IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 10 Ser.6 (October. 2021), PP 55-60
www.iosrjournals.org

Comparative Study on Perinatal Outcome in Elective LSCS Versus Emergency LSCS

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Abstract:
Background:
Caesarean section is the delivery of a baby, alive or dead, through an abdominal uterine incision after the period of viability. Caesarean deliveries are known to be associated with fetal risks [prematurity, low APGAR (appearance, pulse, grimace, activity, respiration) score, stillbirth and early neonatal death. Caesarean deliveries may be emergency or elective based on their indications. This study was conducted to compare the fetal outcome between them and find the risk factors that lead to adverse perinatal outcome.
Materials and method:
A prospective observational comparative study on fetal outcome between emergency (RCOG category 1 & 2) and elective (RCOG category 3 & 4) caesarean section was conducted from October 2018 to September 2019 in the Department of Obstetrics and Gynaecology, Yenepoya Medical College, Manglore. Relevant data in terms of indications of LSCS, gestational age, PROM, fetal outcome and perinatal complications; were collected from the patients and compared.
Results:
In our study the fetal outcome in elective caesarean section was better than emergency caesarean section as overall favourable perinatal outcome was 82% in elective LSCS group and 62% in emergency LSCS group. This difference was statistically significant (p = 0.026). Hyperbilirubinemia was the most common complication encountered in both the groups.. 6 (12%) cases of sepsis were encountered in emergency caesarean section group, which may be attributed to PROM, long duration of labor, repeated per vagina examinations etc
Conclusion:
Emergency caesarean section is indispensably associated with certain risk factors, like PROM, labor stress, fetal compromise etc. which are not associated with elective caesarean section and thus contribute to the higher fetal morbidity in emergency caesarean section. In order to decrease the fetal morbidity associated with emergency caesarean section, meticulous management of these factors is essential.

Key Words: *Fetal outcome, Emergency caesarean section, Elective caesarean section, Perinatal outcome.*

Date of Submission: 04-10-2021 Date of Acceptance: 18-10-2021

I. Introduction:

"Caesarean section is the delivery of a baby, alive or dead, through an abdominal uterine incision after the period of viability."(1) Caesarean section is one of the most commonly performed surgeries in the world. However, increasing rate and number of cesarean deliveries are known to be associated with fetal risks [prematurity, low APGAR (appearance, pulse, grimace, activity, respiration) score, stillbirth and early neonatal death(2) . Caesarean deliveries may be emergency or elective based on their indications. Gestational age at the time of elective caesarean section is a very significant factor in terms of iatrogenic neonatal respiratory distress syndrome(3). Tita et al reported that neonatal morbidity is high in those babies born by elective LSCS done before 39 weeks(4). Emergency LSCS is associated with various risk factors that lead to fetal compromise and adversely affect the perinatal outcome. This study was conducted to compare the fetal outcome between them and find the risk factors that lead to adverse perinatal outcome.

II. Materials And Method:

A prospective observational comparative study on fetal outcome between emergency (RCOG category 1 & 2) and elective (RCOG category 3 & 4) caesarean section was conducted in the Department of Obstetrics and Gynaecology, Yenepoya Medical College, Manglore, Karnataka from October 2018 to September 2019. Total of 100 patients were selected for the study.

Study Design: A prospective observational comparative study.

Study Location: This was a tertiary care teaching hospital based study done in the Department of Obstetrics and Gynaecology, Yenepoya Medical College, Manglore, Karnataka from October 2018 to September 2019.
Study Duration: October 2018 to September 2019.
Sample Size: 100 patients, 50 in each group.
Sampling size calculation : Calculated using G – power software with level of significance
Alpha= 5%, power 1- Beta = 80% with 95% confidence interval. The minimum sample size required in each group is 50.
The total sample size is 100.
Subjects and selection method:
In this study the participants were divided into two groups;
Group 1: Women undergoing elective caesarean sections. (RCOG Category 3 & 4)
Group 2: Women undergoing emergency caesarean section (RCOG Category 1 & 2)

Inclusion criteria:
1) All pregnant women with singleton pregnancy, irrespective of parity status,
2) Without pregnancy associated complications,
3) Without any medical risk
4) Without surgical high risk,
5) With any gestational age undergoing lower segment caesarean sections at our hospital
6) Irrespective of their registration status (patients who are referred at the time of delivery and those registered in the antenatal period) will be included.

