A comparative study on maternal and fetal outcomes in emergency versus elective caesarean section

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ABSTRACT

Background: The incidence of caesarean section has progressively increased worldwide over the past few decades. Alongside this rise, the number of indications—many of them unnecessary—has also expanded, resulting in indiscriminate use. Caesarean section is performed as an emergency or elective procedure depending on maternal and fetal conditions. Evidence suggests that the risk of surgical complications is higher in emergency caesarean sections than in elective ones.
Materials and Methods: This retrospective study was conducted to evaluate maternal and fetal outcomes in elective versus emergency caesarean sections performed at our hospital from July 2024 to July 2025.
Results: Among 1,980 total deliveries, 1,158 were normal vaginal deliveries, 102 were instrumental, and 720 were caesarean sections. Of the caesarean deliveries, 350 were emergency and 370 were elective. Overall operative complications were observed in 85 cases (11.8%), with the majority occurring in the emergency group.
Conclusions: Elective caesarean sections are associated with fewer maternal and perinatal complications compared to emergency caesarean sections.
Keywords: Elective, Caesarean, emergency, maternal outcome, fetal

Introduction

Caesarean section (CS) is one of the most frequently performed major obstetric procedures worldwide, undertaken either electively or as an emergency. The World Health Organization (WHO) estimates that CS rates in developed countries should ideally range between 10–15% of all births.[1] An emergency caesarean section is defined as a CS performed within thirty minutes of decision-making when an immediate threat to the mother or fetus arises during labor or anytime after 28 weeks of gestation.[2] Like any major surgery, emergency CS carries significant risks,[3]

including immediate complications such as hemorrhage, shock, anesthetic hazards, infection, and thromboembolism. Late complications such as incisional hernia, intestinal obstruction due to adhesions, uterine scar rupture, and placental abnormalities in subsequent pregnancies are also well recognized. Approximately 10% of emergency CS cases experience complications.

A caesarean section involves the delivery of the fetus, membranes, and placenta through abdominal and uterine incisions, and it is the most commonly performed major surgical procedure globally.[4] The worldwide CS rate, currently around 15%, remains unevenly distributed. In India, the rate has risen substantially over the past two decades—from 2.9% in 1992–93, to 7.1% in 1998–99, and to 8.5% in 2005–06. According to the National Family Health Survey (NFHS-4, 2015–16), the CS rate increased to 17.2%, and in NFHS-5 (2019–20) it further escalated to 29.9%. Public health facilities accounted for 23.6% of CS deliveries, whereas private sectors contributed 79.2% during NFHS-5.[5]

This rapid three-fold rise in CS rates over the past 15 years has been noted globally as well. The WHO reports a substantial and continuous increase in CS use across countries, irrespective of economic development. Two key drivers of this trend include the rise in primary caesarean deliveries and the decline in vaginal birth after caesarean (VBAC). As CS rates rise, the number of women undergoing multiple repeat caesareans also increases—a scenario associated with significant maternal risks such as adhesions, obliterated uterovesical fold, lower-segment thinning, scar dehiscence, broad ligament hematomas, visceral injuries, uterine rupture, abnormal placentation, caesarean hysterectomy, and increased bleeding and transfusion requirements. Neonatal risks also rise, with babies delivered by multiple repeat CSs more likely to experience respiratory difficulties and require neonatal intensive care.

Several factors contribute to the rising global CS rate, including advanced maternal age, increasing use of assisted reproductive techniques, reduced parity, patient preference for elective CS, and the growing number of pregnancies with prior caesarean scars—all of which increase maternal and fetal complications.

Given these concerns, the present retrospective study was conducted to assess maternal and fetal outcomes in elective versus emergency caesarean sections performed at our hospital.

Materials and Methods

This retrospective study included all obstetric patients who underwent caesarean section (n = 720) at Shri Balaji Institute of Medical Science, Raipur, Chhattisgarh, a tertiary care centre. Maternal variables considered were age, parity, fetal malpresentation, previous caesarean section, placenta praevia, cephalopelvic disproportion (CPD), fetal growth restriction (FGR), and preeclampsia. Intraoperative and postoperative maternal complications were recorded.

