



A Cross - Sectional Study of Fetomaternal Outcome and Intrapartum Complications in Women with Previous Caesarean Section

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Abstract

Introduction: Caesarean section is defined as the birth of fetus via laparotomy and then hysterotomy. The rate of caesarean section is increased worldwide due to changes in maternal characteristics, professional practice style, economic, social and cultural trends giving the women, an obstetrical status of “previous caesarean section”.

Materials and methods: It is a cross – sectional study, conducted among 260 pregnant women with previous LSCS admitted in department of Obstetrics and Gynaecology at Sri Siddhartha medical college and hospital, tumkur from APRIL 2023 TO SEPTEMBER 2024. The intrapartum complications and fetomaternal outcome of the participants were noted.

Results: Out of 260 cases studied, 220 cases had one and 40 cases had two previous LSCS. More complications were noted in previous 2 LSCS, most

common being adhesions (29 out of 40 cases; 72.5%) (p<0.001), increased operative time (23 out of 40 cases; 57.5%) (p<0.001), PPH (8 out of 40 cases; 20%) (p - 0.001), uterine rupture occurred in (3 out of 40 cases; 7.50%) (p<0.001), caesarean hysterectomy (1 out of 40 cases; 2.50%) (p=0.019) which were statistically significant.

Though majority of babies had an APGAR 9 at 5min, irrespective of the number of previous LSCS, indicative of less adverse fetal outcome. Babies born to previous 2 LSCS had more NICU admission (12 out of 40; cases 30.0%) (p=0.002), sepsis (8 out of 40 cases; 20.0%) (p=0.001), respiratory distress (12 out of 40 cases; 30.0%) (p=0.001) which were statistically significant.

Conclusion: More complications were noted in women with previous 2 CS. The best technique to reduce the multiple potential risks of repeat CS is to reduce rates of primary C-Section whenever possible.

Keywords: Previous LSCS, uterine rupture, intra abdominal adhesions, NICU, APGAR score.

Introduction

Caesarean section, one of the most common surgical procedures worldwide, has significantly contributed to improving maternal and neonatal outcomes in situations of obstetric emergencies. However, with rising caesarean rates globally, concerns about the long-term consequences for subsequent pregnancies have also grown. Women with previous caesarean deliveries face unique challenges during subsequent pregnancies, which necessitates a deeper understanding of the associated risks and outcomes.¹

The risk profile for women with previous caesarean sections differs from those with unscarred uteri. Uterine rupture, a rare but potentially life-threatening complication, remains a critical concern during labor and

delivery in these women. Other complications, such as abnormal placentation, postpartum hemorrhage, and infections, also contribute to the complexity of managing such pregnancies.²

Fetal outcomes are equally impacted by prior caesarean deliveries. Neonatal risks such as preterm delivery, low birth weight, and respiratory distress syndrome are often higher in these cases. Additionally, challenges during labor, including fetal distress, necessitate close monitoring and timely interventions to ensure favorable neonatal outcomes.³

Current advancements in obstetric care, including improved surgical techniques and prenatal monitoring, have contributed to better management of pregnancies in women with a history of caesarean section. However, further research is needed to refine clinical guidelines and practices to achieve optimal outcomes while reducing the risks associated with intrapartum complications.^{4,5}

This study aims to provide a comprehensive analysis of fetomaternal outcomes and intrapartum complications in women with previous caesarean sections. By focusing on maternal and fetal outcomes as well as the occurrence of complications during labor, the study seeks to contribute valuable insights to enhance clinical decision-making and improve care for this high-risk population.

Aim

To study the fetomaternal outcome and intrapartum complications in women with previous caesarean section.

Objectives

1. To assess the intrapartum complications in women with previous caesarean section.
2. To assess the maternal outcome in women with previous caesarean section.

3. To assess fetal outcome in women with previous caesarean section.

Materials and Methods

A cross – sectional study, conducted among 260 pregnant women with previous LSCS admitted in department of Obstetrics and Gynaecology at Sri Siddhartha medical college and hospital, tumkur from APRIL 2023 TO SEPTEMBER 2024. The intrapartum complications and fetomaternal outcome of the participants were noted. Data collection involved a structured format, including demographic details, obstetric history, clinical findings, and outcome parameters. Maternal and neonatal outcomes were recorded during the hospital stay, using electronic medical records and standardized data sheets. Data accuracy was ensured through double checking by trained personnel. Key information, such as mode of delivery, operative findings, and postpartum complications, was documented systematically.

