

## **A Prospective Analysis of Lower Segment Cesarean Deliveries Conducted Before 34 Weeks of Gestation**

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### **Abstract**

**Background:** Preterm lower segment cesarean section (LSCS) before 34 weeks of gestation is often performed due to maternal or fetal indications such as preeclampsia, fetal distress, or preterm premature rupture of membranes (PPROM). Understanding the fetomaternal outcomes associated with this intervention is crucial for improving perinatal care.

**Objective:** This prospective study aims to evaluate the fetomaternal outcomes of LSCS performed before 34 weeks of gestation, analyzing maternal complications, neonatal morbidity, and mortality rates.

**Duration of Study-** 2.5 Years (January 2023 To May 2025)

**Methods:** A prospective analysis of medical records of pregnant women who underwent LSCS before 34 weeks was conducted. Data regarding maternal demographics,

indications for LSCS, intraoperative and postoperative complications, neonatal birth weight, Apgar scores, need for neonatal intensive care unit (NICU) admission, and perinatal mortality were collected and analyzed.

**Results:** The study observed that the most common indications for preterm LSCS were deranged doppler (43.5%), Severe preeclampsia (24.35%), and PPRM (21.7%). A total of 78 LSCS cases before 34 weeks of gestation were analyzed, yielding 79 neonates (including one twin pregnancy). The most common indication was deranged Doppler (44.1%), followed by severe preeclampsia (24.3%) and PPRM (23%). Of the 79 neonates, 37 (46.8%) weighed less than 1.5 kg and 42 (53.2%) weighed more than 1.5 kg. Overall, 57 babies (72.2%) survived, while 22 (27.8%) demised.

The most frequent causes of neonatal demise were respiratory distress syndrome (40.9%), sepsis (22.7%),

intraventricular hemorrhage (13.6%), necrotizing enterocolitis (13.6%), and extreme prematurity with low birth weight (9.1%).

**Conclusion:** Preterm LSCS before 34 weeks of gestation is associated with significant maternal and neonatal complications. Identifying high-risk cases and optimizing perinatal care can improve outcomes. Further prospective studies are recommended to refine management strategies and minimize morbidity.

**Keywords:** Preterm LSCS, Feto-maternal outcomes, Preterm birth, Neonatal morbidity, Maternal complications

### **Introduction**

A Lower Segment Cesarean Section (LSCS) before 34 weeks of pregnancy is a critical obstetric intervention performed when continuing the pregnancy poses significant risks to maternal or fetal health.

Preterm LSCS, particularly before 34 weeks of gestation, is often indicated in cases of severe preeclampsia, eclampsia, fetal distress, placenta previa, abruptio placentae, intrauterine growth restriction (IUGR), or maternal infections.<sup>1,2</sup>

Neonates born before 34 weeks face higher risks of respiratory distress syndrome (RDS), intraventricular hemorrhage, necrotizing enterocolitis, and long-term neurodevelopmental issues due to immature organ systems. Maternal complications, including postpartum hemorrhage, infections, and future placental abnormalities, also require careful consideration.

This study aims to explore that while performing a preterm cesarean section before 34 weeks of pregnancy it's essential to carefully evaluate the risks and benefits to ensure the best possible outcomes for the mother and the baby.<sup>3,4</sup>

### **Aim**

- To evaluate the maternal and neonatal outcomes associated with lower segment cesarean section performed before 34 weeks of gestation.

### **Objectives**

- To identify the common indications for LSCS before 34 weeks of gestation.
- To assess the intraoperative and postoperative maternal complications associated with preterm LSCS.
- To study the neonatal morbidity and mortality rates following preterm LSCS.
- To evaluate the need and duration of neonatal intensive care unit (NICU) admission after LSCS before 34 weeks.
- To evaluate the Cause of demise of neonates born by LSCS before 34 weeks of pregnancy.

### **Methods**

- Prospective Observational Study Was Carried Out In The Department Of Obstetrics And Gynaecology and NICU (Neonatal Intensive care unit) of Smt. Kashibai Navale Medical College And General Hospital, Narhe, Pune.
- **Duration of Study**-January 2023 to May 2025.
- **Sample size**-78
- Prior to the commencement of the study, approval was obtained from the Institutional Ethics Committee, and a structured proforma was developed for standardized data collection.

### **Inclusion Criteria**

- Patients Delivered By LSCS at or Before 34 Weeks of Pregnancy.
- Patients who had given consent for the study.

### **Exclusion Criteria**

- All Intrauterine Deaths at or Before 34 Weeks of Pregnancy Who Underwent LSCS.

