

Research Article

Comparative Study of Maternal and Perinatal Morbidities in Elective Caesarean section and Emergency Caesarean Section in a Tertiary Care Centre

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Abstract

Background: Today, Caesarean sections have become one of the most commonly performed surgical procedures due largely to an increase in pregnant mothers demanding pain free procedures and also partially to better imaging techniques which minimize the risks of vaginal deliveries but unfortunately, even these procedures are not totally immune to maternal and fetal morbidity or mortality. Keeping in view the rising trend of caesarean section a comparative study of maternal and perinatal morbidities in Elective and Emergency LSCS in Tertiary Care Centre in Western Part of Maharashtra, India was undertaken.

Methods: A Hospital based prospective observational study was conducted in Dr DY Patil Medical College and Hospital, Pimpri, Pune. A total number of 210 females fulfilling the criteria were included, 105 females in elective and emergency caesarean section group respectively.

Results: In this comparative observational study, the maternal and perinatal morbidities were found to be higher in Emergency LSCS. The maternal complications such as post-operative haemorrhage, post-operative infections, ureteric and bladder injury and the Perinatal complications such as neonatal resuscitation, Birth asphyxia, neonatal death were higher in Emergency LSCS.

Conclusion: Based on observations of our study, it is noted that mothers with higher amount of irregular ANC check-ups are more prone for emergency LSCS. Maternal and perinatal morbidities and mortalities are more common in Emergency caesarean section. We suggest conducting health education pertaining to need for regular ANC check-ups in at risk mothers.

Keywords: Caesarean section; Maternal morbidities; Perinatal morbidities; Neonatal outcomes

Abbreviations

ANC: Antenatal Checkup; LSCS: Lower Segment Caesarean Section; CPD: Cephalopelvic Disproportion; NICU: Neonatal Intensive Care Unit

Introduction

“Caesarean section rates should no longer be thought of as being too high or low, but rather whether they are appropriate or not, after taking into consideration all the relevant information” - Dr. Michael Robson.

Caesarean Section is defined as the birth of a viable fetus through an incision in the abdominal and uterine wall [1]. Caesarean Section is basically classified into two major types based on the “time when the decision to opt for a surgical removal of the child is made”. Elective caesarean is a term used when the procedure is performed at a pre-

decided time during late stages of pregnancy after ensuring that the best quality obstetrics, anaesthesia, neonatal resuscitation and nursing services have been arranged. Emergency caesarean section is a term used when the procedure is performed within a short notice due to an unforeseen or acute obstetric emergency and may or may not involve adequate quality obstetrics, anaesthesia, neonatal resuscitation and nursing services. Due to this reason, it has been associated with increased morbidity and mortality rates for both the mother and the child [2]. Pregnant women undergoing emergency caesarean section have been found to have a higher risk of intrapartum complications like premature rupture of membranes, meconium stained liquor, prolonged labor, antepartum haemorrhage, etc. when compared to those undergoing an elective CS [3].

According to the World Health Organization, the overall number of patients requiring a caesarean section should not exceed 10% to 15% but unfortunately, there has been an alarming increase in the rate of caesarean section [4]. In India, data collected by the Union Ministry of Health and Family Welfare (under the Health Management Information System), showed that 14% of total births in 2018-19 took place through a C-section in public hospitals [around 19 lakh out of 1.3 crore births]. In 2008-09 it was just a little over 6 percent [4.61 lakh out of 73.13 lakh births].

Prior to the availability of wide spectrum antibiotics, blood transfusion facilities and good anaesthetic techniques, caesarean sections were used almost exclusively to save the life of the mother who had a 50% to 70% chance of surviving but with immense advances in anaesthetic services and improved surgical techniques, the morbidity and mortality of this procedure has come down

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considerably facilitating its role as a lifesaver.

The clinician is also likely to regard the procedure of caesarean section as routine, safe and convenient, and certainly less likely to give rise to the complication of scar dehiscence and possible subsequent litigation [5]. There are only two randomized controlled trials that did not show any reduction in perinatal mortality in breech delivery by caesarean section, but the trials were far too small to provide any definitive results [6,7]. The overall fetal complications rate was higher in emergency caesarean section than in elective caesarean section. Early recognition and referral of mothers who are likely to undergo caesarean section may reduce the incidence of emergency caesarean sections and thus decrease fetal complications [8].

