

# Perinatal Outcome: A Comparative Study between Emergency and Elective Caesarean Section at A Tertiary Care Hospital

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## ABSTRACT

**Introduction.** Caesarean delivery is the most commonly performed lifesaving procedure in obstetrics. Caesarean section can be done in emergency and elective basis. There has been rising trend of caesarean section over the last few decades. Both the caesarean sections are associated with fetal risks than vaginal delivery.

**Objectives.** To assess and compare the perinatal outcomes of emergency and elective caesarean sections.

**Methods.** It was a cross-sectional comparative study done in Civil Service Hospital of Nepal over the period of one year starting from January 2021 to December 2021. All the patients who underwent caesarean section during the study period were taken into study. Data regarding perinatal outcomes were analysed by SPSS software.

**Results.** During the study period, there were 1349 total deliveries. Caesarean sections accounted for 52.2% (n=705) of all deliveries. There were a total of 373 (52.9%) emergency CS and 332 (47.1%) elective CS. Most common indications of emergency and elective caesarean section were fetal distress and previous caesarean section respectively. Out of 713 new-born's, 26 (6.9%) were preterm in emergency CS, 4 (2.1%) in elective group which was statistically significant ( $X^2 < 0.001$ ). Regarding APGAR score, need of resuscitation, nursery admission, respiratory distress syndrome, and neonatal intensive care unit transfer, neonates delivered by emergency basis had more number of babies than elective. However, there was no significant difference. There was one early neonatal death in the study period.

**Conclusion.** Caesarean section is in rising trend of late. However, timely decision making skills can certainly lead to better perinatal outcome in caesarean sections.

**Keywords.** Emergency caesarean section; elective caesarean section; perinatal outcome

## INTRODUCTION

Caesarean delivery is the most commonly performed lifesaving procedure in obstetrics. It is defined by birth of the fetus through laparotomy followed by hysterotomy<sup>1</sup>. Caesarean section (CS) can be done as an elective or as an emergency basis depending upon the time and preparation of the patient. The rate of CS differs from an institution to other as well as globally.

According to World Health Organization (WHO), the CS rate above 15% has not shown any benefit in terms of maternal and perinatal outcomes<sup>2</sup>. However, there has been an increasing trend of CS for the last few decades, and it has been associated with higher risk of maternal and perinatal morbidity and mortality than vaginal delivery<sup>3</sup>. Both elective and emergency CS do have their own risks to

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fetus including low APGAR (appearance, pulse, grimace, activity, respiration) score, prematurity, low birth weight, still birth, and early neonatal death.<sup>4,6</sup>

This study was done to assess and compare the perinatal outcomes of emergency and elective caesarean sections.

## METHODS

It was a cross-sectional comparative study done in Civil Service Hospital of Nepal over the period of one year starting from January 2021 to December 2021.

After taking ethical approval from the Institutional Review Board of the hospital, the patients who underwent CS during the study period were taken into study. The data were collected from the operation theater register, baby note from birth register in Operation Theater, nursery admission book, obstetrics and gynaecology admission and discharge register. Data regarding each patient's age, parity, gestational age at CS, type of CS, birth injuries, APGAR score at 1 and 5 minutes, birth weight, need of resuscitation, nursery admission, hospital stay, neonatal intensive care unit transfer, and neonatal death were recorded.

Data were entered and analyzed by SPSS software 28 and results were expressed in terms of mean, percentage, and standard deviation. Pearson's Chi square test was applied for categorical and student t-test for continuous variables.

## RESULTS

During the study period, there were 1349 total deliveries. Caesarean sections accounted for 52.2% (n=705) of all deliveries. There were a total of 373 (52.9%) emergency CS and 332 (47.1%) elective CS.

The mean age of the women in the study was  $29.2 \pm 4.2$  years with the youngest being 19 years and oldest 43 years of age. Mean age in the emergency and elective CS were  $28.3 \pm 4.3$  years and  $30.3 \pm 3.9$  years respectively which was statistically significant ( $X^2 < 0.001$ ).

Mean birth weight of newborn babies in emergency CS was  $3.08 \pm 0.5$  kg and elective was  $3.1 \pm 0.4$  kg. respectively which was statistically significant ( $X^2 < 0.001$ ). There were 65.6% women primiparous in emergency CS whereas 30.1% in elective group which was statistically significant ( $X^2 < 0.001$ ).