Inclusion Criteria

- Women with previous caesarean section from 36 weeks of gestation to term gestation admitted to OBG department.
- Patient giving informed consent.

Exclusion Criteria

- Women with multiple pregnancy
- Women who has undergone more than previous 2 LSCS
- Women, with history of previous abdominal surgeries other than caesarean section.
- Women with other maternal medical disorder.

Statistical Analysis

The data were presented using frequencies, percentages for categorical variables, means, and standard deviations for continuous variables using basic descriptive

statistics. All data analysis were performed using IBM SPSS Statistics for Windows, Version 20.0.

Results

A total of 260 women with previous LSCS were studied. Most were aged 26–30 years (45.4%), followed by <25 years (34.6%); only 1.5% were over 35. Non-consanguineous marriages predominated (90%), with 10% reporting second- or third-degree consanguinity. A majority (84.6%) had one prior LSCS, and 15.4% had two. Most were booked cases (83.1%), while 16.9% were referred. Regarding current delivery, 53.8% underwent emergency cesareans, and 46.2% had elective procedures as shown in table.1.

Intraperitoneal adhesions were the most common complication (26.9%), followed by scar dehiscence (15.0%) and placenta previa (4.2%). Bladder injury was rare but significant. These findings highlight the need for vigilant intraoperative monitoring and preparedness during repeat cesarean deliveries as shown in table 2.

Maternal complications were observed in a minority of cases: surgical site infections (6.5%), blood transfusions (5.0%), postpartum hemorrhage and HDU admissions (4.6% each), uterine rupture (1.2%), and caesarean hysterectomy (0.4%). Postpartum endometritis was not reported, indicating overall low maternal morbidity as shown in Graph 1.

Neonatal hyperbilirubinemia was the most common condition (33.5%), followed by NICU admission (14.2%) and respiratory distress (12.7%). Sepsis (7.3%), meconium aspiration, and low cord pH (3.5% each) were less frequent. Neonatal death was rare (1.2%), indicating generally favorable neonatal outcomes as shown in Graph 2.

The median age was 27 years (range: 20–40). Most deliveries occurred at 37–38 weeks, indicating near- or

full-term births. The median hospital stay was 5 days, with a few extended stays up to 25 days. Birth weights ranged from 1.7 to 4.0 kg, and median APGAR scores were 8 at 1 minute and 9 at 5 minutes, indicating overall good neonatal outcomes. Shown in Graph 3.

Multiple intrapartum complications were significantly associated with having two prior cesareans. Rates of placenta previa (p = 0.000) and scar dehiscence (p = 0.004) were notably higher, along with increased operative time, bladder injury, and adhesions—highlighting the greater surgical complexity and risks with repeat cesarean deliveries as shown in Table:3.

Women with two prior cesareans had significantly higher rates of blood transfusion (20.0% vs. 2.27%), postpartum hemorrhage (20.0% vs. 1.82%), and HDU

admissions (17.5% vs. 2.27%), all with p < 0.001. Surgical site infection rates were similar between groups (p = 0.336). These results highlight the elevated maternal risks associated with multiple cesarean deliveries as shown in table 4.

Several fetal outcomes were significantly more common in women with two previous cesareans, including NICU admission, low cord pH, sepsis, neonatal hyperbilirubinemia, and respiratory distress (p ≤ 0.05). These findings suggest increased neonatal risk with repeat cesareans. However, rates of meconium aspiration and neonatal death did not differ significantly between groups as shown in table 5.

Table: 1 Demographic distribution of study participants

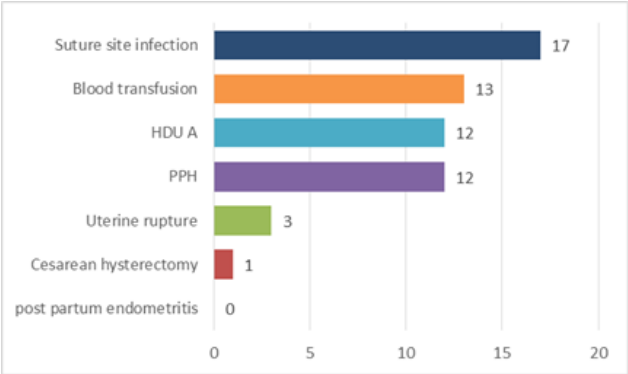
Variables		Frequency (n)	Percentage (%)
Maternal Age (Years)	<25	90	34.6
	26-30	118	45.4
	31-35	48	18.5
	>35	4	1.5
Consangunity	NCM	234	90.0
	2° CM	7	2.7
	3° CM	19	7.3
Previous Lscs	1 LSCS	220	84.6
	2 LSCS	40	15.4
Booked Status	Booked	216	83.1
	Referred	44	16.9
Type Of Lscs	Emergency	120	46.2
	Elective	140	53.8