## Study Approach and Data Collection

A structured proforma was used to record data. The proforma included the following:

### Maternal Parameters

- Parity
- Indication for LSCS
- Presence of comorbidities
- Intraoperative and postoperative complications

### Fetal Parameters

- Gestational age at delivery
- Birth weight
- APGAR scores at 1 and 5 minutes
- Duration of NICU stay
- Respiratory distress syndrome (RDS), sepsis, intraventricular hemorrhage (IVH), neonatal death
- Each patient was given a serial number and entered into an Excel spreadsheet. Data were verified for completeness and accuracy.

### Data Analysis and Presentation

Data were entered into Microsoft Excel and analyzed using SPSS version [X].

Categorical variables (e.g., maternal complications, NICU admission) were expressed in frequencies and percentages.

Continuous variables (e.g., age, birth weight) were expressed as mean  $\pm$  standard deviation.

Comparative analysis was done using the Chi-square test for categorical data.

Tables were prepared to present demographic data, maternal indications, and fetal outcomes.

Graphs and charts were created using Excel/SPSS:

Bar charts for comparison of maternal complications.

Pie charts for fetal outcome distribution.

### Results

Out of 1897 total LSCS performed 78 were Preterm LSCS (4.1%)

The study analyzed 78 cases of lower segment cesarean section (LSCS) performed before 34 weeks of pregnancy. The most common indication was deranged doppler findings, observed in 43.5% (34 cases), with contributing factors including intrauterine growth restriction (IUGR) in 19 cases, mild pregnancy-induced hypertension (PIH) in 11 cases, and gestational diabetes mellitus (GDM) in 4 cases. Severe preeclampsia was the second most frequent indication, accounting for 24.35% (19 cases).

Preterm prelabour rupture of membranes (PPROM) was responsible for 21.7% (17 cases), with 10 cases due to previous LSCS, 6 cases involving primigravida with non-vertex presentation and 1 case of DCDA twin gestation where the first twin had a non-vertex presentation.

Other indications included placenta previa in 6.41% (5 cases) and abruptio placenta in 3.84% (3 cases). These findings highlight the major maternal and fetal conditions necessitating early LSCS, emphasizing the need for close monitoring in high-risk pregnancies.

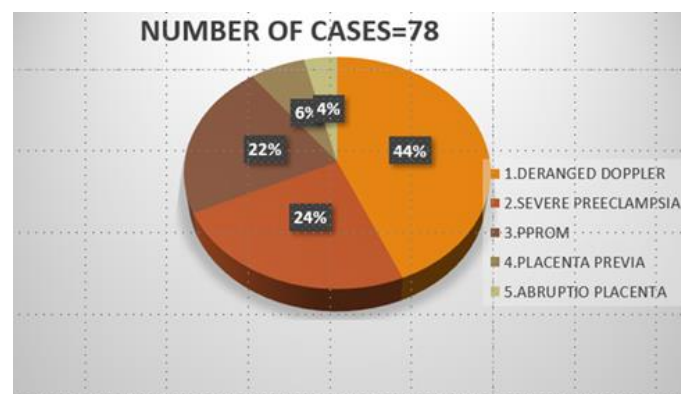


Figure 1: Distribution of number of cases

### Indications of LSCS Before 34 Weeks of Pregnancy

Table 1: Indications of LSCS before 34 Weeks of Pregnancy

Indication of LSCS	Number of Cases (n)	Percentage of Cases
1)Deranged Doppler with:	34	43.5%
- IUGR	19	
- Oligohydraminos	11	
- GDM	4	
2)Severe Preeclampsia	19	24.35%
3)PPROM	17	21.7%
A) Due to previous LSCS	10	
B) Primigravida with non-vertex presentation	6	
C) DCDA twin gestation with first twin in non-vertex presentation	1	
4)Placenta Previa	5	6.41%
5)Abruptio Placenta	3	3.84%

The Chi-square statistic is 39.95, and the p-value is  $4.44 \times 10^{-8}$ , which is highly significant. There is a statistically significant difference in the distribution of indications for LSCS before 34 weeks. This means that certain indications (like Deranged Doppler findings) occur much more frequently than others, and the variation is not due to random chance.

### Obstetric History



Figure 2: Obstetric history of patients delivered before 34 weeks of pregnancy.

The figure illustrates the distribution of patients based on various obstetric histories. The largest group comprises primigravida women (42 cases), followed by multigravida women (36 cases). Among the multigravida, 24 (66.6%) had previous lower segment cesarean sections (LSCS), indicating a high prevalence of cesarean delivery. Preterm births were reported in 14 cases (38.88%), and 12 cases (33.3%) had an interpregnancy interval of less than 12 months, which may be a risk factor for adverse outcomes. Additionally, 9 cases (25%) had a history of previous abortion. This data highlights important reproductive factors that may influence current pregnancy outcomes or clinical decisions.

