



RESEARCH ARTICLE



EVALUATION OF MATERNAL AND FETAL OUTCOME AND COMPLICATIONS IN MULTIPLE REPEAT CAESAREAN SECTIONS

Samar Mukhtar^{1*} | Asma Mufti² | Shazia Ashraf³

¹Senior Resident, Department of Obstetrics, Government Medical College, Srinagar

²Senior Resident, Department of Obstetrics, Government Medical College, Srinagar

³Assistant Professor, Department of Obstetrics, Government Medical College, Srinagar

Abstract

Objective: To study maternal and fetal outcome and to determine the complications and difficulties faced by the operating surgeon in women who undergo multiple repeat caesarean sections.

Methodology: A prospective study was carried in government Lalla Ded Hospital over a period of one and a half year in which patients undergoing repeat caesarean sections were divided in 2 groups. The study group included those women undergoing fourth or higher order caesarean sections and the control group included those having previous one or two caesarean sections. The demographic criteria, neonatal outcome and the incidence of maternal complications like adhesions, scar dehiscence or rupture, placenta previa and accreta were noted and compared.

Results: Maternal age and parity was higher in the study group. Gestation at caesarean section was less in the study group. Birth weight, along with 1- and 5- minute Apgar scores were lower in the study group, but the difference was not statistically significant. There were no significant differences in preterm birth rates, NICU admission and postpartum neonatal follow-up with related morbidity conditions. Duration of surgery, was longer in study group (55±18.4 mins) than control groups (44±16.6mins). Adhesions were encountered in higher number of cases in study group as compared to control group; 67 cases (47.86%) versus 54 (27%) cases, the difference being statistically significant. Uterine scar dehiscence was found in 10.7% patients in study group as against 4.5% patients in control group, the difference being statistically significant. Abnormal placentation, placenta praevia and accreta were almost of equal occurrence in both the groups

Conclusion: This study demonstrated that as compared to previous one and two caesarean sections, higher order repeat caesarean sections have increased complication rates and more difficulties encountered during surgery.

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1 | INTRODUCTION

During the past two decades, the rate of caesarean delivery in the developed world has been steadily increasing. As per W.H.O data, highest Caesarean section rates are currently in Latin America and the Caribbean (40%) while North America has 32% and Africa 7%. In Europe around 25% births need surgical intervention. For India, similarly, National Family Health Survey showed that the C-section rates in the period 1992-2015 grew from 9.5% to 23% of all hospital births¹. There are numerous factors which contribute to an increased Caesarean sections rate, including a decline in vaginal birth after caesarean delivery due to the risk of uterine rupture, increasing maternal age and rates of labor induction, decreased use of operative vaginal delivery, and medico-legal concerns². Some authorities have even advocated routine, elective primary Caesarean delivery³. The latest improvements in the safety of anesthesia, pre- and post-operative monitoring, antibiotic use, and the accessibility of blood and blood products has had an impact on the increase in the number of repeat Caesarean deliveries⁴.

The most unacceptable complication of repeat caesarean section is a risk of scar rupture during pregnancy, second only to death after three or more cesarean sections,⁵ with increased risk of maternal and fetal mortality.⁶ It may present in different ways, which can vary from asymptomatic scar dehiscence to obvious uterine rupture, and is often accompanied by elevated morbidity and mortality, not only in the mother, but also in the fetus.

The aim of the present study was to determine the fetal and maternal outcome in higher order repeat caesarean sections and increase in complication rates during the fourth or subsequent repeat cesarean section.

2 | METHODOLOGY

This study was conducted in Department of Obstetrics and Gynaecology of Government Lalla Ded Hospital, Srinagar, Jammu n Kashmir. This hospital, being Tertiary care hospital has inpatient admission

of around 100 per day and has 24 hour functional Operation Theatre facility. Of the large number of caesarean sections done, large proportion of patients have previous one or more caesarean sections. This study was conducted over a period of one and a half year from January 2019 to June 2020 in which patients with previous caesarean sections were divided in two groups. The study group comprised 140 women of which 5 cases underwent their fifth Caesarean section and 135 cases their fourth Caesarean. A control group of 200 cases was formed by selecting patients delivered by caesarean section with one or two previous Caesarean deliveries operated on the same day as cases of study group. Those women undergoing their first Caesarean section were excluded from this control group. In our hospital, elective Caesarean sections are planned between 38.0 and 39.5 gestational weeks for those women who have undergone previous two or fewer Caesarean deliveries and between 37.0 and 38.0 weeks for higher order repeat caesarean deliveries. A proportion of patients in both the groups underwent emergency caesareans before the scheduled time because of various indications.

