

## A COMPARISON OF MATERNAL AND FETAL OUTCOMES IN EMERGENCY OVER ELECTIVE LOWER SEGMENT CESAREAN SECTION

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### Abstract

**Background:** Caesarean delivery is the foetus's birth through an incision in the abdominal and uterine walls. It is one of the most performed surgical procedures in today's obstetric practice. The purpose was to analyse and compare the maternal and foetal outcomes in emergency and elective lower segment caesarean sections and to give better results by taking early precautions. Studying intraoperative and postoperative maternal complications in emergency and elective lower-segment caesarean sections and checking for foetal complications in emergency and elective lower segment caesarean sections. **Materials and Methods:** This prospective case-control study was conducted in the Department of Obstetrics and Gynaecology at Shadan Institute of Medical Sciences Hyderabad from October 2017 to September 2019. A total of 200 patients were enrolled in the study after taking consent. This case-control study studied 100 cases of emergency lower segment caesarean sections (Emergency LSCS) & 100 cases of elective lower segment caesarean sections (Elective LSCS). **Result:** Significant maternal complications, haemorrhage (36 % Vs 14%), uterine incision extension (24% Vs 9%), and requirement of blood transfusion (32% Vs 14 %) were observed intra-operatively in emergency and elective caesarean sections, respectively, (P<0.01). In emergency and elective caesarean sections, significant postoperative complications were postpartum haemorrhage (29 % Vs 13%) and postoperative blood transfusions (28% Vs 8 %). Significant perinatal complications, meconium-stained liquor (22 % Vs 4%), and the need for NICU admission (30% Vs 12%) were observed in emergency and elective caesarean sections, respectively(P<0.01). **Conclusion:** Emergency caesarean section was associated with more maternal and foetal complications than Elective caesarean section.

## INTRODUCTION

The birth of a foetus via an incision in the uterine and abdominal walls is known as a caesarean section or caesarean delivery. Caesarean section has become an accepted standard among modern obstetric procedures reducing maternal and foetal morbidity and mortality. Caesarean section rates are rising globally due to changes in contemporary lifestyles. It raises the question of what factors play a role in increasing caesarean section rates and these differences.<sup>[1-6]</sup> In developed countries like the USA, the figure of caesarean delivery was decreasing, in large part, due to increased vaginal birth after prior caesarean (VBAC) and, to a lesser extent, a slight decrease in the primary caesarean rate. According to the WHO, the caesarean section should be restricted

to 10-15% in developing countries to have a healthy maternal and infant environment.<sup>[7,8]</sup> However, in India, the incidence of caesarean section was as high as 30% and tended to become the norm.<sup>[9,10]</sup> In some cases, caesarean section was because of a lack of tolerance on the patient's part or her physician's.<sup>[11]</sup> According to the American College of Obstetrics and Gynaecologists (ACOG), the highest variation occurs among nulliparous women with term singleton fetuses with cephalic presentation and without other complications. High-risk patients have much lower variation in caesarean delivery rates between practitioners and hospitals. The maternal and foetal morbidity and mortality varied according to the type of caesarean section done and was more in the emergency caesarean section.<sup>[11]</sup> According to the ACOG task group on caesarean birth, "when

feasible, obstetric practitioners should delay the administration of epidural anaesthesia in nulliparous women until cervical dilatation reaches at least 4-5 cm." This recommendation was founded on previous research that found epidural anaesthesia increased the likelihood of caesarean delivery by up to 12-fold.<sup>[12]</sup> With the growing emphasis on the antenatal and intrapartum status of the fetus and the addition of laboratory status and technical progress of internal foetal monitoring, an increased caesarean section rate should be expected. There must be an optimal caesarean section rate in which the maternal risks are in balance with the benefits of the fetus.<sup>[13]</sup> Despite its significance, little research, particularly from our area, correlates maternal morbidity and mortality with perinatal outcomes in patients with elective or emergency caesarean sections. Therefore, this study was to determine the effect of emergency and elective caesarean section on maternal and neonatal outcomes.

## MATERIALS AND METHODS

**Methodology:** A prospective case-control study was conducted in the Department of Obstetrics and Gynaecology and Paediatrics at Shadan Institute of Medical Sciences from October 2017 to September 2019. Institutional Ethical Committee approval was obtained. A total of 200 patients undergoing caesarean section (elective and emergency – 100 each) along with their newborns were enrolled in the study after detailing the study procedure in the local language and receiving written informed consent from them. Out of 200 patients, 100 consecutive patients from the elective group and 100 from the

emergency group were enrolled on the study after satisfying the inclusion and exclusion criteria.