Risks Associated with Caesarean Section

Mother

Postoperative Adhesions causing Infertility, Chronic pelvic pain

Incisional Hernias (which may require surgical correction)

Wound Infections occur after caesarean sections at a rate of 3% to 15%. The presence of chorioamnionitis and obesity predisposes to surgical site infection

Severe Blood loss (which may require a blood transfusion)

Mothers can experience an increased incidence of Post-natal depression, or birth-related Post-traumatic stress disorder.

Child

Sepsis due to improper sterilization protocols

Respiratory Distress Syndrome

Need for NICU admission or hospitalization for more than 4-5 days

Wet lung due to retention of fluid in the lungs can occur if not expelled by the pressure of contractions during labor.

Materials and Methods

Study Design: This was a prospective Observational study.

Place of Study: DR. D. Y. Patil Medical College and Hospital and Research Center, Pimpri, Pune.

Period of Study: October 2018 to September 2020.

Sample Size: 210; In a study conducted by Dasari gayathry et al. on maternal morbidity associated with caesarean section in tertiary care hospital, Postoperative complications were found to be associated more with emergency caesarean section (30.6%) than elective caesarean section (14.4%). Entering the data into WinTepi software we concluded the sample size to be 210. 105 cases in each group.

Ethics and Consent: Approval was taken from the institution Ethical Committee before commencing the study.

Inclusion criteria

- Women between the age group of 21-35, undergoing caesarean section
- Singleton pregnancy
- Patient giving informed consent for our study
- Term gestation (37-40 weeks)

Exclusion criteria

- Teenage pregnancy
- Previous uterine surgery like LSCS/ Myomectomy
- Estimated fetal weight >4 kg
- Termination of pregnancy for anomalous baby
- Patient not giving informed consent for our study

Methods and procedures

The present prospective study was carried out on 210 patients undergoing caesarean section, both elective and emergency and their newborn in the Department of Obstetrics and Gynaecology in Dr. D. Y. Patil Hospital, Pimpri, Pune, over a period of 2 years, from 2018 to 2020 (two years after getting permission for study). The study was conducted in 105 patients from elective group & 105 patients from emergency group who underwent caesarean section. Neonatal data was collected till the hospital stay and additional details from NICU. Most of the patients were registered in the OPD of our hospital. The patients, who had visited the Antenatal Clinic for 3 times or more and fulfilled the criteria, were termed as booked cases. All other patients were termed as unbooked cases. Neonatal data was collected till the hospital stay and additional details were collected regarding clinical course of all neonates admitted to neonatal ICU.

The patients were counselled and after the counselling written consent was taken from the patients. All the details of the patient were recorded on the proforma. Similarly, all the necessary information regarding operative procedures, status of the patient, postoperative status, follow up of mother and neonates were recorded in detail. After collecting the primary data, we categorized it under different parameters and created master chart to compare both groups for maternal and neonatal morbidity.

Statistical analysis

The student's unpaired 't' test was used to determine whether there are any statistically significant differences between the means of the two independent groups. Chi-square test was used to test whether distributions of categorical variables differ from each other. The data was analysed using the social science statistics software web version. The graphs and tables were prepared using Microsoft Word and Excel (2010). P value was considered as significant if less than 0.05 at 95% confidence interval.

Observations and results

Age distribution was categorized. Patients between 21-25 years of age were noted to be 40 and 43, between 26-30 were 40 and 42 whereas between 31-35 were 25 and 20 respectively in elective LSCS group and emergency LSCS group (Table 1).

A high number of patients in elective LSCS group had paid regular ANC visits at 80 compared to 60 in emergency LSCS group. The P value was significant at 0.0034 suggesting significantly higher visits in elective LSCS group (Table 2).

The causes of LSCS in elective LSCS group included breech presentation in 27.62%, failed external version in 4.76%, maternal request in 9.52%, placenta previa in 5.71%, pre-eclampsia in 28.57%, cephalopelvic disproportion in 23.81%. The causes of LSCS in emergency LSCS group included foetal distress in 28.57%, dystocia in 38.1%, pre-eclampsia in 19.04% and placental abruption in 14.29% of the mothers (Table 3).

Table 1: Age distribution.

