

A study on risk factors & maternal outcome of Relaparotomy after Caesarean section- A prospective observational study in a tertiary care hospital in West Bengal.

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Abstract :

Introduction : Caesarean section (CS) is the most common obstetric surgery. Despite improving facilities, it is still associated with risks and potential complications, often requiring relaparotomy.

Aims & objectives : To identify the risk factors such as indication of relaparotomy, measures taken for management and to assess the maternal outcome in a tertiary care centre.

Materials & methods : A prospective observational study, was conducted in the department of Obstetrics & Gynaecology, Nil Ratan Sircar Medical College & Hospital, Kolkata, from May'2015 to April'2016. Twenty-four women confined by CS and within 6 wks postpartum and required relaparotomy were included in our study. Demographic characteristics, indication for CS, indication for relaparotomy, operative findings, intervention, blood transfusion, ICU admission, maternal outcome noted. Using SPSS software statistical analysis was done.

Results: A total of 24 women required relaparotomy. 66.6% had outside delivery and 87.5% had emergency CS. Previous CS (25%) & foetal distress (25%) were common indications for primary CS. Abdominal distension (75%) commonest presentation. Suspected intraperitoneal hemorrhage (58.3%), atonic PPH (12.5%), rectus sheath hematoma (12.5%) were the indications for relaparotomy. On relaparotomy 58.3% had hemoperitoneum, 25% had rectus sheath hematoma, 25% required hysterectomy. Almost every women required blood transfusion. 58.3% had uneventful recovery, 25% had secondary suturing. One death was there.

Conclusion: The incidence of relaparotomy after CS is 0.19% in our hospital. Exposure to CS is itself definite risk factor with complication requiring relaparotomy. Therefore limiting the rate & cautious approach towards performing CS decreases the risk of relaparotomy.

Keywords: Caesarean section, Relaparotomy, risk, management option.

Introduction:

The word 'Relaparotomy' (RL) is defined as an abdominal operation performed after an initial surgery within 60 days, and the decision is made upon criteria of general reaction to

surgical stress ^[1]. Now with a rising trend of CS in peripheral hospitals, the post-operative complications are also gradually increasing ^[2, 3].

With the improvement of operation technologies, anaesthesia coverage and blood transfusion facilities, safety of CS has increased considerably. In spite of improved perioperative conditions, the maternal mortality and morbidity are still a major concern for many obstetricians. Most of the time, RL is performed when the patient is in shock and unable to withstand the risk of anaesthesia and repeat surgery. So it is very difficult to take decision and requires a good clinical judgement ^[4].

Literature evaluating the indications for CS leading to relaparotomy is scant and insufficient to make a valid comparison about this important issue. N.R.S. MCH covers many of the peripheral referring districts as tertiary centre for delivery. With the increasing rate of CS in peripheral centres, the number of referred cases of post-caesarean mothers also increasing, requiring relaparotomy for different causes.

This prospective study will help to determine the factors and risk situations that are associated with RL after CS, so that they can be worked upon by all concerned departments as well as aid the obstetrician to be more vigilant and be cautious in the primary surgery to prevent the further secondary surgical intervention and its morbidities.

Aims & Objectives:

The study designed to identify the risk factors, such as indication of relaparotomy, measures taken for management and to assess the maternal outcome in a tertiary care centre.

Methodology:

This was an observational prospective study conducted at Nil Ratan Sirkar Medical Collage & Hospital, Kolkata, a tertiary hospital with 8440 annual deliveries (CS-4391). All patients who required relaparotomy during the period between May '2015 to April' 2016 and within 6 weeks of CS (done inside or outside this hospital) were included in our study. Relaparotomy requiring after 6 wks of CS was excluded.

Decision for RL was taken by on duty senior faculty of our hospital. Once decision was taken, the cases were enrolled in our study. Informed consent was taken from patient or guardian. Institutional ethical committee permission was obtained. Data such as age, parity, period of gestation, indication for C-Section and RL, the procedure used during RL, maternal outcome after second surgery were noted and filled in Excel and calculated the frequency and percentage for continuous variables using statistical package for social science (SPSS) software.

Results: From May '2015 to April' 2016, in NRS MCH, Kolkata, there were a total of 4209 caesarean section out of 8440 total deliveries for the period under the study and the CS rate was 49.80%. A total of 24 patients required RL following CS, of which 8 had CS in this institute and 16 were referred from the peripheral hospital. The incidence of RL following institutional CS was thus 0.19%.

Table 1: Sociodemographic characteristics and risk factors in the study population.

Characteristics	Frequency (N=24)	Percent
Age (years)		

< 20	2	8.30%
21-30	17	70.80%
>30	5	20.80%
Parity		
0	5	20.80%
1	11	45.80%
2	5	20.80%
3 or more	3	12.50%
Residence		
Rural	11	45.80%
Urban	13	54.10%
Primary CS		
Elective	3	12.50%
Emergency	21	87.50%
Hospital		
NRS	8	33.30%
Outside	16	66.60%
Gestational age		
<37 wks	4	16.60%
>37 wks	20	83.30%

The Primary CS conducted outside this hospital on an emergency basis were at risk.

