

Study of Intraoperative Complications Associated with Repeat Cesarean Section & FetoMaternal Outcome at Tertiary Care Hospital

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Received: 18-02-2024 / Revised: 21-03-2024 / Accepted: 26-04-2024

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Conflict of interest: Nil

Abstract:

Background: Cesarean section (CS) is one of the most common obstetric procedures worldwide, and an increased rate of cesarean section has been observed in recent studies. Maternal mortality and morbidities associated with repeat cesarean section is a significant health problem worldwide. It can save the life of the mother and newborn but is also known to have the typical complications of any major surgery: hemorrhage, infection, venous thromboembolism and complications of anesthesia, sometimes leading to maternal death.

Aims and Objectives: To study the types and frequencies of intra-operative surgical complications and immediate maternal and perinatal outcomes associated with repeat cesarean sections, which will help identify the magnitude of problems and improve feto-maternal care.

Methodology: This is a prospective study conducted in the Department of Obstetrics and Gynaecology, in SV medical College during the period from October 2022 to June 2023. One hundred women with pregnancies randomly selected those meeting the inclusion. All women in this study who underwent a repeat cesarean section are divided into two groups based on the number of previous sections.

Results: The incidence of placenta previa and placenta accrete was 14.8% and 3.7%, respectively. Adhesions in women with previous one cesarean section (45.2%), dense adhesions in previous two or more cesarean sections (51.8%) than in women, TLUS was in 51.8% women, Scar Dehiscence in 33.3%. Excessive Blood Loss complication was in 33.3%. low birth weight, low Apgar, preterm delivery was more common in previous sections.

Conclusion: In conclusion, fetomaternal complications are increased in multiple repeat cesarean 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: Cesarean Section, Fetal Complications, Maternal Complications, Multiple Sections.

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Introduction

Cesarean section is defined as the birth of the fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (Hysterectomy). [1] Cesarean section (CS) is one of the most common obstetric procedures worldwide, and an increased rate of cesarean section has been observed in recent studies.

Maternal mortality and morbidities associated with repeat cesarean section is a significant health problem worldwide. It can save the life of the mother and newborn but is also known to have the typical complications of any major surgery: hemorrhage, infection, venous thromboembolism

and complications of anesthesia, sometimes leading to maternal death. Advances in medical care, antimicrobial and antithrombotic prophylaxis has improved the safety of CS. Incidence varies from 10% to 25% in developed countries. [2]

In India, the rate of cesarean section delivery has increased from 3 percent to 10 percent between 1992-93 and 2005-06 (IIPS, 2007), which is lower compared to some developing nations like Brazil and China. [1] Based on DLHS-3 data (2007-2008), the cesarean section delivery rate in India is 9.2 percent. Among the large states, the proportion of women who have undergone

cesarean deliveries is the highest in Kerala (31.8 percent) followed by Andhra Pradesh (29.3 percent) and Tamil Nadu (23.2%) and the lowest in Rajasthan and Jharkhand (4.2% in both the states). [3] The Cesarean section epidemic is a reason for immediate concern and deserves serious international attention since the complications rates are nevertheless far in excess of those with vaginal delivery. [4]

Recently there have been several reports from well-resourced countries on increased severe maternal morbidity and even mortality. The causes are unclear, but increased CSS, increased obesity and an increased proportion of women giving birth in advanced age are among the suspected.

After any laparotomy, it is relatively common to develop scar tissue, adhesions and bladder extension. CS holds no exception to this. Multiple CS is associated with more difficult surgeries with increased blood loss compared with a planned second CS. The risk of major complications increases with the number of previous CS. Scarring and adhesion formation is known to cause an increase in the major complication rates from 4.3 to 12.5% depending upon the number of previous cesarean section. Intraperitoneal adhesions have an incidence varying from 5.5% to 42.5%.^{4,5} Women with a history of CS have a higher risk of hemorrhage, placenta previa, uterine rupture, stillbirth in the following pregnancies, all this contributing to the maternal as well as fetal morbidity

Aims and Objectives

To study the types and frequencies of intra-operative surgical complications and immediate maternal and perinatal outcomes associated with repeat cesarean sections, which will help identify the magnitude of problems and improve foeto-maternal care.