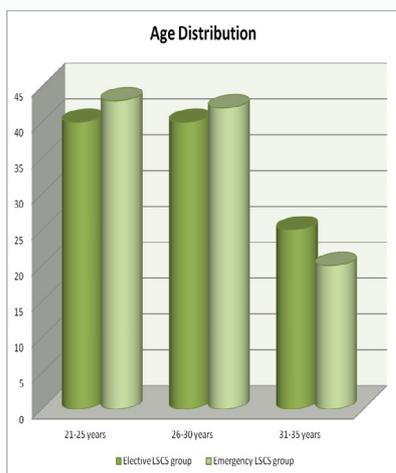


Table 2: ANC visits.

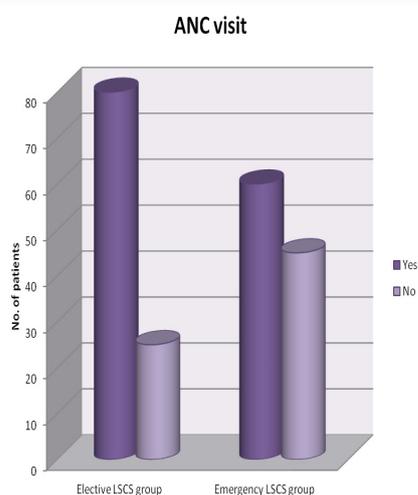
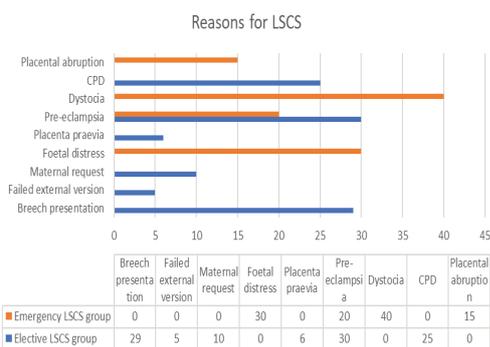


Table 3: Indication for LSCS.



Maternal complication included postoperative traumatic haemorrhage in 3 patients in elective LSCS group compared to 6 in emergency LSCS group, atonic uterine haemorrhage was noted in 2 patients in elective LSCS group compared to 4 in emergency LSCS group. Bladder injury was observed in 1 patient in elective LSCS group compared to 2 patients in emergency LSCS group. Obstetric hysterectomy was performed in one patient in elective LSCS group

compared to 2 in emergency LSCS group. Ureteric injury was noted in one patient each, bowel complications were noted in 2 patients in elective LSCS group compared to 4 in emergency LSCS group, post operative infections were noted in 5 patients in elective LSCS group compared to 11 in emergency LSCS group, postpartum depression was noted in 1 patient in elective LSCS group compared to 2 in emergency LSCS group. Postpartum psychosis was noted in 1 patient each in elective LSCS group and emergency LSCS group. There was 1 maternal death in elective LSCS group compared to 2 in emergency LSCS group (Table 4).

The incidence of birth asphyxia of neonates in elective LSCS group was 3 of 105 compared to 24 of 105 in emergency LSCS group. The P value was significant at <0.001 suggesting significantly higher birth asphyxia in emergency LSCS group (Table 5).

The need for neonatal resuscitation in elective LSCS group was 4 of 105 compared to 16 of 105 in emergency LSCS group. The P value was significant at 0.0047 suggesting significantly higher rate of neonatal resuscitation in emergency LSCS group (Table 6).

Table 4: Maternal complications.

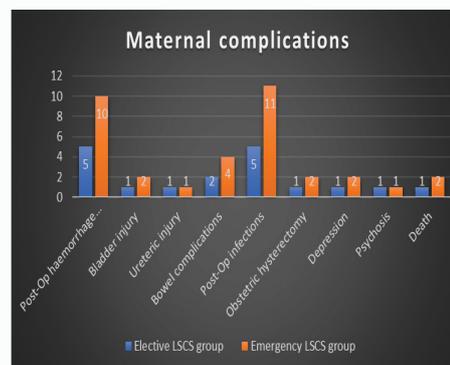
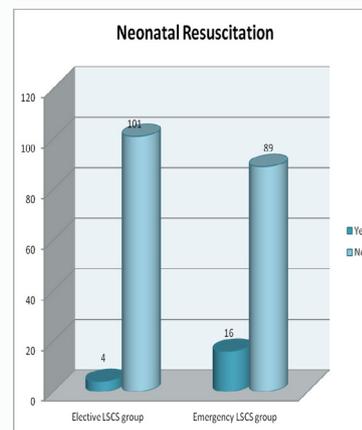


Table 5: Comparison of birth asphyxia.