### Neonatal outcome of LSCS Before 34 Weeks -

Table 2: Neonatal outcome of LSCS Before 34 Weeks of Pregnancy.

Indication of LSCS Before 34 Weeks of Pregnancy	Babies <1.5 kg	Babies >1.5 kg	Babies Alive	Babies Demised (<1.5kg + >1.5kg =Total babies demised )
1. Deranged Doppler	15 (44.1%)	19 (55.9%)	27(79.4%)	4+3=7 (20.6%)

2. Severe Preeclampsia	9 (47.3%)	10 (52.7%)	11 (57.9%)	5+3=8 (42.1%)
3. PPROM	9 (50%)	9 (50%)	13 (72.2%)	4+1+5 (27.8%)
4. Placenta Previa	2 (40%)	3 (60%)	4 (80%)	1+0=1 (20%)
5. Abruptio Placenta	2 (66.7%)	1 (33.3%)	2 (66.7%)	1+0=1 (33.3%)
Total	37 (46.8%)	42 (53.2%)	57 (72.2%)	22 (27.8%)

Chi-square statistic  $\approx 4.73$

Approximate p-value  $\approx 0.316$

The p-value  $\approx 0.316$  indicates no statistically significant association between LSCS indication and baby outcome (Alive vs Demised), at the conventional 0.05 level.

Total 78 cases of LSCS before 34 weeks of pregnancy of which 1 was DCDA twin pregnancy, so total babies were 79 as shown in table 2.

Table 3: Cause of demise of babies born by LSCS before 34 weeks of pregnancy.

Cause of Demise	Number of babies (n)
Respiratory Distress Syndrome (RDS)	9 (41%)
Sepsis	5 (22%)
Intraventricular Hemorrhage (IVH)	3 (14%)
Necrotizing Enterocolitis (NEC)	3 (14%)
Extreme Prematurity & Low Birth Weight	2 (10%)

**Neonatal Complications**

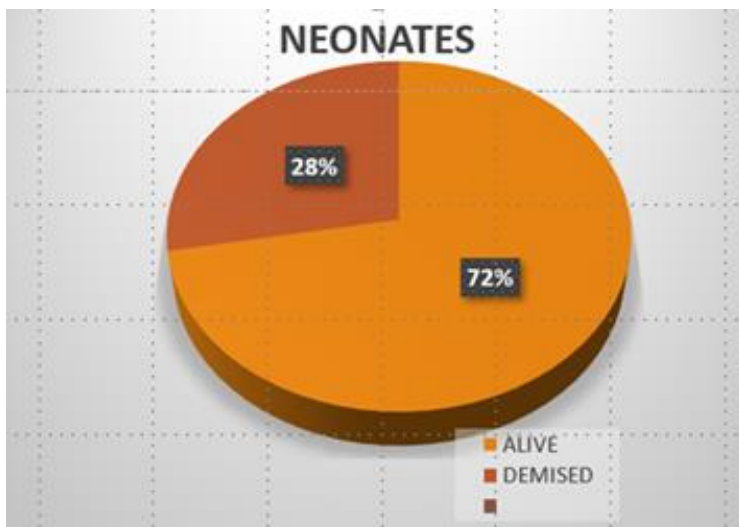


Figure 3: Neonatal complications.

**NICU Stay and Neonatal Death Data**

Table 4: NICU Stay and Neonatal Death Data

	<1.5 kg	>1.5 kg
1) Avg. Stay in NICU	31 days	19 days
2) Neonatal Death at	3.5 days	6.3 days

Table 5: Apgar score

Apgar Score	1-Minute (n)	5-Minute (n)	Remarks
0-3	10	4	Severe distress, high risk of resuscitation
4-6	25	15	Moderate distress, requires monitoring & intervention
7-10	44	60	Good condition, minimal intervention needed

**Maternal Complications – Intraoperative and Postoperative**

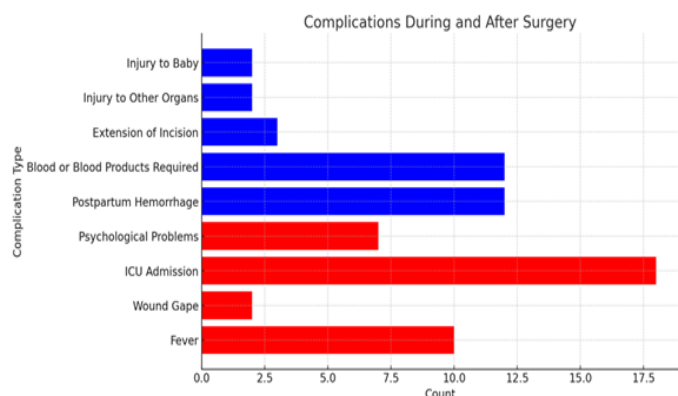


Figure 4: Complication during and after surgery.