Data was obtained by recording all the concerned information which included demographic, intraoperative, postoperative and neonatal parameters. Demographic parameters of pregnant women included age, gravidity, number and date of the previous CDs, gestational week at delivery, and pelvic examination on admission for delivery. Intra-operative parameters included rate of tubal ligations, uterine scar fenestration, uterine rupture, adhesions involving the omentum, peritoneum and cranial bladder, incidences of placenta previa, placental abruption and placentation abnormalities, the need for additional surgical interventions, such as hysterectomy, repair of bladder injuries, repeat laparotomy and time taken for the

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Corresponding Author: *Samar Mukhtar*
Senior Resident, Department of Obstetrics, Government Medical College, Srinagar
Email: smsamarsiddiqi@gmail.com

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entire operative intervention. Post-operative complications included the need for transfusion following measurement of pre and post-operative hemoglobin levels and patient complaints, incidences of post-operative fever and infection, and length of hospital stay for the entire procedure. The study also included the following neonatal parameters: birth weight, Apgar scores (1 and 5 minutes), incidence of small for gestational age (SGA), rate of preterm delivery before 35 weeks, need of neonates for observation in different neonatal units, and neonatal mortality rate.

Statistical Methods: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean \pm SD and categorical variables were summarized as frequencies and percentages. Student's independent t-test or Mann-Whitney U-test, whichever feasible, was employed for comparing continuous variables. Chi-square test or Fisher's exact test, whichever appropriate, was applied for comparing categorical variables. A P-value of less than 0.05 was considered statistically significant. All P-values were two tailed.

3 | RESULTS

Demographic clinical features of the study and control groups are presented in Table 1. Maternal age and parity was higher in the study group. Gestation at cesarean section was less in the study group. Delivery occurred approximately 1 week earlier in the study group compared with the control group ($p < 0.001$). The mean gestational age at delivery was 36 \pm 1.6 weeks in the study group and 37 \pm 1.8 weeks in the control group. No maternal deaths occurred in either of the groups studied. 23 (16.43%) patients in study group had general anaesthesia due to anticipation of more operative complication. In study group, a higher percentage (80%) underwent elective caesarean.

The neonatal data are presented in Table 2. Birth weight, along with 1- and 5- minute Apgar scores were lower in the study group, but the difference was not statistically significant. The mean birth weight

in study group was 3.1 \pm 0.5 kgs and in control group was 3.3 \pm 0.4 kgs. There were six (4.28%) fetal and/or neonatal deaths in the study group and 5 (2.5%) neonatal death in the control group ($p = 0.359$). The causes of fetal death in study group were placental abruption and intrauterine fetal death in two cases, uterine rupture and fetal death in two cases, intrauterine fetal death of unknown cause in one case and severe neonatal abnormalities in one case (1 cardiac abnormality). The cause of neonatal death in the control group was placental abruption and fetal death in one case, uterine rupture in two cases and unexplained intrauterine death in two cases. We found no statistically significant differences in preterm birth rates, NICU admission and postpartum neonatal follow-up with related morbidity conditions.

Duration of surgery, time taken from skin incision to closure of abdomen was longer in study group (55 \pm 18.4) than control groups (44 \pm 16.6). This difference was statistically significant, possibly because of increase in all the complications which altogether increased the operative time. Massive Blood loss (>1000ml) was more frequent in the study population than in control group which led to increased blood transfusion rates in study group.

Adhesions were encountered in higher number of cases in study group as compared to control group; 67 cases (47.86%) versus 54 (27%) cases, the difference being statistically significant. Intraperitoneal adhesions, adhesion formation between the omentum and adjacent organs, and high and tight attachment of the bladder flap over the isthmic area were more common in the study group.

Uterine scar dehiscence was found in 10.7% patients in study group as against 4.5% patients in control group, the difference being statistically significant. In the study group uterine scar fenestration (incomplete uterine rupture) was seen in nine patients and six patients had complete uterine rupture. There were nine patients in the control group with uterine scar dehiscence, seven with incomplete dehiscence and two with complete rupture.

Abnormal placentation, placenta praevia and accreta were almost of equal occurrence in both the groups. Caesarean hysterectomy was done in 7 (5%) cases in study group and in 6 (3%) cases in control group.