Birth asphyxia	Elective LSCS group	Emergency LSCS group
Yes	3	24
No	102	81
P value	P<0.001	
Inference	Significantly higher birth asphyxia in emergency LSCS group	

Table 6: Neonatal resuscitation.



The need for NICU admission in elective LSCS group was 9 of 105 compared to 14 of 105 in emergency LSCS group. The P value was significant at 0.269 suggesting both the groups were comparable (Table 7).

The neonatal trauma in elective LSCS group was 1 of 105 compared to 4 of 105 in emergency LSCS group. The P value was non-significant at 0.174 suggesting both the groups were comparable. The neonatal jaundice in elective LSCS group was 2 of 105 compared to 4 of 105 in emergency LSCS group (Table 8).

The neonatal deaths in elective LSCS group was 1 of 105 compared to 2 of 105 in emergency LSCS group. The P value was non-significant at 0.56 suggesting both the groups were comparable (Table 9).

Table 7: NICU admission.

NICU admission	Elective LSCS group	Emergency LSCS group
Yes	9	14
No	96	91
P value	0.269	
Inference	P value >0.05; both the groups were comparable	

Table 8: Neonatal complications.

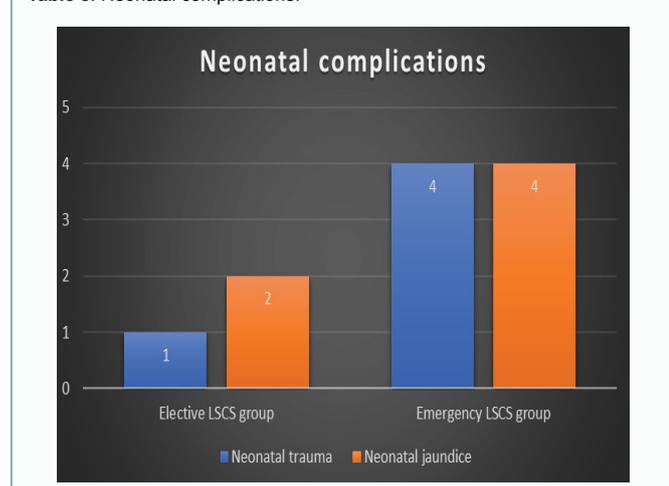


Table 9: Neonatal deaths.

Neonatal deaths	No of subjects
Elective LSCS group	1
Emergency LSCS group	2
P value	0.56
Inference	Non-significant difference

Discussion

Details pertaining to the study

The current study was conducted to evaluate maternal and neonatal outcomes in mothers undergoing either elective LSCS or emergency LSCS in a tertiary care hospital in western part of Maharashtra.

A total of 210 mothers were recruited who satisfied the inclusion criteria and an informed consent was obtained from them explaining them the objectives and procedure of the study in their native language. Mothers unwilling to give a valid consent were not included in the study for evaluation.

The inclusion criteria of the study included mothers aged between 21 to 35 years of age, with singleton pregnancy, having an gestational age of 37 to 40 weeks whereas the exclusion criteria included teenage

pregnancies, estimated fetal weight of more than 4 kgs, history of previous uterine surgeries such as myomectomy or previous LSCS and those unwilling to give a valid consent.

After obtaining a valid consent, patients were randomly divided into two groups of 105 mothers each, whereas one group underwent planned elective LSCS whereas other needed an emergency LSCS.

Evaluation of age

Age distribution was categorized. Patients between 21-25 years of age were noted to be 40 and 43, between 26-30 were 40 and 42 whereas between 31-35 were 25 and 20 respectively in elective LSCS group and emergency LSCS group. Age at marriage and first pregnancy is relatively early in India when compared to other developed countries [9] where the age at pregnancy is still later and that explains higher number of participants in our study who were below 25 years of age. Renuka PA et al. [10] in a similar study noted mean age of 24.9 years in those undergoing emergency LSCS compared to 23.7 years in those undergoing elective LSCS. The age distributions were matched in our study to remove any bias.