- The bar chart titled "Complications During and After Surgery" presents various complications categorized based on their occurrence. The x-axis represents the count of occurrences, while the y-axis lists different types of complications. The bars are color-coded, with blue representing intraoperative complications and red representing postoperative complications.
- Among intraoperative complications, "Blood or Blood Products Required" and "Postpartum Hemorrhage" are the most frequently reported, indicating significant blood loss during surgery. Other intraoperative issues, such as "Extension of Incision", "Injury to Other Organs", and "Injury to Baby", have relatively lower occurrences.
- On the other hand, postoperative complications appear to be more frequent, with "ICU Admission" having the highest count, followed by "Fever" and "Psychological Problems". This suggests that post-surgical care and recovery present notable

challenges. "Wound Gap" is less frequently reported but still a notable complication.

- Overall, the chart highlights that while intraoperative complications primarily involve surgical precision and bleeding control, postoperative complications, particularly ICU admissions and fever, are more common and require critical post-surgical management.

**Discussion**

In the current study, the most frequent indication for lower segment cesarean section (LSCS) before 34 weeks of gestation was deranged Doppler findings, accounting for 43.5% of the cases. This suggests that abnormal fetal blood flow patterns, indicative of compromised placental function or fetal distress, played a critical role in the decision to intervene early. The use of Doppler ultrasonography has become an invaluable tool in modern obstetrics, especially in the management of high-risk pregnancies.<sup>5</sup> It allows for timely detection of intrauterine growth restriction (IUGR), placental insufficiency, and fetal hypoxia—conditions that, if left unmanaged, could result in poor perinatal outcomes. The high prevalence of Doppler abnormalities as an indication in our study underlines the growing reliance on fetal surveillance technologies in guiding clinical decisions for preterm deliveries.<sup>6,7</sup>

In comparison, severe preeclampsia was the second most common indication in our cohort, seen in 24.3% of cases. This aligns closely with findings by Ke Manga Reddy et al., who reported a 26.6% incidence of LSCS for severe preeclampsia.<sup>8</sup> Hypertensive disorders of pregnancy,

particularly preeclampsia, are well-known contributors to adverse maternal and fetal outcomes, including placental abruption, fetal growth restriction, and eclampsia. When maternal or fetal status begins to deteriorate in the setting of severe preeclampsia, early delivery—often by cesarean section—becomes necessary, even if it means intervening before term. These results reaffirm the ongoing burden of hypertensive complications in pregnancy and highlight the need for vigilant antenatal monitoring and timely referral.

Preterm prelabour rupture of membranes (PPROM) was another significant contributor in 21.7% of the cases in our study. This is slightly lower than the 25.1% reported

by Sureshbabu et al., yet still notable.<sup>9</sup> PPRM poses a major clinical challenge, as it increases the risk of intrauterine infections, cord prolapse, and placental abruption, all of which may necessitate expedited delivery. The findings from our research, along with previous studies, emphasize that while some indications like severe preeclampsia and PPRM remain consistently prevalent, there is an increasing trend toward early delivery due to technological advancements in fetal monitoring, such as Doppler studies. This evolution in practice reflects a more nuanced, individualized approach to managing high-risk pregnancies, prioritizing both maternal safety and fetal well-being.

Table 6: Comparison of Common Indications of LSCS before 34 Weeks of Pregnancy

Studies	Common indications of LSCS before 34 weeks of pregnancy	Percentage of Cases
1. Sureshbabu et al	PPROM	25.1%
2. Ke Manga Reddy et al	Severe Pre-eclampsia	26.6%
3. This Study	<ul style="list-style-type: none"> <li>▪ Deranged Doppler</li> <li>▪ Severe Preeclampsia</li> <li>▪ PPRM</li> </ul>	<p>43.5%</p> <p>24.3%</p> <p>21.7%</p>

**Conclusion**

The study identified key indications for lower segment cesarean section (LSCS) before 34 weeks of pregnancy. The most common indication was deranged Doppler findings associated with other comorbidities. Severe preeclampsia emerged as the leading cause for maternal ICU admission, highlighting its significant impact on maternal health.<sup>10,11</sup>

Regarding perinatal outcomes, placenta previa was associated with the most favorable prognosis, whereas severe preeclampsia was linked to poor perinatal outcomes.

These findings emphasize the importance of early detection and management of high-risk conditions in pregnancy to optimize both maternal and neonatal outcomes.<sup>12,13</sup>

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