Neonatal variables included the gestational age at delivery, sex, birth weight, one- and five-minute APGAR scores, need for CPAP or ventilatory support, neonatal complications, and duration of hospital stay. Data were obtained from operation theatre,

labour room, and NICU registers. Analysis was done using simple percentage calculations.

Inclusion Criteria:
All obstetric patients who underwent elective or emergency caesarean section (n = 720) during the one-year period from July 2024 to July 2025.

Exclusion Criteria:
All obstetric patients who underwent normal vaginal delivery or instrumental delivery.

Results

A total of 1,980 obstetric patients were admitted to the labour room and obstetric ward during the study period, of whom 720 underwent caesarean section, giving a CS rate of 36.7%. Among these, 350 (48.6%) were emergency and 370 (51.4%) were elective caesarean sections. Spinal anaesthesia was administered in 700 patients (97.2%), while general anaesthesia was used in 20 patients (2.8%). Of those receiving general anaesthesia, 15 were emergency and 5 were elective cases. The most common indication for caesarean section was repeat lower-segment caesarean section (LSCS).

Table 1: Indications of caesarean section

Indication	Elective	Emergency	Total	Percentage (%)
Post LSCS	125	112	237	32.9
Pregnancy	Nil	71	71	9.9
Fetal Distress	Nil	73	73	10.1
Non Progress of labourMalpresentations (Breech/Transverse)	45	32	77	10.7
Placenta previa/APH	25	18	43	5.9
CPD/Contracted Pelvis	65	5	70	9.7
Severe FGR	65	7	72	10
Severe Preeclampsia	35	28	63	8.8
Twins with discordance	10	4	14	1.9
Total	**370**	**350**	**720**	**100**

Out of the total LSCS done, 237(32.9%) were post LSCS pregnancies. Fetal distress was seen in 71 cases (9.9%) non-progress of labour in 73 cases (10.1%), malpresentations in 77 cases (10.7%), placenta praevia and antepartum haemorrhage in 43 cases (5.9%), CPD or contracted pelvis in 70 (9.7%), severe FGR in 72 cases (10%), severe pre-eclampsia in 63 cases (8.8%) and twins with discordance in 14 cases (1.9%). (Table 1)

Table no.2: Intraoperative maternal complications in LSCS (n=27)

Complications	Total	Elective (%)	Emergency (%)
PPH	24	25.9	62.9
Blader injury	2	0	7.4

Casecaren hysterectomy	1	0	3.7
Total	27	6	

As we can see in table 2, there were 27 patients whohad intraoperative complications. Out of these, post-partumhaemorrhage (PPH) was the most common. It was seen in 24 cases (88.9%).Out of these, 24(62.9%) were seenin emergency LSCS whereas 11(28.9%) in elective cases.There were 2 cases of bladder injury (7.4%) which was seenin post LSCS pregnancy presenting in labour. There was one case of caesarean hysterectomy (3.7%) which was post LSCS pregnancy with placenta accreta. PPH was mainlymanaged medically. There were three patients in whom B Lynch suturing was done.

Table 3: Postoperative complications in caesarean section

Complications	Total	Elective (%)	Emergency (%)
Fever	26	13.7	31.04
Surgical site infection	13	6.9	15.5
PPH	8	5.2	8.6
Spinal headache	11	6.8	12.1
Total	58	32.8	67.2

Among the postoperative complications there were a total of 58 cases who had complications seen inpostoperative period. These were more commonly seen in emergency cases which accounted for 58 cases.Fever was seen in 26 patients (44.1%) making it the mostcommon post op complication. Others being surgical siteinfection, PPH and spinal headache. (Table 3)

Table 4: Fetal outcomes and complications

Fetal Outcome	Elective	Emergency
Total NICU admissions	15	65
Respiratory distress	11	38
Meconium Aspiration	3	11
sepsis	Nil	4
Perinatal deaths	1	2

Out of babies (including twins), 719 (99.9%) wereborn alive. There were total 80 admissions in NICU in LSCS patients. Out of these, 65 (81.3%) were from emergency LSCS cases and15 (19.7%) were from elective LSCS. 1baby in emergency group was still birth. The total number of perinatal deaths were 3; 2 in emergency group and 1 in elective group. (Table 4)

Discussion

Globally, the rate of caesarean section has been rising rapidly.[6–9] In our study, the CS rate was 36.7%, of which 48.6% were emergency and 51.4% were elective procedures. This rate is considerably higher than the WHO recommendation of 10–15%. The observation that “caesarean once, caesarean always” is becoming increasingly common has significantly contributed to the global rise in CS rates over

recent decades.[10] The most frequent indication in our study was a previous lower-segment caesarean section (LSCS), consistent with findings from earlier studies.