TABLE 1: Demographic and clinical features of women in study and control group

Variable	Study Group (N=140) (Mean +-SD)	Control Group (N=200) (mean+- SD)	P value
Age	34.1±4.4	32.2 -2.4	<0.001*
Parity	4+1.7	3+1.4	<0.001*
Gestational age	36±1.6	37±1.8	0.179
Mode of operation	Elective	112 (80%) 28	<0.001*
	Urgent	(20%) 117	
Anaesthesia	Spinal	(83.57%) 23	0.376
	General	(16.43%)	

*Statistically Significant Difference (P-value<0.05)

TABLE 2: Neonatal characteristics in two groups

Variable	Study Group (N=140) Mean+-SD	Control Group (N=200) Mean +-SD	P value
Birth weight (kgs)	3.1±0.5	3.3±0.4	0.283
APGAR score	1 min	8.4±0.3	0.112
	5 min	9.1±0.4	9.2±0.3
Preterm births	20 (14.28%)	26 (13%)	0.733
NICU Admission	5 (3.57%)	4 (2%)	0.586
Fetal death	6 (4.28%)	5 (2.5%)	0.359

*Statistically Significant Difference (p value <0.05)

TABLE 3: Intra-operative and Post operative data in the study and control groups

Variable	Study Group (N=140) Mean+-SD	Control Group (N=200) Mean +-SD	P value
Duration of surgery (mins)	55±18.4	44±16.6	<0.001*
Blood loss (>1000ml)	28 (20%)	30 (15%)	0.228
Adhesions	67(47.86%)	54 (27%)	<0.001*
Placenta praevia	10 (7.1%)	15 (7.5%)	0.901
Placenta accreta	6(4.2%)	8 (4%)	0.896
Caesarean hysterectomy	7 (5%)	6 (3%)	0.219
Bladder injury	4 (2.8%)	3 (1.5%)	0.386
Uterine dehiscence	15(10.7%)	9 (4.5%)	0.028*
	Complete	6(4.3%)	
Incomplete	9(6.4%)	7 (3.5%)	
Blood Transfusion	20(14.28%)	22 (11%)	0.365
SICU Admission	3(2.14%)	2 (1%)	0.686
Hospital stay	4.8±1	3.5±1.0	<0.001*

Statistically Significant Difference (p value <0.05)

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5 cases of placenta accreta and 2 cases of complete uterine rupture in study group required caesarean hysterectomy while in control group, 5 cases of placenta accrete and 1 case of complete uterine rupture require hysterectomy.

Blood transfusion was required in 14.28% in study group and 11% cases in control group. Three patients in study group were admitted in SICU of which two cases were of placenta accreta and one case of complete uterine rupture while in study group two patients, one of placenta accreta and one of uterine rupture were admitted in SICU in study group.

4 | DISCUSSION

Even if Caesarean delivery has become safer⁷, it is still associated with elevated maternal morbidity and mortality compared with vaginal birth⁸. As the rate of primary Caesarean deliveries increases and the rate of vaginal birth after caesarean decreases, the number of women who will undergo multiple Caesarean deliveries will increase. One of the main contributing factors to increasing Caesarean delivery rates is elective repeat Caesarean deliveries. In 1991, 23.5% of more than 4 million births in the USA were Caesarean deliveries, and 35% of these were repeat elective procedure⁹.

The common complications of multiple repeat caesarean sections are adhesions, uterine dehiscence or rupture, placentation abnormalities which result in increased operative time, increased blood loss, blood transfusion requirements, SICU requirement and increased hospital stay. The rate of these complications may range from 4.3 to 12.5%^{10,11}. Also Intraperitoneal adhesions have shown to have an incidence of 5.5% to 42.5%.¹²

The results of our study demonstrated that as compared to previous one and two caesarean sections, higher order repeat caesarean sections have increased complication rates and more difficulties encountered during surgery. In the largest previously reported cohort of repeat cesarean deliveries, including 3,191 cases from Saudi Arabia (1,585 with 3 or more cesarean deliveries), Makoha and colleagues also noted increased maternal morbidity, including