Table. 1 Indication of CS

S.N	Indication	Number	Percentage %
1.	Previous CS	253	35.9
2.	Cephalo-pelvic disproportion (CPD)	118	16.7
3.	Fetal distress (FD)	82	11.6
4.	Non-progress of Labour (NPOL)	72	10.2
5.	Malpresentation	45	6.4
6.	Failed Induction	32	4.5
7.	Oligohydramnious	28	4
8.	Antepartum hemorrhage (Placenta previa/abruptio placentae)	20	2.8
9.	Treated subfertility	16	2.3
10.	Intrauterine growth restriction (IUGR)	15	2.1
11.	Multiple pregnancy	8	1.1
12.	Hypertensive disorders of pregnancy	7	1
13.	Bad Obstetrics History (BOH)	5	.7
14.	Cord around the neck	2	.3
15.	Elderly Primigravida	2	.3
Total		705	

Most common indication of CS was previous CS (35.9%) followed by CPD (16.7%) and Fetal distress (11.6%).

**Table. 2** Indications of Caesarean Section (Emergency versus Elective)

S.N	Indication	Emergency	Elective	Total
1.	Previous CS	56	197	253
2.	Cephalopelvic disproportion (CPD)	44	74	118
3.	Foetal Distress (FD)	81	1	82
4.	Non-progress of labour (NPOL)	72	0	72
5.	Malpresentation	23	22	45
6.	Failed Induction	32	0	32
7.	Oligohydramnios	22	6	28
8.	Antepartum haemorrhage (APH)	11	9	20
9.	Treated Subfertility	7	9	16
10.	Intrauterine growth restriction (IUGR)	12	3	15
11.	Multiple pregnancy	2	6	8
12.	Hypertensive disorders of pregnancy	6	1	7
13.	Bad obstetrics history (BOH)	2	3	5
14.	Cord around the neck	1	1	2
15.	Elderly Primigravida	2	0	2
Total		373	332	705

The most frequent indications for emergency CS were fetal distress accounting for 21.7% (81) and NPOL 19.3%(72) whereas Previous CS was the commonest indication in elective group accounting for 59.3%(197). There was a statistically significant association between some of these indications and type of CSs ( $X^2 < 0.001$ ).

Out of 713 newborns, 26 (6.9%) were born preterm in emergency CS while 4 (2.1%) in elective group which was statistically significant ( $X^2 < 0.001$ ). Similarly, 89 (23.8%) were postdated in emergency group whereas 17(5.1%)

in elective CS. Between 37-40 weeks of pregnancy, 258(69.1%) belonged to emergency and 311(93.6%) in elective CS group. The mean gestational age at delivery in both the CSs was 38 weeks. There was one case of neonatal death which was a preterm baby delivered by emergency CS for Antepartum hemorrhage. So, the perinatal mortality was 0.7 per 1000 live births in this study.

Mean birth weight of newborn babies in emergency CS was 3.08.5 and elective was 3.1.4

**Table. 3** Perinatal outcomes

Perinatal Outcome	Emergency	Elective	Total	P Value
APGAR Score at five minutes (<7)	11	5	16	0.1
Resuscitation needed	6	3	9	0.4
Nursery admission	22	13	35	0.2
Respiratory distress syndrome	9	3	12	0.1
NICU transfer	6	1	7	0.4

There were 16 (2.2%) of the babies who had APGAR score at five minutes <7 out of which 11 were in emergency and 5 in elective group. There was no significant difference between the two groups.

Neonatal resuscitation needed in nine (1.2%) neonates out of which six in emergency and three in elective CS

groups which was also not significant.

Regarding respiratory distress syndrome, there were twelve (1.6%) neonates with nine belonging to emergency and three to elective CS groups. However, no significant difference was there between the two groups of CSs.

There were 35(4.9%) newborn babies that were admitted in nursery out of which 22 from emergency and 13 from elective CSs groups. But there was no statistical significant difference between the two groups.

NICU transfer was needed in seven (0.9%) cases where six belonged to emergency and one to elective groups. There was no statistically significant difference between the two groups.

There was no significant difference between the two groups regarding duration of hospital stay.

## DISCUSSION

CS is the commonest surgical procedure done in obstetrics in order to save the life of a mother and a newborn. However, increasing trend of CSs have been explained partly by changing obstetric practice patterns, maternal characteristics and also on demand CSs<sup>7,8</sup>. In countries like Nepal, CS rate is also in increasing trend. In the present study, the rate of CS was as high as 52.2% which is comparable to study done by Khaniya et al<sup>9</sup> in Tribhuvan University Teaching Hospital where the rate was 48.8%. Subedi et al<sup>10</sup> also showed the CS rate of 36.67% in their study. In India study done by Thakur et al<sup>11</sup> and Patel et al<sup>12</sup> had shown the rate to be 30.25% and 42.8% which are also higher than the recommended rate. In this study the rate of CS is high probably because of hospital protocol of repeat CS for cases of previous CS, unavailability of intra-partum monitoring tools, no use of recent technologies like amnio-infusion for meconium stained liquor, more use of cardiotopography and on demand CS.