Materials and Methods

Source of Study: This is a prospective study conducted in the Department of Obstetrics and Gynaecology, SV Medical College & Hospital, Tirupathi from the period between October 2022 to June 2023. One hundred women with pregnancies

randomly selected those meeting the inclusion. All women in this study who underwent a repeat cesarean section are divided into two groups based on the number of previous sections.

Group 1: Those with the previous one cesarean section.

Group 2: Those with two or more cesarean sections.

Inclusion Criteria: All previous cesarean section irrespective of their number of previous cesarean section and type. Women with previous cesarean section who have the history of another abdominal surgery.

Exclusion Criteria: All the first time cesarean irrespective of parity, multiple pregnancies, Polyhydramnios, Hypertension, Jaundice, Heart disease, Severe Anemia

The case records of the women are analyzed for the following parameters. Operative complications including adhesions, excessive blood loss during surgery, thin LUS, scar dehiscence, the incidence of placenta praevia, accrete, scar rupture, incidence of cesarean hysterectomy, bladder or bowel injury. The fetal outcome includes Birth weight, APGAR score at 5 minutes, preterm birth <37 weeks, number of admission into neonatal intensive care unit, number of stillbirths.

Statistical Analysis: Regarding data analysis, data were coded, checked, and entered into the Statistical Package for the Social Sciences version 22 (IBM Corp., Armonk, NY). Categorical variables were described using frequencies. Continuous variables were described using mean and standard deviation (SD). Chi-Square and independent t-tests were used to assess the association between the variables of the study and control groups. For all statistical tests, p-values ≤ 0.05 were considered significant.

Results and Observation

The study includes 100 pregnant women [n= 100]. All women in the study who underwent repeat Cesarean Section are divided into two groups based on the number of cesarean sections. Group 1: Those with one cesarean section [n= 73]. Group 2: Those with two or more cesarean sections [n= 27].

Table 1: No of previous C-sections

No of previous C-sections	Number	Percentage
1 CS	73	73%
2 or more CS	27	27%

Table 2: Types of Complications

Complications	Previous 1 LSCS (n=73)	Previous 2 LSCS (n=27)
Adhesion	33 (45.21)	26 (66.67)
Dense Adhesions	10 (13.70)	14 (51.85)
Thin Lower Uterine Segment	13 (17.81)	13 (48.15)
Scar dehiscence	6 (8.22)	9 (33.33)

Extension of uterine incision	8 (10.96)	9 (33.33)
Bladder Injury	0 (0.00)	1 (3.70)
Bowel Injury	0 (0.00)	0 (0.0)
Placenta previa	4 (5.47%)	4(14.81%)
Placenta accreta	0 (0.00)	1 (3.70)
Excess blood loss	7 (9.59)	9 (33.33)
Cesarean hysterectomy	0 (0.00)	1 (3.70)

Table 3: Age Wise Distribution of Previous Cesarean Section

Age Distribution	(Group 1)	(Group 2)
	No. of Patients	
< 20 yrs	2 (2.73%)	-
20 – 29 years	65 (89.04%)	18 (78.26%)
30 – 35 years	6 (8.23%)	5 (21.7%)

Adhesion: The most common complication was the presence of adhesions. Adhesions were more in women with previous two or more cesarean sections (group 2) (66.67%) than in women with previous one cesarean section (group 1) (45.21%) and the difference was statistically significant. (P value 0.0042)

Dense adhesions: Dense adhesions complication were more in women with previous two or more cesarean sections (51.85%) than in women with previous one cesarean section (13.7%), and the difference was statistically significant. (P <0.01)