Table 2: Distribution of intrapartum complications

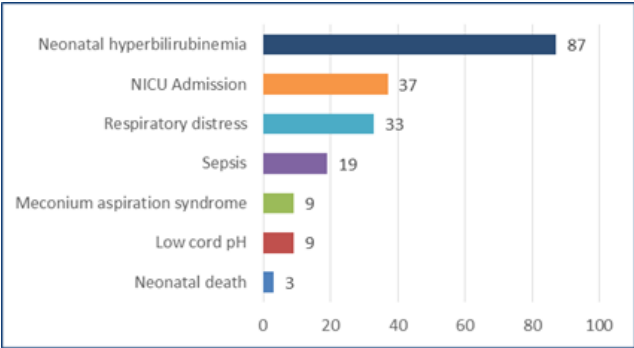
Intrapartum complications	Frequency (N)	Percentage (%)
Placenta Previa	11	4.2
Placenta Accreta	0	0.0

Scar Dehiscence	39	15.0
Increased operative time	37	14.2
Intestinal injury	0	0.0
Urinary bladder injury	5	1.9
Ureter injury	0	0.0
Intra peritoneal adhesions	70	26.9

Graph 1: Distribution of maternal outcome



Graph 2: Distribution of fetal outcome



Graph 3: Descriptive statistics of parameters

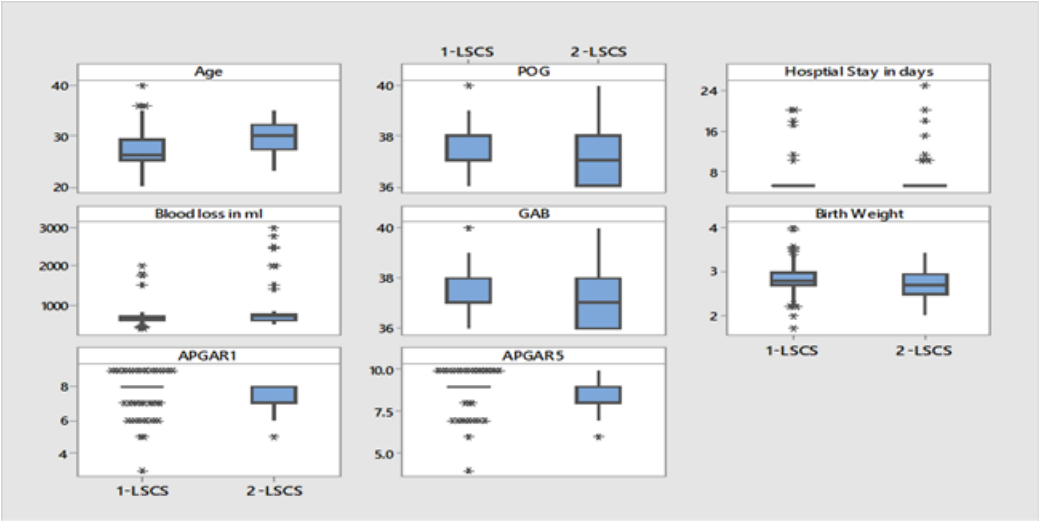


Table 3: Distribution of association of Intrapartum complications with previous cesarean

Factors	Previous Cesarean		Total	Chi-Square, P-value
	Previous 1 LSCS	Previous 2 LSCS		
Placenta Previa	5 (2.27%)	6 (15.00%)	11 (4.23%)	13.531, 0.000
Scar dehiscence	27 (12.27%)	12 (30.00%)	39 (15.00%)	8.342, 0.004
Increased operative time	14 (6.36%)	23 (57.50%)	37 (14.23%)	72.512, <0.001
Urinary bladder injury	2 (0.91%)	3 (7.50%)	5 (1.92%)	7.795, 0.005
Intraperitoneal adhesions	41 (18.64%)	29 (72.50%)	70 (26.92%)	49.911, <0.001

