

Table 11: Comparison of Intraoperative complications and interventions between patients with emergency and elective mode of CS :

complications	Mode of CS		Total (n=102)	P value
	Elective (n=70)	Emergency (n=32)		
Intraoperative complications				
Nil	55(78.6%)	16(50%)	71(69.6%)	<0.001**
Adhesions	13(18.6%)	11(34.4%)	24(23.5%)	
Bladder injury	1(1.4%)	0(0%)	1(1%)	
Haemorrhage	4(5.7%)	7(21.9%)	11(10.8%)	
Scar dehiscence	0(0%)	1(3.1%)	1(1%)	
Thin LUS	0(0%)	3(9.4%)	3(2.9%)	
Intraoperative Interventions				
Nil	64(91.4%)	21(65.6%)	85(83.3%)	<0.001**
BT	5(7.1%)	10(31.3%)	15(14.7%)	
Subtotal hysterectomy	1(1.4%)	3(9.4%)	4(3.9%)	
BL internal iliac artery ligation	2(2.9%)	3(9.4%)	5(4.9%)	
Bladder musculature repair	1(1.4%)	0(0%)	1(1%)	

Intraoperative complications and interventions were found more in the patients with emergency CS than in those with elective CS and this difference was also found statistically strongly significant

V. Discussion:

There is a widespread concern about increasing caesarean sections leading to an increased proportion of women with history of prior caesarean delivery. Multiple caesarean sections predispose to increased risk of complications. Data regarding the maternal and fetal risks of repeated multiple caesarean sections will help in counseling women before undertaking trial of labour or undergoing a planned repeat CS and will also help in considering tubal ligation during CS to prevent further unwanted pregnancies and associated complications.

In the study no woman had more than three previous caesarean sections because of small family norm in our country where pregnant women with previous two or more caesarean sections are counselled for tubal ligation. So it is difficult to find women with more than three previous caesarean sections. This is in contrast to countries like Saudi Arabia where social and cultural influences encourage large family and thus women with six or seven CS.[5]

Wuttikonsammakit P et all found the mean age for 140 women with previous two or more caesarean sections was 33.4±4.7 in a retrospective study on pregnancy outcomes of multiple caesarean sections which is almost similar to the present study.

In the present study, patients undergoing elective CS (68.8%) were more than those undergoing emergency CS (31.4%) whereas Nazneen S et al found emergency CS were more than elective CS in a similar observational study. This may be because in our study booked cases(92.2%) were more than unbooked cases(7.8%) and thus more patients had planned elective CS.[7]

Placenta previa and placenta accreta were found in 7.9% and 2% patients respectively in this study. Nazneen S et all found approximately similar incidences of 5.21% and 2% respectively in 115 women with prior 2 or more caesarean sections in their study supporting our findings. Increased risk of placenta previa in cases of repeat caesarean section as compared to general obstetric population as suggested by these findings may be due to increased parity, presence of caesarean section scar resulting in poor decidualization at the scar site which promotes trophoblastic invasion into the myometrium preventing placental trophotrophism when the uterus grows and lower segment develops. [7]

In this study, the most common complication was adhesions observed in 23.5% patients. Adhesions may lead to other complications like excessive bleeding, organ injury, difficulty and delay in delivering the baby, long term complications like chronic pelvic pain. Generally, the incidence of adhesions is within the 34.76 – 65% range, depending on the number of cesarean sections.[7,8] Several studies reported that increasing number of cesarean sections increase the adhesion rate.[9,10]

Nazneen S et al observed excessive blood loss in 8% of patients with prior 2 or more CS mostly because of atonic PPH and other causes like trauma and abnormal placentation subsequently increasing the need for blood transfusion and thus supporting the findings of the present study.[7] In this study bladder injury and subsequent repair was found in 1% patient and studies have observed the occurrence of the same in .09% to 5.6% intraoperatively in women with prior 2 or more caesarean sections.[7,11] In the present study Thin LUS was found in 2.9% patients where as Nazneen et al found the same in 7.82% patients.[7] Qublan HS et al found scar dehiscence in 0.8% of 1093 patients with previous 2 or more caesarean sections in their retrospective study on multiple repeat caesarean sections approximately similar to the present study where scar dehiscence was seen in 1 out of 102(0.98%) patients.[11]

Hysterectomy is another dreadful complication mostly due to placenta previa, placenta accreta, uterine atony and uterine rupture.[12] The incidence of Caesarean hysterectomy in the study was found to be 3.9% which is quite higher than in other studies.[7,13,14] Most of the hysterectomies, that is, 3 out of 4 (75%) were done for intractable bleeding from placenta previa as found in other studies.[15,16] There was no case of maternal mortality.

Qublan et al found preterm deliveries in 12.5% patients with previous two or more caesarean sections almost similar to the present study where 11.8% patients had preterm deliveries.[11] According to a national prospective cohort study in UK, neonates of mothers having multiple repeat caesarean sections were significantly more likely to be born prior to 37 weeks.[17]

There case was no case of stillbirth in the study similar to study Nazneen et al.[7] Low APGAR score (<7 at 5 minutes of birth)was noted in 4(3.9%) babies subsequently leading to admission in NICU which is supported by other studies with low APGAR score in 5.06% babies.[11]

The intraoperative complications like adhesions, thin lus, scar dehiscence, bladder injury, excessive blood loss were all significantly higher in the unbooked patients($p=0.008$) than the booked ones and also the complications were significantly higher during emergency CS than in elective CS($p<0.001$). The various intraoperative interventions needed like blood transfusion, caesarean hysterectomy were higher during emergency caesarean sections than in the elective ones. These findings are supported by a number of other studies.[18,19.]. The reason is that most of the unbooked cases in our tertiary hospital are met as emergencies. Elective CS are done at a pre-arranged time with best quality obstetrics, anaesthesia, neonatal resuscitation services whereas emergency CS are done due to unforeseen or acute obstetric emergencies and hence are associated with greater morbidity and mortality than elective procedures.

VI. Conclusion

Overall maternal risks are increased in women with multiple caesarean sections but risk reduction is possible if women are managed in a tertiary care hospital. Women with prior caesarean section should have regular antenatal check ups and should be booked so that repeat caesarean sections can be done on an elective basis reducing the complications. CS should be done only when exclusively necessary during first child birth. Properly selected women should be encouraged for VBAC(Vaginal Birth after Caesarean Section) after counseling about risks and benefits of planned VBAC and repeat CS and thus reducing patients with history of previous CS. VBAC has been done in 6% cases of previous once CS patients in our institute in the same study period. Women must be informed about the related risks of multiple repeated caesarean sections and tubal ligation needs to be encouraged. Women undergoing repeat caesarean section with placenta previa should be counseled about the associated risk of excessive blood loss, need for blood transfusion and possibility of caesarean hysterectomy the necessary preparations made beforehand.

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