ANC check-ups

A high number of patients in elective LSCS group had paid regular ANC visits at 80 compared to 60 in emergency LSCS group. The P value was significant at 0.0034 suggesting significantly higher visits in elective LSCS group. The P value was significant at 0.0034 suggesting significantly higher visits in elective LSCS group. Benzouina S et al. [8], noted that lesser and insufficient prenatal care is associated with a higher number of emergency LSCS.

Causes of LSCS delivery

The causes of LSCS in elective LSCS group included breech presentation in 27.62%, failed external version in 4.76%, maternal request in 9.52%, placenta previa in 5.71%, pre-eclampsia in 28.57%, cephalopelvic disproportion in 23.81%. The causes of LSCS in emergency LSCS group included foetal distress in 28.57%, dystocia in 38.1%, pre-eclampsia in 19.04% and placental abruption in 14.29% of the mothers. Elvedi-Gasparović V et al. [11], noted that most frequent indication for the elective caesarean section were breech presentation, cephalopelvic disproportion and/or pregnancy after IVF/ET (*In Vitro* Fertilisation/Embryo Transfer). While the most frequent indication for the emergency caesarean section was preeclampsia, vaginal bleeding/ abruption placentae, breech presentation and secondary inertia of the uterus.

Maternal complications

Maternal complication included postoperative traumatic haemorrhage in 3 patients in elective LSCS group compared to 6 in emergency LSCS group, atonic uterine haemorrhage was noted in 2 patients in elective LSCS group compared to 4 in emergency LSCS group. Bladder injury was observed in 1 patient in elective LSCS group compared to 2 patients in emergency LSCS group. Ureteric injury was noted in one patient each, bowel complications were noted in 2 patients in elective LSCS group compared to 4 in emergency LSCS group, postoperative infections were noted in 5 patients in elective LSCS group compared to 11 in emergency LSCS group, postpartum depression was noted in 1 patient in elective LSCS group compared to 2 in emergency LSCS group. There was 1 maternal mortality in elective LSCS group compared to 2 in emergency LSCS group. Renuka PA et al. [10] noted a higher rate of complications in their study in mothers with emergency LSCS such as puerperal pyrexia, postpartum

haemorrhage, wound gaping, respiratory infections and UTI when compared to mothers undergoing elective LSCS.

Neonatal outcomes

The incidence of birth asphyxia of neonates in elective LSCS group was 3 of 105 compared to 24 of 105 in emergency LSCS group. The P value was significant at <0.001 suggesting significantly higher birth asphyxia in emergency LSCS group. The need for neonatal resuscitation in elective LSCS group was 4 of 105 compared to 16 of 105 in emergency LSCS group. The P value was significant at 0.0047 suggesting significantly higher rate of neonatal resuscitation in emergency LSCS group. The neonatal trauma in elective LSCS group was 1 of 105 compared to 4 of 105 in emergency LSCS group. The P value was non-significant at 0.174 suggesting both the groups were comparable. The neonatal jaundice in elective LSCS group was 2 of 105 compared to 4 of 105 in emergency LSCS group. The P value was non-significant at 0.407 suggesting both the groups were comparable. The neonatal deaths in elective LSCS group was 1 of 105 compared to 2 of 105 in emergency LSCS group. The P value was non-significant at 0.56 suggesting both the groups were comparable. Renuka PA et al. [10] noted a higher rate of neonatal complications after emergency LSCS than compared to neonates born after elective LSCS. These included respiratory distress syndrome, sepsis, etc. Though the number of neonates with fever, RDS and neonatal deaths were higher in emergency LSCS group, these were not statistically significant.

Conclusion

Based on observations of our study, it is noted that mothers with higher amount of irregular ANC check-ups are more prone for emergency LSCS. Breech presentation, pre-eclampsia and CPD are some of the commonest reasons for elective LSCS compared to emergency LSCS where the common indications included foetal distress, pre-eclampsia, dystocia and placental abruption. There are higher chances of maternal complications like pph bladder injury, post operative infections, bowel complications and post partum depression and psychosis in patients undergoing emergency caesarean section. There are higher instances of birth asphyxia, neonatal resuscitation, nicu admission, neonatal complications and deaths in neonates born after emergency LSCS. We suggest conducting similar studies with a higher patients sample size with a long term follow up also covering the cost implications of emergency LSCS compared to elective LSCS. We also suggest conducting health education pertaining to need for regular ANC check-ups in at risk mothers.

Source of Funding

The cost of investigations for all admitted patients are supported by institution.

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