Table 2: Indications for Caesarean section.

Indication for primary CS	Incidence	Percent
Previous one/two CS	6	25%
Foetal distress	6	25%
Post dated, induction failure	3	12.50%
Large fibroid in lower segment	1	4.10%
Infertility treatment (IVF)	1	4.10%
Non progress of labour	1	4.10%
Pre-eclampsia /Gestational hypertension	3	12.50%
Obstructed labour	1	4.10%
Twins	1	4.10%
Premature Rupture Of Membranes	1	4.10%

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Main indication for CS was history of previous CS, followed by foetal distress & pre eclampsia.

Table 3: Clinical presentation and indications for relaparotomy.

Clinical presentation		Incidence	Percent
	Abdominal distension	18	75%
	Atonic PPH	3	12.50%
	Secondary PPH	1	4.10%
	Bleeding from abdominal wound	2	8.30%
Indication for relaparotomy	Intra-peritoneal haemorrhage	14	58.30%
	PPH due to atonic uterus	3	12.50%
	PPH due to secondary haemorrhage	1	4.10%
	Rectus sheath hematoma	3	12.50%
	Bleeding from abdominal wound	1	4.10%
	Burst abdomen	1	4.10%
	Pelvic abscess	1	4.10%

Most of the women presented clinically with abdominal distension. The main indication of relaparotomy was intraperitoneal hemorrhage followed by rectus sheath hematoma and PPH due to atonic uterus.

Table 4: Relaparotomy findings and procedure done.

Relaparotomy findings	Incidence	Percent
1.Atonic uterus	3	12.50%
2.Uterine wound gaping, scar site bleeding, hemoperitoneum	4	16.60%
3.Hemoperitoneum	6	25%
4.Rectus sheath hematoma + hemoperitoneum	4	16.60%
5.Rectus sheath hematoma only	2	8.30%
6.Burst abdomen	1	4.10%
7.Gangrenous gut, oedematous pancreas	1	4.10%
8.Ligation site bleeding + hemoperitoneum	2	8.30%
9.Pelvic abscess	1	4.10%
Procedure during relaparotomy	Incidence	Percent
1.Subtotal hysterectomy	3	12.50%
2.Total hysterectomy	2	8.30%

3.Total hysterectomy + B/L IIAL	1	4.10%
4.B/L IIAL	3	12.50%
5.Resuturing of uterine wound + B/L IIAL	4	16.60%
6.Drainage of Rectus sheath hematoma, bleeding securing & peritoneal toileting	6	25%
7.Drainage of pus & peritoneal washing	1	4.10%
8.Repair of Anterior abdominal wall	1	4.10%
9.Gut resection and anastomosis	1	4.10%
10.Securing ligation site	2	8.30%

Hemoperitoneum due to gaping in uterine wound and diffuse bleeding from Rectus muscles were most common findings. Hysterectomy was major surgical procedure.

Table 5:Incidence of blood transfusion and outcome

		Incidence	Percent
Transfusion of blood	<3 units	7	29.10%
	3-7 units	7	29.10%
	>8 units	10	41.60%
Admission to	HDU	21	87.50%
	CCU	3	12.50%
Outcome	*Recovered uneventfully	14	58.30%
	*Recovered but post.op ARDS	1	4.10%
	*Recovered but AKI,need dialysis	2	8.30%
	*Recovered but wound infection-secondary suture	6	25%
	*Died	1	4.10%
Hospital stay	<10 days	7	29%
	11-20 days	16	66.66%
	21-30 days	1	4.10%

All the women required blood transfusion. Most of them recovered uneventfully by HDU care.

Discussion:

In India 40% delivery take place at home and 60% in health facility (SRS 2010). Incidence of CS in India is 9% (SRS 2010).Though CS is a lifesaving technique for both mother and infant, but it is a major abdominal operation that cause medical risk to a mother's health including infection (40%), haemorrhage(40%) and injury to other organs⁵. The overall

intra-operative complication rate was 14.8% and Post-operative morbidity rate was 35.7%. Fever (24.6%), blood loss (4%), haematoma(3.5%) & UTI(3%) were the frequent complications⁶.

There are very few large scale case series in the world literature regarding repeat laparotomy following CS. There is rising trend of CS specially in referral hospital. One such series from a teaching hospital in Ghana with a CS rate of 17%, showed a relaparotomy rate of 0.7% out of total 36100 deliveries⁷. Another study from India showed a relaparotomy rate of 0.33% out of 12967 CS and CS rate was 34.8% out of 37196 deliveries⁸. In our hospital CS rate was 49.8% during the study period and relaparotomy rate following CS was detected 0.19%. So the incidence of CS & relaparotomy were more or less similar to compare with those studies.