Thin Lower uterine segment (TLUS): Thin Lower Uterine Segment complication was high in women with previous two or more cesarean section (48.15%) and women with previous one cesarean sections (17.81%), and the difference was statistically significant. (P <0.01)

Scar Dehiscence: Scar Dehiscence complication was high in women with previous two or more cesarean sections (33.3%) than in women with previous one cesarean section (8.2%), and the difference was statistically significant. (P <0.05)

Extension of uterine incision: Extension of uterine incision was observed more in women with previous two or more cesarean sections (33.33%) and then women with previous one cesarean section (10.96%) and the difference was statistically significant. (P <0.03).

Placenta Previa: Placenta Previa complication was more in women with previous two, or more cesarean sections (14.81%) than women with previous one cesarean section (5.47%) and the difference was statistically not significant. (P <0.09).

Placenta accrete: There was no placenta accrete observed in one woman with previous two or more cesarean sections, and one case (3.7%) seen in women with previous one cesarean section, and the difference was statistically not significant.

Excessive Blood Loss: Excessive Blood Loss complication was high in women with previous two or more cesarean sections (33.3%) than in women with previous one cesarean section (9.59%), and the difference was statistically significant. (P <0.05)

Cesarean Hysterectomy: Cesarean Hysterectomy in one woman with previous two or more cesarean sections (3.7%) and no Cesarean Hysterectomy in one woman with previous one cesarean section (0%) and the difference was statistically not significant.

Bladder Injury: The bladder Injury complication observed in one woman (3.7%) with previous two or more cesarean sections and no case seen in women with previous one cesarean section.

Bowel Injury: There was no Bowel Injury complication was observed in one woman with previous two or more cesarean sections and in women with previous one cesarean section, and the difference was statistically not significant.

Preterm Labour: Preterm Labor was high in women with previous two or more cesarean sections (22.2%) than in women with previous one cesarean section (17.8%), and the difference was statistically not significant. (P <0.621)

Low Birth Weight: Low Birth Weight babies (<2.5KG) were more in women with previous two or more cesarean sections (25.92%) than in women with previous one cesarean section (17.08%), and the difference was statistically significant. (P <0.05)

APGAR: 10% of babies had APGAR score <7 at 5th minute of birth in group 2, and 6% of babies had APGAR score <7 at 5th minute of birth in group 2, and the difference was statistically significant. They subsequently admitted in NICU. (P <0.093)

NICU admission: There are 10% of babies in group 1, and 22 % in group 2 required ICU admissions, and its difference was not statistically significant. P >0.05

Discussion

There is widespread concern about the increasing proportion of births by cesarean section. Increasing rates of the primary cesarean section have led to an increased percentage of women with a history of prior cesarean delivery.

Prior cesarean delivery will make necessary awareness of the potential complications that are associated with repeat cesarean delivery. Multiple cesarean sections predispose to an increased risk of intraoperative complications like scar dehiscence, uterine rupture, severe intra-peritoneal adhesions, significant hemorrhage, placenta praevia, placenta accrete, bladder injury, and hysterectomy.

Data regarding maternal complications during repeat cesarean section is of utmost importance to counsel women before undertaking a trial of labor or performing a planned repeat cesarean section. Also, knowledge regarding complications is important for considering tubal ligation, a permanent birth control method after repeat cesarean section, which will prevent further unwanted pregnancy and its associated complications.

Age: In our study, the mean age for women with previous two or more cesarean sections was 28.5 ± 4.5 years in group 2 and 25.5 ± 3.5 years in group 1, respectively. In a similar type of study by Kushboo et al., [5] showed the mean age of the study subjects was 26.94 years. In a study by Wuttikonsammakit P et al [6] showed the mean age for 140 women with previous two or more cesarean sections was 33.4 ± 4.7 .