### Inclusion Criteria

All age group pregnant women with a singleton pregnancy, irrespective of parity status regardless of the previous mode of delivery, were admitted to the outpatient department and emergency ward.

### Exclusion Criteria

Multiple pregnancy, Gestational Diabetes mellitus.

### Statistical Analysis

The quantitative data was represented as their mean  $\pm$  SD. Categorical and nominal data were expressed in percentages. The t-test was used for quantitative data; the Mann-Whitney test analysed non-parametric and categorical data using the chi-square test. The significance threshold of the p-value was set at  $<0.05$ . All analysis was carried out by using SPSS software version 21.

## RESULTS

Regarding age distribution, both groups were comparable. In both groups, the average age of the pregnant women was between 21 and 25. The mean age of cases undergoing elective caesarean sections was 25.54 years, compared to 25.46 years for emergency caesarean sections ( $p=0.88$ ). When opposed to emergency sections, which were reported more frequently in primigravida (36% vs 12%), elective caesarean sections were significantly related to multi-gravida (88%) as compared to emergency sections (64%). Emergency caesarean sections were reported more frequently in those hospitalised through the emergency room ( $p<0.01$ ).

**Table 1: Comparison of study groups as per age distribution**

Age Group (years)	Group		Total	
	Elective	Emergency		
$\leq 20$	2	13	15	p-value 0.4
21-25	52	47	99	
26-30	38	25	63	
31-35	8	15	23	
Primi	12	36	48	p-value $<0.01$
Multi	88	64	152	

**Table 2: Comparison of study groups as per Indication of Cesarean section**

Indications for LSCS	Group		Total	p-value
	Elective	Emergency		
Fetal Distress	0	15	15	$<0.01$
Malpresentation	9	7	16	0.79
Failure to Progress	0	9	9	$<0.01$
One Previous LSCS	30	14	44	$<0.01$
Two Previous LSCS	43	19	62	$<0.01$
CPD	11	0	11	$<0.01$
APH	0	2	2	0.49
PROM	0	10	10	$<0.01$
Obstructed Labour	0	2	2	0.49
IUGR	7	3	10	0.33
Severe Preeclampsia/Eclampsia	0	12	12	$<0.01$
Failed Induction	0	7	7	0.014

**Table 3: Comparison of study groups as per Intra-operative Complications**

Intra-op Complications	Group		Total	p-value
	Elective	Emergency		
Atonic Uterus	5	12	17	0.13
Haemorrhage	14	36	50	<0.01
Uterine Incision Extension	9	24	33	<0.01
Bladder Injury	0	2	2	0.49
Difficult Intubation	0	5	5	0.06
Blood Transfusion	14	32	46	<0.01

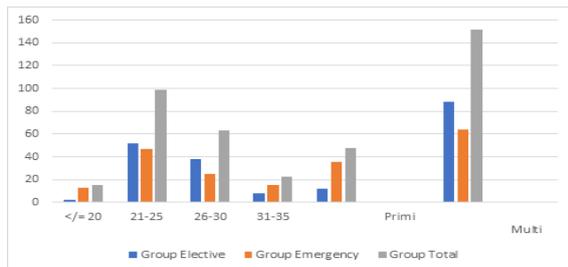
**Table 4: Comparison of study groups as per presence of post-operative complications**

Post-op Complications	Group		Total	p-value
	Elective	Emergency		
PPH	13	29	42	<0.01
RTI	6	13	19	0.15
UTI	8	20	28	0.24
Wound Infection	6	16	22	0.04
Burst Abdomen	0	2	2	0.49
Post-op Blood Transfusion	8	28	36	<0.01