Table 4: Distribution of association of Maternal outcomes with previous cesarean

Factors	Previous Cesarean		Total	Chi-Square, P-value
	Previous 1 LSCS	Previous 2 LSCS		
Blood transfusion	5 (2.27%)	8 (20.00%)	13 (5.00%)	22.392, <0.001
Post partum hemorrhage	4 (1.82%)	8 (20.00%)	12 (4.62%)	25.415, <0.001
High density unit -Admission	5 (2.27%)	7 (17.50%)	12 (4.62%)	17.827, <0.001
Surgical site infection	13 (5.91%)	4 (10.00%)	17 (6.54%)	.927, 0.336
Cesarean hysterectomy	0 (0.00%)	1 (2.50%)	1 (0.38%)	5.521, 0.019
Uterine rupture	0 (0.00%)	3 (7.50%)	3 (1.15%)	16.693, <0.001

Table 5: Distribution of association of fetal outcome with previous cesarean

Factors	Previous Cesarean		Total	Chi-Square, P-value
	Previous 1 LSCS	Previous 2 LSCS		
NICU Admission	25 (11.36%)	12 (30.00%)	37 (14.23%)	9.631, 0.002
Low cord pH	4 (1.82%)	5 (12.50%)	9 (3.46%)	11.557, 0.001
Sepsis	11 (5.00%)	8 (20.00%)	19 (7.31%)	11.243, 0.001
Neonatal hyperbilirubinemia	68 (30.91%)	19 (47.50%)	87 (33.46%)	4.184, 0.041
Respiratory distress	21 (9.55%)	12 (30.00%)	33 (12.69%)	12.779, <0.001
Meconium aspiration syndrome	6 (2.73%)	3 (7.50%)	9 (3.46%)	2.307, 0.129
Neonatal death	2 (0.90%)	1 (2.50%)	3 (1.20%)	0.751, 0.385

Discussion

In this study of 260 women with prior LSCS, the majority were aged between 26 and 30 years, aligning with the typical reproductive age group. Most participants were in non-consanguineous marriages, and the majority had undergone only one previous cesarean,

indicating that a significant proportion were still within the early stages of repeat surgical deliveries. The high rate of booked cases (83.1%) reflects satisfactory antenatal coverage, though the notable referral rate (16.9%) suggests ongoing gaps in early identification and management of high-risk pregnancies. Interestingly,

K. Gupta et al. (2019) ⁽⁶⁾ underscored that late referrals often resulted in cesareans at full dilatation, significantly raising maternal and neonatal morbidity. Lan Wang et al. (2019) ⁽⁷⁾ similarly highlighted how prior cesarean could affect fertility, suggesting that prompt and adequate antenatal visits might help mitigate subsequent reproductive complications. Emergency cesarean deliveries (53.8%) slightly outnumbered elective ones, likely due to emergent complications during labor in women with prior scars. Banik et al. (2018) ⁽⁸⁾ found that 68.6% of their participants with multiple prior scars were primarily elective, suggesting a trend toward more planned surgeries to reduce acute complications. In our study, the slight predominance of emergency cases may indicate that certain complications, such as non-reassuring fetal heart tracings or labor arrest disorders, drove surgical intervention. Gupta et al. (2019) ⁽⁶⁾ highlighted that emergency cesareans at full dilatation are associated with higher maternal morbidity (hematuria 41%, uterine incision extension 28%).

Intrapartum complications were prominent, particularly intraperitoneal adhesions (26.9%) and scar dehiscence (15%), both of which are recognized sequelae of repeat cesarean sections. Placenta previa, though less frequent (4.2%), remains clinically significant due to its potential for hemorrhagic complications. Bladder injury, while rare, underscores the technical difficulty of operating in scarred pelvic anatomy. These findings stress the importance of careful surgical planning, intraoperative vigilance, and skilled obstetric care to manage the increased risks associated with repeat cesarean sections. Iyoke et al. (2014) ⁽⁹⁾ documented a 5.0% rate of intrapartum hemorrhage and equal rates for placenta previa, indicating that scarring might predispose to abnormal placental implantation. Shaheen et al. (2014)

⁽¹⁰⁾ and Banik et al. (2018) ⁽⁸⁾ similarly found that scar dehiscence or adhesions were among the leading issues in repeat cesareans, especially in women with a less favorable pelvis or advanced gestational complications. Our investigation highlighted several maternal outcomes, including blood transfusion needs (5.0%), postpartum hemorrhage (4.6%), high-dependency unit admission (4.6%), and surgical site infection (6.5%). Notably, no cases of postpartum endometritis were reported, indicating a potential success of perioperative antibiotic prophylaxis. Iyoke et al. (2014) ⁽⁹⁾ noted postpartum hemorrhage in 5.0% of their participants, mirroring our 4.6%. K. Gupta et al. (2019) ⁽⁶⁾ likewise found a 35% rate of postpartum hemorrhage in cesareans done at full dilatation, a figure substantially higher than ours, perhaps reflecting different patient profiles. The absence of endometritis is a positive indicator, suggesting robust aseptic protocols, but the presence of other concerns—particularly hemorrhage—reinforces the importance of comprehensive postpartum surveillance and emergency preparedness.