Adhesions: In our study, dense adhesions complication were more in women with previous two or more cesarean sections (51.8%) than in women with previous one cesarean section (13.7%). Dense adhesions may lead to other complications like excessive bleeding, organ injury, difficulty and delay in delivery of a baby, and also long term complications like chronic pelvic pain etc. In a study conducted by Farkund, showed that incidence of complications was more in women with two previous cesarean sections, were in the most common complications was dense adhesions (35.5%). [7]

Results observed in a study by Kushboo et al. demonstrate that 35% of adhesions found in repeat cesarean sections and no incidence of adhesion in one cesarean section women. Nazaneen S et al [8] reported adhesions in 34.76%, dense adhesions in 12%, Anagha et al [9] reported in 39.99%, Singh S et al. 26.92% (21 in 78 cases). Several studies reported that the increasing number of cesarean sections increase the adhesion rate.

Thin Lower uterine segment (TLUS): Despite the advantages associated with the lower segment CS

scar, such scars are still relatively associated with poor healing. In our study, Thin Lower Uterine Segment complications were high in women with previous two or more cesarean section (48.15%) and women with previous one cesarean sections (17.81%), and the difference was statistically significant.

Juntunen and colleagues reported a significantly higher percentage of thin (<2 mm) lower uterine segment in patients undergoing their 4th to 10th CS (study group) compared to those having their 1st, 2nd, or 3rd CD (control; OR, 60.4; CI, 18.4-198.3). [10]

The complication rate of repeat CS in our study was 45%. The complications included adhesions, thin LUS, the extension of uterine incision, and placenta previa/accrete, scar dehiscence, and bladder injury in the repeat CS group. In a study by Joseph et al. the complication rate was 46% including adhesions (34%), thin LUS (17%), the extension of the uterine incision (3%), postpartum hemorrhage (5%), placenta previa (3%) and placenta accrete (2%). In a study by Farkhundah et al., the overall complication rate was 52.23%.

The major complications of repeat CS include adherence, placenta accrete, and intraoperative complications such as bladder or bowel injury. Unfortunately, there are no guidelines regarding the maximum number of Cesarean sections a woman may undergo before she risks having severe complications. Tulandi et al., Silver et al., Kaplanoglu et al., [11]

Scar Dehiscence:

In our study, scar dehiscence complications were observed in 33% in women with previous two or more cesarean sections and 8.2% in women with previous one cesarean section. Whereas another study, the risk of scar dehiscence was 3.33% in women with repeat cesarean section. [Nargis et al.] [12]

Whereas in another study, the incidence of scar dehiscence was found to be successively increased with the increasing number of CS [Shumaila et al.] [13] Qublan HS et al [14] study identified that scar dehiscence in 0.8% in previous two or more cesarean sections in their research on multiple repeat cesarean sections approximately similar to the present study where scar dehiscence was seen in 1 out of 102(0.98%) patients.

Placenta previa: The incidence of placenta previa was 14.81% in women with previous two or more cesarean sections and 5.47% in women with previous one cesarean section. Similar observations were also made by Joseph et al. and Waheed et al. [2] According to a study by Getahun et al., the risk of placenta previa was 0.68% compared to vaginal delivery (0.3%).¹⁵ A similar type of study

conducted by Mustafa et al. showed that 8.3% of the incidence of placenta previa observed in group 1 and 5.1% of the incidence of placenta previa observed in group 2 respectively, without significant difference.

Placenta accrete: In our study, placenta accreta noticed 3.7% in one woman with previous two or more cesarean sections and not in one cesarean section. Nazaneen S et al. reported that placenta accrete 2.46%, Singh S et al. reported 3% and 0.5% respectively. [8]

Similarly, various studies have also reported no association between placenta accreta and the number of CS. [Kaplanoglu et al., [11] Hershkowitz et al. [16], Gasim et al. [17]

Scar Dehiscence: In our study, scar dehiscence complications were observed in 33% in women with previous two or more cesarean sections and 8.2% in women with previous one cesarean section. Whereas another study, the risk of scar dehiscence was 3.33% in women with repeat cesarean section. [Nargis et al.] [12] Qublan HS et al [14] study identified that scar dehiscence in 0.8% in previous two or more cesarean sections in their study on multiple repeat cesarean sections approximately similar to the present study where scar dehiscence was seen in 1 out of 102(0.98%) patients.