**Table 5: Comparison of study groups as per Hospital stay**

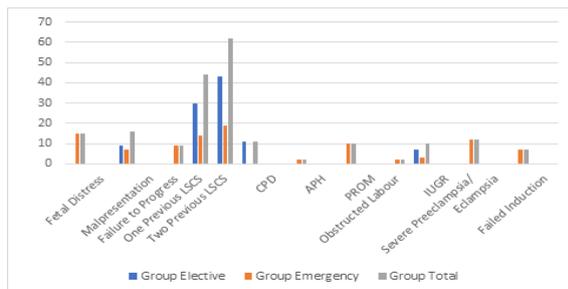
Hospital Stay	Group		Total
	Elective	Emergency	
<1 week	97	80	177
>1 week	3	20	23
Total	100	100	200

p-value <0.01



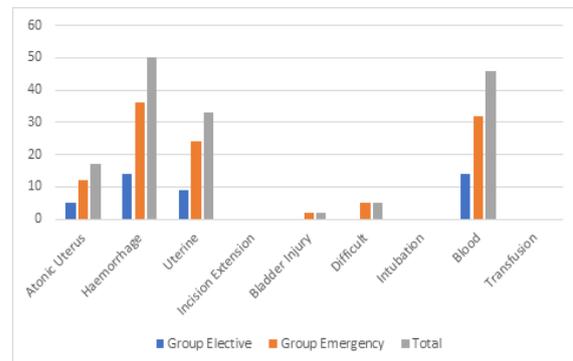
**Figure 1: Comparison of study groups as per age distribution**

The most common indications for elective sections were a history of caesarean section (73%), followed by CPD (11%) and mal-presentation (9%). The most common indications for emergency sections were a history of caesarean section (33%), followed by foetal distress (15%), PIH (12%), and PROM (10%). Intra-op complications were reported in 40% of cases of emergency caesarean section as compared to 14% of cases of elective sections. The difference was statistically significant ( $p < 0.01$ ). Intra-op complications significantly associated with emergency sections were haemorrhage (36% vs 14%) and uterine incision extension (24% vs 9%).



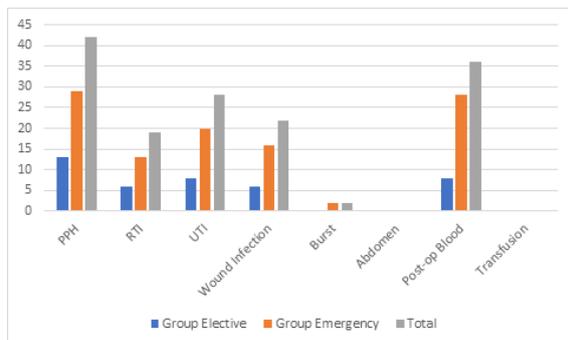
**Figure 2: Comparison of study groups as per Indication of Cesarean section**

The requirement for blood transfusion was reported in 32% and 14% of cases of emergency and elective sections, respectively ( $p < 0.01$ ). Post-op complications were reported in 68% of cases of emergency Caesarean section compared to 33% of cases of elective sections. The difference was statistically significant ( $p < 0.01$ ). Post-op complications significantly associated with emergency sections were postpartum haemorrhage (29% vs 13%) and wound infection (16% vs 6%). The requirement for blood transfusion was reported in 28% and 8% of emergency and elective sections cases, respectively ( $p < 0.01$ ). A hospital stay of more than one week was required in 20% of cases of emergency sections compared to 3% of cases of elective sections.



**Figure 3: Comparison of study groups as per Intra-operative Complications**

The difference was statistically significant ( $p < 0.01$ ). Perinatal complications were reported in 48% of cases of emergency caesarean section as compared to 20% of cases of elective sections. The difference was statistically significant ( $p < 0.01$ ).



**Figure 4: Comparison of study groups as per presence of post-operative complications**

Significant perinatal complications related to emergency sections were: meconium-stained liquor (22% vs 4%) and respiratory distress syndrome (11% vs 2%). NICU admission was required in 30% of babies of emergency-section mothers, while early neonatal death was reported in 3% of emergency-section mothers, compared to 12% and 0% in elective cases.

## DISCUSSION

Caesarean section was one of the oldest operations performed. In the past, it was usually performed for maternal reasons, but nowadays, it is frequently performed for foetal and maternal causes. It was a primary surgical intervention associated with significant immediate and delayed maternal morbidity and mortality. The present study compared intraoperative and postoperative maternal and foetal complications in emergency and elective lower-segment caesarean sections. The study included 100 cases of emergency lower segment caesarean sections group (cases) and 100 cases of elective lower segment caesarean sections group (controls).

**Demography:** In our study, the mean age of the cases with elective caesarean section was 25.54 years, while that of the emergency section was 25.46 years ( $p=0.88$ ). Bhandari BR et al,<sup>[8]</sup> observed that 48% of females aged 21-25 had a mean age of 23.0. They also observed that both groups were comparable concerning age distribution. Sreenivas SK et al,<sup>[9]</sup> observed that the maximum number of patients undergoing CS belong to the age group of 18-24 years of age (62.7% in cases and 49.3% in controls;  $p=0.21$ ). The study's findings correlated with Mussart N et al,<sup>[10]</sup> with a mean age of 27.45 years, and no difference was reported between emergency and elective CS cases.