Elective LSCS is generally recommended in women with more than two previous caesarean deliveries, those with a prior classical incision, previous uterine rupture, or conditions such as placenta praevia.[11–12] Multiple systematic reviews and meta-analyses have evaluated the safety of trial of labour after caesarean (TOLAC) in women with one or more prior LSCS.[13–14] A retrospective cohort study conducted at the Community Medical Center (2008–2018) comparing maternal and neonatal outcomes in women with two previous caesareans undergoing TOLAC versus elective repeat LSCS reported no significant difference in maternal or neonatal morbidity between the groups.[15] Conversely, a recent systematic review and meta-analysis by Hui Mao et al. reported an increased risk of uterine rupture and maternal mortality in women undergoing TOLAC after two previous caesareans, emphasizing the importance of individualized counseling and shared decision-making.[16]

Regarding the timing of elective LSCS, the American College of Obstetricians and Gynecologists (ACOG) recommends scheduling elective caesarean delivery at 39 completed weeks in the absence of medical or obstetric complications requiring earlier delivery.[17] TOLAC remains an important strategy to reduce morbidity associated with rising CS rates, particularly in women with a single previous LSCS. However, unsuccessful TOLAC is associated with increased maternal and neonatal complications. Several factors influence the likelihood of successful TOLAC, including maternal age, indication for previous CS, inter pregnancy interval, Bishop score, fetal weight, and current obstetric conditions.[18–19] In our institution, being a tertiary referral centre for high-risk pregnancies, elective repeat LSCS is typically scheduled between 38 and 39 weeks. TOLAC is offered only to eligible women presenting in spontaneous labour with no contraindications such as cephalopelvic disproportion, contracted pelvis, malpresentation, or placenta praevia.

The CS rate in our study is comparable to that reported by Ethisham S. et al. (44.8%), where previous LSCS was also the most common indication.[20] Similar findings were reported by Singh et al. in 2019.[21] A multicentric report by Angan Sengupta et al. (2021) demonstrated that CS rates in India vary between 23% and 40% across different states. [22] In our study, previous LSCS accounted for 39.0% of indications, followed by presentation, fetal growth restriction, cephalopelvic disproportion/ contracted pelvis, severe preeclampsia, fetal distress, non-progress of labour, placenta praevia/antepartum hemorrhage, and twin gestation with discordance.

Maternal complications in both intraoperative and postoperative periods were more frequent in the emergency CS group compared to elective procedures. The overall complication rate in our study was 7.9%, with emergency caesareans contributing to 69.4% of intraoperative and 62.5% of postoperative complications. Maral Hosseinzadeh et al. (2023) similarly reported primary postpartum hemorrhage (PPH) as the most common complication associated with CS, along with postoperative fever, surgical site infection, PPH, and spinal headache.[23–24]

In our study, 80 neonates required NICU admission following CS. Neonatal morbidity and mortality were significantly higher in the emergency CS group. Respiratory distress, meconium aspiration, sepsis, stillbirths, and perinatal deaths contributed to

approximately 10% of neonatal complications, with 81.3% occurring after emergency CS and only 18.7% after elective CS. There were four perinatal deaths in the emergency group compared to one in the elective group.[25]

Conclusion

The global increase in caesarean section rates is associated with rising maternal and neonatal morbidity. Maternal and fetal outcomes depend on multiple factors, including maternal age, associated medical disorders such as preeclampsia, gestational diabetes mellitus (GDM), thrombophilia, anemia, jaundice, renal disease, and obstetric factors such as urinary tract infection (UTI), premature rupture of membranes (PROM), preterm labour, chorioamnionitis, fetal growth restriction, and congenital anomalies. The increase in CS rates has also led to a higher incidence of placenta accreta spectrum, further contributing to maternal and neonatal morbidity and mortality. With improved antenatal care, patient education, and emphasis on regular follow-up, along with offering TOLAC where medically appropriate, maternal and fetal outcomes can be significantly improved.

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Conflict of Interest
None declared

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