Cesarean hysterectomy: In our study, the incidence of cesarean hysterectomy was 3.7% in a woman with previous two or more cesarean sections, which is less when compared to most of the other studies. [Rashid et al., Sobande et al., Nisenblat et al.] [18,19,20]

Previous studies were also showed no significant increase in the prices of cesarean hysterectomy as the number of cesarean sections increased. [Rashid et al., [18] Sobande et al., [19] Nisenblat et al. [20], whereas some studies recorded that an increasing number of cesarean sections are associated with an increased risk for hysterectomy. Erez et al [21], Silver et al [22]

Excessive Blood loss: In our study, blood loss was seen in 33.3% women with previous two or more cesarean sections and 9.59% in women with previous one cesarean section. In a previous study, blood loss increased with the increasing number of cesarean sections. [Rouse DJ et al.]. [23] whereas, in another study, lower-order cesarean sections significantly increased the need for transfusion [Gedikbasi et al.] [24]

Bladder injury: In our study, bladder injury recorded in one case (3.7%) with previous two or more LSCS and it may be due to severe adhesions between bladder and uterus associated with placenta accretes. In a study by Puja Banik et al., [25] bladder injury and subsequent repair were found in 1% patient, and studies have observed the

occurrence of the same in 0.09% to 5.6% intraoperatively in 2 or more cesarean sections.

Bowel injury: In our present study, there was no case with bowel injury recorded in both cases and because of no dense adhesions between the bowel and anterior abdominal wall in women with previous LSCS. Whereas in another study, peripheral organ damage correlated with an increasing number of cesarean sections. Kaplanoglu et al. [11]

Extension of uterine incision: In our study, extension of uterine incision was observed 33.33 in women with previous two or more cesarean sections (%) and 10.96% in women with previous one cesarean section and the difference was statistically significant. Whereas a study by Kushboo et al., showed vice-versa.

Preterm labor: In our study, preterm cesarean sections were performed in 22.2% cases in women with previous two or more cesarean sections and 17.8% in women with previous one cesarean section. Most of them were below 35 weeks of gestation period. In the study by Chiniwar et al. revealed that preterm CS is done for 11 cases. Whereas by the study of Nazaneen S Et al., preterm C S was done in 18.15%, due to patients admitted with emergency complaints like preterm labor pains, PROM, and scar tenderness. Singh S et al. reported 8% preterm CS.

APGAR score: In our study, 13.04% of babies had APGAR score <7 at 5th minute of birth in cases in women with previous two or more cesarean sections and 6.84% of babies had APGAR score <7 at 5th minute of birth in cases in women with previous one cesarean section and there was no difference in Apgar scores, and they need for admission to NICU among the two groups. Akanksha N et al. reported perinatal morbidity requiring NICU admissions for 6.4%.

Stillbirth: There was no case of stillbirths in our study. A study by Puja Banik et al. also demonstrates that their case was no case of stillbirth in the study similar to study Nazneen et al. 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.

In a study in the UK, depicted that neonates of mothers having multiple repeat cesarean sections were significantly high likely to be born before 37 gestational weeks. [Uygun et al.] [26]

NICU admission: There are 10.95% of babies in group 1, and 22.22% in group 2 required ICU admissions, and its difference was statistically significant.

Low Birth Weight: Low Birth Weight babies (<2.5KG) were more in women with previous two or more cesarean sections (25.92%) than in women with previous one cesarean section (17.08%), and the difference was statistically significant.

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