**Obstetric history:** Results observed in the study by Diana V et al,<sup>[11]</sup> had similar findings. The percentages of the primigravida were significantly higher in emergency Caesarean section than in elective Caesarean section ( $P<0.0001$ ).

**Indication:** In the present study, the most common indications for the elective section were the history of caesarean section (73%), followed by CPD (11%)

and mal-presentation (9%). The most common indications for emergency section were a history of caesarean section in labour (33%) followed by foetal distress (15%), PIH (12%) and PROM (10%). Suwal A et al,<sup>[12]</sup> also observed that usual indications of emergency caesarean section were foetal distress, the previous caesarean section in labour, non-progress of labour and prolonged second stage. The typical indications of elective caesarean section were previous caesarean section, breech, cephalopelvic disproportion and the caesarean section on demand. Gurunule A et al,<sup>[13]</sup> reported that foetal distress was the most common indication in the emergency LSCS group (32.3%), followed by meconium-stained amniotic fluid (20%) and CPD (12.7%). The most common indication for elective LSCS was previous LSCS not willing for vaginal birth in 79 (26.6%), followed by a breech presentation (19.3%) and previous multiple LSCS (17.6%). Sreenivas SK et al,<sup>[9]</sup> also found that the most common indication for LSCS in emergencies was foetal distress (37.3%), followed by previous LSCS accounting for 24%. In contrast, 44% accounted for previous LSCS in elective cases, and cephalopelvic disproportion (CPD) ranked second (30%). Diana V et al,<sup>[11]</sup> in their study, observed that percentages of previous caesarean sections were significantly higher among those who had elective caesarean compared to emergency caesarean section ( $P=0.0001$ ). It suggested that the present study's decision to have elective caesarean mainly depended on women who had one or more previous caesarean sections before the current delivery.

**Intraoperative Complications:** Intraoperative complications were reported in 40% of cases of emergency caesarean section compared to 14% of cases of elective sections ( $p<0.0$ ). Intra-op complications significantly associated with emergency sections were haemorrhage (36% vs 14%) and uterine incision extension (24% vs 9%). The requirement for blood transfusion was reported in 32% and 14% of cases of emergency and elective sections, respectively ( $p<0.01$ ). Bladder injury was reported in 2% of emergency caesarean sections (2% vs 0). Gurunule A et al,<sup>[13]</sup> reported higher obstetric complications in emergency LSCS ( $P=0.059$ ). The uterine extension was the most common obstetric complication seen in 5 (1.7%) compared to none in elective cases. Sreenivas SK et al,<sup>[9]</sup> observed that the odds of developing intraoperative complications were five times higher in an emergency than in elective cases. PPH was the most frequent intraoperative complication, followed by uterine angle extended with bleeding in emergency CS cases. Diana V et al,<sup>[11]</sup> reported that those who had undergone emergency caesarean had nine times more risk of having intra-op complications than those who opted for elective caesarean (OR=9.0,  $P<0.05$ ). Atonic postpartum haemorrhage was the major intrapartum complication in elective (6.7%) and emergency (17.9%) caesarean sections. The odds of occurrence

of this complication were three times higher in emergency cases than in the elective group ( $P < 0.05$ ). Neilson et al,<sup>[14]</sup> also showed that the intraoperative caesarean section complications rate was higher in an emergency than in the elective section.

**Post-op Complications:** Post-op complications were reported in 68% of cases of emergency caesarean section compared to 33% of cases of elective sections ( $p < 0.01$ ). Post-op complications significantly associated with emergency sections were postpartum haemorrhage (29% vs 13%) and wound infection (16% vs 6%). The requirement for blood transfusion was reported in 28% and 8% of emergency and elective sections cases, respectively ( $p < 0.01$ ). A hospital stay of more than one week was required in 20% of cases of emergency sections compared to 3% of cases of elective sections. The difference was statistically significant ( $p < 0.01$ ). Suwal A. et al,<sup>[12]</sup> reported a substantial difference in the length of hospital stay, PPH, and wound infection rates, indicating that these were more common in emergency caesarean section. Gurunule A et al,<sup>[13]</sup> observed that postoperative morbidity was more marked in the patients undergoing emergency LSCS as compared to those undergoing elective LSCS, concerning fever and infection rate ( $p < 0.05$ ). Sreenivas SK et al,<sup>[9]</sup> reported that the odds of developing postoperative complications were ten times more in emergency cases ( $p < 0.01$ ). Post-op complications significantly associated with emergency sections were postpartum haemorrhage (13.3% vs 3.3%) and wound infection (9.3% vs 1.3%). Diana V et al,<sup>[11]</sup> also reported significantly higher post-op complications in cases of emergency caesarean section (49%) as compared to instances of elective sections (24%). Other studies,<sup>[15,16]</sup> also compared the maternal morbidity in emergency and elective caesarean section, and results were significantly worse for emergency caesarean section groups which also coincided with our present study.