In this study, emergency CS included 52.9% and elective 47.1% almost similar in two groups. However, studies have shown that rate of emergency CS is higher than elective as shown by Benzouina et al<sup>13</sup> almost 3:1 and 6:1 by Subedi et al<sup>10</sup>. The study done by Khaniya et al<sup>9</sup> surprisingly showed just opposite with elective being 76.5% and emergency being 23.5%.

In the present study, the rate of higher elective CS might be because of a large number of previous CS that were done as elective procedure as this being the hospital protocol because of monitoring problems in order to allow them for vaginal birth after CS.

There was a significant difference in mean age of the patient who underwent emergency CS being younger than elective in the present study as shown by Subedi et al<sup>10</sup>, Benzouina et al<sup>13</sup> and Nuaim et al<sup>14</sup> in their study. Primiparous women were more in case of emergency CS group than elective which was statistically significant. Similar results were seen in the studies done by other

authors as well.<sup>11,13</sup> The difference in age and parity regarding the emergency CS might be because the trend that younger women are allowed for vaginal delivery in order to preserve her future fertility outcome till the emergency CS is decided in case of any events that occur in terms of threat to mother and the baby.

In this study, the most common indication for CS was previous CS. It accounted for 35.5% in the study. Similar results were obtained in the literature as well<sup>10, 11,12,13</sup>. The common indications in emergency group were fetal distress and NPOL whereas previous CS and CPD were the most frequent indications for elective CSs. Studies done by Subedi et al<sup>10</sup>, Thakur et al<sup>11</sup>, Patel et al<sup>12</sup>, Benzouina et al<sup>13</sup>, and Agrawal et al<sup>15</sup> showed similar indications for emergency and elective CSs.

Regarding the fetal risks, emergency CSs seemed to carry more than elective. Considering gestational age more number of cases were born preterm in the emergency group which is not contradictory to other studies<sup>13</sup>. As in elective CSs, there is a tendency to lengthen the pregnancy as far as 39 weeks in an attempt to avoid respiratory problems in newborn unless and until any risk factors coexist. So preterm deliveries are commonly seen in emergency CSs cases. There was a case of neonatal death delivered preterm by emergency CS for APH. The baby died due to respiratory problem within few hours of life. Similar results could be seen in studies done by Benzouina et al<sup>13</sup> and Lueri et al<sup>16</sup>.

In the index study, Poor APGAR at five minutes(<7) was observed in 16(2.2%) babies. Out of which more number of babies in emergency group(n=11), though statistically not significant. Similar outcomes were seen in the studies<sup>10,12,14,17</sup>.

There were more number of cases requiring need of resuscitation following delivery of fetus, need of nursery admission, Respiratory distress syndrome, Need of NICU transfer and duration of hospital stay in emergency CSs group than elective. However, there was no statistical significance between the groups of CSs. Study done by Sichundu et al<sup>18</sup> had observed 11.4% versus 9.8% poor perinatal outcome in emergency versus elective CSs respectively with no significant difference between the two. Similar comparative study were observed by other authors as well<sup>19,20</sup>. In this study, it was seen that perinatal morbidity and mortality found to be less in comparison to other studies<sup>9,10,13,17,18,21</sup>. This lower rate could be based on the early detection and timely decision making as all the CS in the hospital are done by experienced obstetrician only. The lower rate of respiratory problems in elective CSs might be because of term delivery as mean gestational age of elective CS is 38 weeks as shown by some authors<sup>22</sup>.

Contradictory to that Liston et al<sup>21</sup> had demonstrated neonates delivered by caesarean delivery without labour were at risk of respiratory problems. However, the reason for newborns with respiratory difficulty, need of resuscitation, nursery admission, and NICU transfer in emergency group of CSs could be because of CSs done for fetal cause, NPOL in which fetuses are already in an exhausted state.

## CONCLUSION

Caesarean section is in a rising trend of late. Perinatal outcome largely depends on type of caesarean section. However, early detection and timely decision making skills can certainly lead to better perinatal outcome in caesarean sections.

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