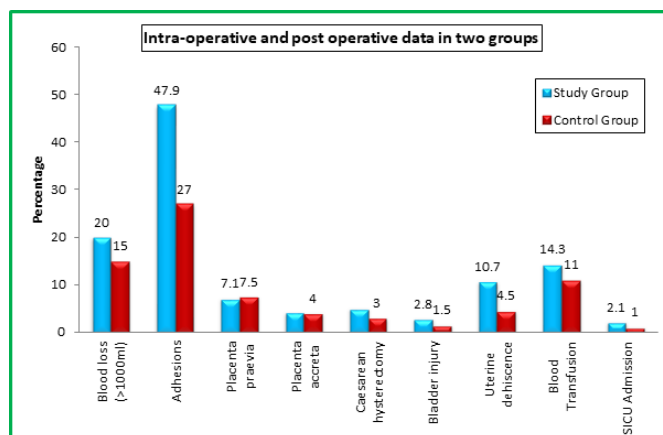


FIGURE 1:

placenta previa, placenta accreta, hysterectomy, adhesions, bladder injury, postoperative haemoglobin deficit, and need for blood transfusion with increasing number of caesarean deliveries¹³.

Because of these complications, patients with multiple repeat caesareans are considered as high risk requiring treatment in tertiary care setting. The two most dreaded complications of multiple repeat caesareans leading to increased maternal and fetal morbidity and mortality are uterine rupture and placenta accreta.

Adhesions were found to be increased in higher order repeat caesarean sections, the difference being statistically significant. This higher incidence of severe adhesion in the study group is expected as dense adhesion would tend to result from repeated assault on abdominal wall, with increased chances of post-operative infection. They also cause an increased risk to the patient by prolonging the operative time and by increasing the risk of injury to adjacent organs, like bladder and bowel and sometimes cause difficulty in delivery of the baby. In the study group, adhesions were found in 47.86% cases as compared to 27% cases in control group with a p value of <0.001. Adhesions were also found in increased rates in study group (58%) as compared to control group (18.29%) in study by Ali Gedikbasi¹⁴.

Uterine rupture is the most significant and potentially catastrophic risk for both the patient and her fetus. Uterine rupture occurs both during labour or before onset of labour, complete rupture being more common during labour. Complete uterine rupture is

an obstetric emergency increasing both maternal and fetal morbidity and in extreme cases, can lead to fetal and even maternal death. The present study revealed uterine scar dehiscence in 10.7% of women who had multiple repeat cesarean sections compared with 4.5% in the control group. Kashoggi¹⁵ study on multiple repeat cesarean sections also reported increased rates of 6.7 % in study group and 2.8% in control group.

Next important and dreaded complication associated with repeat cesarean section are those of **abnormal placentation, placenta praevia and placenta accreta**. Placenta praevia is defined as placenta being partially or wholly in the lower uterine segment, placenta accreta or morbid adherent placenta is a condition in which placenta is adherent to myometrium. Placenta praevia and accreta are considered as high risks as they need surgical expertise, longer operation time, massive blood transfusion, may require bladder and bowel repair and cesarean hysterectomy. We found a similar rate of placenta praevia and accreta in both the groups (Incidence of Placenta praevia 7.1% in study and 7.5% in control group and accrete 4.2% and 4% in study and control group respectively). Kashoggi¹⁵ study also reported similar rates of placenta praevia and accreta among patients with multiple repeat cesarean sections. Other studies reveal slightly higher rates of placenta accreta and praevia in patients with higher order cesarean sections¹⁶.

Most common indication for an emergency hysterectomy in obstetrics is massive hemorrhage often due to placenta accreta or fresh uterine rupture and postoperative morbidity is 35-60% in these patients. In this study, Cesarean hysterectomy was done in 5% cases in study group and in 3% cases in control group. 5 cases of placenta accreta and 2 cases of complete uterine rupture in study group required cesarean hysterectomy whereas 5 cases of placenta accreta and 1 cases of complete uterine rupture require Cesarean hysterectomy. There was no major morbidity noted in patients who underwent hysterectomy.

5 | CONCLUSION

With trend of increasing primary cesarean and decreasing VBAC, multiple repeat caesareans will be more common in future days. Complications encountered in repeat caesareans are more frequent in higher order multiple caesarean sections. In our study, adhesions and uterine rupture were found in higher rates in higher order repeat caesarean sections. Placenta praevia and accrete were reported in almost equal incidence in both the groups. In conclusion, the rate of Caesarean sections and therefore, multiple repeat caesarean sections will continue to increase. Multiple repeated cesarean sections will increase the risks of operative complications and poor perinatal outcomes. Patients must be encouraged to undergo tubal ligation at third or fourth caesareans. Women should be counselled regarding the progressive increase in the risk for morbidity with repeat cesarean deliveries and encouraged to undergo tubal ligation at third or fourth caesarean section.

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