**Perinatal Complications:** Perinatal complications were reported in 48% of cases of emergency caesarean section compared to 20% of cases of elective sections ( $p < 0.01$ ). Significant perinatal complications related to emergency sections were: meconium-stained liquor (22% vs 4%) and respiratory distress syndrome (11% vs 2%). NICU admission was required in 30% of babies of emergency-section mothers, while early neonatal death was reported in 3% of emergency-section mothers, compared to 12% and 0% in elective cases. In the study conducted by Najam R et al,<sup>[14]</sup> the number of patients with respiratory distress was four and in only 1 case, meconium aspiration occurred in the elective LSCS group. No case of soft tissue injury was documented in the elective LSCS group. Respiratory distress was seen in 15 patients, meconium aspiration in 8 cases and mild tissue injury in 2 cases were reported in the emergency LSCS group ( $p < 0.01$ ). Gurunule A et al,<sup>[13]</sup> in their study observed that there was a greater chance of

perinatal complications in the emergency LSCS group than in the elective group ( $p < 0.01$ ). There were 12 respiratory distress cases and no meconium aspiration and scalp injury in the elective LSCS group. In patients undergoing emergency LSCS, 21 cases of respiratory distress, one case each of meconium aspiration and meconium aspiration with respiratory distress, were seen. Only one case of scalp injury was documented in the emergency LSCS group.

Sreenivas SK et al,<sup>[9]</sup> observed neonatal complications in 46% of cases of emergency CS as compared to 32% in elective CS cases ( $p < 0.05$ ). A significant difference was observed in the incidence of neonatal sepsis and RDS. NICU admission was required in 26.8% of babies, while early neonatal death was reported in 1% of babies of emergency section mothers, compared to 13% and 0% in elective cases.

Diana V et al,<sup>[11]</sup> in their study, observed the overall incidence of complications in the newborn as 2.7% and 10.6% in the elective and emergency caesarean sections, respectively ( $p < 0.05$ ). Observation made in the study by Mussart N et al,<sup>[10]</sup> concurred with our results that overall perinatal morbidity was higher in the emergency group ( $p < 0.05$ ). Sowmya M et al,<sup>[17]</sup> observed a statistically significant difference in stillbirths, neonatal deaths, and severe neonatal morbidity between emergency and elective caesarean sections, which was probably related to prolonged labour, asphyxia, and sepsis than elective caesarean delivery. Both elective and emergency caesareans impose certain complications on the mother and the fetus. However, maternal and foetal complications were much higher in the emergency caesarean group than in the elective caesarean group. Emergency caesarean section rate should be lowered by collaborative efforts at all levels and by supporting hospital vaginal births for all primigravida, multiparous pregnant women and those who had a previous caesarean section, provided adequate foetal monitoring and operative facilities are available.

## CONCLUSION

Emergency caesarean section was associated with more maternal complications such as haemorrhage, the extension of uterine incision, atonic uterus, postpartum haemorrhage, need for blood transfusions, wound infection, and prolonged postoperative hospital stay than in Elective caesarean section. Higher Perinatal complications were also reported with emergency caesarean sections compared to Elective caesarean sections. Thus, everything points to the advantages derived from a planned caesarean section compared to one undertaken in an emergency. The proportion of maternal and perinatal complications can be reduced in emergency caesarean section by encouraging all patients to visit antenatal care clinics (ANC)

regularly so that patients who are likely candidates for the caesarean section can be detected early and posted for Elective caesarean section. Every effort in the ANC clinic should be made to pick up the cases that may result in difficult labour. Also, a fully equipped NICU and trained paediatricians should be made available at the tertiary referral institutes where the proportion of emergency LSCS is high.

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