Majority of the patients underwent relaparotomy were primipara & in the age group of 21-30 years and is comparable to previous studies by Amad & Mir; Barkley^{9,10}. In our study women were mostly from urban area with middle class socio-economic condition & poor educational status. In the previous Indian study 34% cases were referral from periphery⁸, whereas it is 66.6% in our study.

The rate of Emergency CS was 95.5% among the women who latter needed relaparotomy⁷. Our study revealed the rate as 87.5% and are quite comparable to previous study. According to a study by M V Naveen Reddy¹¹, the commonest indication of primary CS was previous CS. Our study also revealed that the common indication of primary CS was previous CS & foetal distress.

Majority of women underwent relaparotomy within 24 hours of CS that is comparable to one previous study by Kessous R where 51.6% required relaparotomy within 24 hours¹². Among these women major indications were hemoperitoneum & rectus sheath hematoma. Our results are not comparable with the data of previous studies where PPH was the most common cause and it was 42.4% in previous Indian study in similar hospital set up 12 years ago, 51.8% in Dhaka Medical College study, 61% in Ghana study^{7,8}. These findings revealed rising rate of improved medical management of PPH with universal use of uterotonics in proper time reducing the need of surgical management.

Along with 12.5% of patients with Rectus sheath hematoma (RSH), 12.5% more cases who were previously thought to have hemoperitoneum found to have diffuse bleeding from Rectus muscles either from DIC or undiagnosed coagulopathy causing intraperitoneal collection, as in these cases the parietal peritoneum was left open and blood trickled down to peritoneal cavity and there was delayed diagnosis. So comprising these two groups total 25% women diagnosed to have RSH on laparotomy which was comparable to previous Indian study 27.3%⁷. Securing the bleeding point in undersurface of rectus sheath and rectus muscle before closing the rectus sheath can reduce the incidence of RSH. So special attention should be paid about hemostasis during closing the uterine incision and hemostasis to be checked before parietal peritoneum closure during CS .

In case of intraperitoneal hemorrhage , there was bleeding along the incision line specially at the corner due to loose knot and also loose suture¹³. In our study 16.6% of women found to have uterine wound gaping and scar site bleeding and needed resuturing with bilateral Internal iliac artery ligation. This rate is comparable to previous Indian study where 33.3% women needed resuturing of uterine wound.

CS done in 2nd stage of labour with impacted head could be technically difficult and was associated with increase trauma to the lower uterine segment and lateral extension of tear to involve uterine vessels, cervix, vagina, bladder and increased hemorrhage & infection¹⁴. Care must be taken to prevent extension of incision. In case of deeply engaged fetal head, pushing the fetal head up transvaginally could be useful¹⁵. All extension and laceration should be looked for in every difficult cases and carefully repaired before suturing the CS incision. In case of Placenta previa, bleeding from placental bed should be checked before suturing the uterine incision. Where hemostasis is doubtful, one must examine the vagina before closing the peritoneal cavity. In our study, it was evident that relaparotomy was done for PPH in 16.6% cases¹⁶. Conservative surgery in the form of ligation of bilateral uterine arteries & ovarian vessels, resuturing of uterine wound & uterine brace sutures were successful in 8.3% of cases and rest needed subtotal hysterectomy¹⁷. In cases of broad ligament hematoma with hemoperitoneum, extensive laceration of uterine angle was detected and needed hysterectomy either total or subtotal. Instead of hysterectomy, selective angiographic embolization with gel foam may have place in these cases¹⁸. However this facility was not available in our set up. So hysterectomy incidence was more in our study compare to Indian study (10.6%). Regarding maternal mortality which was quite high in patients who required relaparotomy following CS, 9.1% in African study and 12.1% in Indian study. In our study it is quite low, only one case. The patient had massive hemoperitoneum with pancreatitis with gangrenous gut loops.

Limitation of the study : As majority of the patients were referred from outside the hospital (68%), we had no data available regarding experience of surgeons and duration of primary CS of those referral cases.

Conclusion : This study highlighted the risk factors of relaparotomy after CS. Surgeons can use these data to identify women at risk beforehand and reduce the morbidity associated with relaparotomy.

The major risk factors were outside delivery and emergency CS for fetal distress, previous CS in labour & nonprogress of labour. On relaparotomy the leading causes identified were hemoperitoneum, rectus sheath hematoma & PPH. Hysterectomy was the major surgical procedure.

Regarding outcome, majority of patients had uneventful recovery depicting the well equipped management of HDU facility in our hospital. Only a small number of patients developed morbid conditions.

Finally, it can be concluded that exposure to CS is itself definitive risk factor with complications requiring relaparotomy. Therefore limiting the rate and cautious approach towards performing CS decreases the risk for relaparotomy.

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