Neonatal hyperbilirubinemia was the most common fetal issue, identified in 33.5% of newborns, followed by NICU admission at 14.2% and respiratory distress (12.7%). Sepsis (7.3%), low cord pH (3.5%), and meconium aspiration (3.5%) were less frequent, with fetal death at 1.2%. These results align with the heightened neonatal risks often seen in repeat cesarean deliveries. Mishra et al. (2014) ⁽¹¹⁾ reported that in their cohort of TOLAC, no newborn scored below 7 on the APGAR at 1 and 5 minutes, illustrating that controlled vaginal deliveries can yield favorable neonatal outcomes. Iyoke et al. (2014) ⁽⁹⁾, however, documented a higher incidence of newborn special care admissions, citing a relative risk of 2.5 for neonates of mothers with

prior cesareans compared to those with previous vaginal deliveries. Meanwhile, Banik et al. (2018) ⁽⁸⁾ noted a 3.9% NICU admission rate among neonates in multiple-cesarean pregnancies, suggesting that close prenatal monitoring mitigates some risks. Our higher 14.2% NICU figure might reflect a more heterogeneous population or slightly earlier gestational ages. Overall, while our incidence of serious neonatal outcomes like death (1.2%) and meconium aspiration (3.5%) is relatively low, consistent with successful perinatal interventions, conditions like neonatal jaundice and respiratory issues still necessitate vigilant observation in women with repeat cesareans.

The descriptive statistics reveal a median maternal age of 27 (IQR 25–30), and a median gestation around 38 weeks. The typical hospital stay was five days, though some cases extended to 25 days, likely reflecting complicated recoveries or additional postpartum interventions. Blood loss had a median of 600 mL but spanned from 380 to 3000 mL, underscoring that while many cesareans proceed with moderate bleeding, a subset can experience critical hemorrhage.

Multiple intrapartum complications were significantly higher among those with two previous cesareans, including placenta previa (15.0% vs. 2.27%), scar dehiscence (30.0% vs. 12.27%), and intraperitoneal adhesions (72.5% vs. 18.64%), with p-values <0.05. Similar findings were noted in a descriptive study conducted by shekhar Amale, et al. ⁽¹²⁾

Higher frequencies of severe maternal outcomes were noted among those with two previous cesareans: blood transfusions (20.0% vs. 2.27%), postpartum hemorrhage (20.0% vs. 1.82%), and HDU admission (17.5% vs. 2.27%), all with p-values <0.001. In a study by S.Narava et al ⁽¹³⁾ , similar findings were noted, like intra operative

complications and HDU-A ,PPH and blood transfusion and wound infection.

Fetal outcomes showed notable increases in NICU admission (30.0% vs. 11.36%, p=0.002), low cord pH (12.5% vs. 1.82%, p=0.001), sepsis (20.0% vs. 5.0%, p=0.001), hyperbilirubinemia (47.5% vs. 30.91%, p=0.041), and respiratory distress (30.0% vs. 9.55%, p<0.001) among women with two scars. In a study by S.Narava, et al ⁽¹³⁾ similar findings were noted ,but in that study the results were not statistically significant.

Conclusion

The study underscores that maternal and neonatal complications rise with each additional cesarean, reinforcing the need to minimize unnecessary primary cesareans. Younger women should be counseled on safe delivery options, including VBAC where appropriate. The 16.9% referral rate highlights gaps in early risk identification, calling for improved referral systems and antenatal screening. Higher NICU admissions in repeat cesareans reflect the close link between maternal and neonatal health, emphasizing the need for strengthened neonatal support. While no cases of endometritis suggest effective infection control, a 6.5% rate of surgical site infection warrants ongoing vigilance. Booked patients had better outcomes than referred ones, supporting the importance of consistent antenatal care. Overall, the findings advocate for individualized, evidence-based care and strengthened interdepartmental coordination to improve outcomes in repeat cesarean cases.

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