Exclusion criteria:
All high risk pregnancies eg:
1) Multiple pregnancies
2) Placenta praevia
3) Abruptio placenta
4) Diabetes in pregnancy
5) Severe anaemia(haemoglobin <7g/dl)
6) Pre eclampsia,
7) PROM >24 hrs,
8) More than 2 previous Lscs

The following parameters were studied:
Data was collected in terms of:
1. Gestational age
2. PROM(Premature rupture of membranes) < 24 hrs present/ absent
3. Indications of caesarean section
4. APGAR score
5. Birth weight
6. Fetal outcome and perinatal complications

Procedure Methodology:
Relevant data in terms of indications of LSCS, fetal outcome and perinatal complications; were collected from the patients presenting to the Department of Obstetrics and Gynecology at Yenepoya Medical College Hospital between September 2018 and October 2019,after excluding the candidates as per exclusion criteria. Written informed consent was taken from all patients enrolled in the study. Patients with singleton pregnancy irrespective of gestation age undergoing caesarean sections were enrolled. The study was commenced after the approval of institutional ethics committee.
Emergency LSCS: Is defined as the one in which there is immediate threat to the life of the woman or fetus (RCOG Category 1); or there is maternal and fetal compromise with no immediate threat to the life of the woman or fetus.(RCOG Category 2).
Elective LSCS: Is defined as the one in which there is no maternal and fetal compromise but require an early delivery(RCOG Category 3)or one which is done at a time to suit the woman and maternity services.(RCOG Category 4).

Statistical analysis:
SPSS 22 software was used for statistical analysis. $P < 0.05$ was considered level of significance.

III. Results:

A total of 100 participants were included in the study. They were divided into two groups, of 50 participants each; those who had elective caesarean section(50) and those who had emergency caesarean section(50). **Table no 1** shows the type of caesarean section among the selected patients.

Table no 1: Types of caesarean section.

Caesarean section:		**Count**	**Column N %**
Type	Elective	50	50.0%
	Emergency	50	50.0%
	Total	100	100.0%

The 100 participants in the study were divided into 3 groups according to their gestational age.

Term	>/=37 weeks
Late preterm	34 – 36 weeks 6 days
Early preterm	28 weeks -33 weeks 3 days

Table no 2 compares the Gestational Age in both the groups. There were 3(6%) late preterm deliveries in the Elective LSCS group and 5(10%) in the Emeregency LSCS group. Of the 8 late preterm babies, 7 had birth weight > 2.5 kg and favourable neonatal outcome and did not require NICU admission. However one baby who was delivered by emergency caesarean section for fetal distress developed sepsis. Intra operatively, there was grade 3 meconium and the birth weight of the baby was < 2.5 kg. The baby had downs syndrome which was not detected in antenatal scan.

Table no 2 : Shows the **g**estational Age in both the groups.

	Type of caesarean section:					
	Elective		**Emergency**		**Total**	
Gestational age	**Count**	**%**	**Count**	**%**	**Count**	**%**
>/=37 weeks	47	94.0%	48	96.0%	95	95.0%
34 – 36 weeks 6 days	3	6.0%	2	4.0%	5	5.0%
Total	50	100.0%	50	100.0%	100	100.0%

The participants were assessed for the presence of premature rupture of membranes,(PROM) < 24 hrs.
Table no 3 shows 11 participants had PROM, accounting for 11 % in the study group; out of which all 11(22%) underwent emergency caesarean section for various indications and none had elective caesarean section.

Table no 3 :shows the number of patients presenting with PROM in each group..

	Type of caesarean section:					
	Elective		**Emergency**		**Total**	
PROM	**Count**	**%**	**Count**	**%**	**Count**	**%**
Present	0	0.0%	11	22.0%	11	11.0%
Absent	50	100.0%	39	78.0%	89	89.0%
Total	50	100.0%	50	100.0%	100	100.0%

Table no 4 depicts the indications for caesarean section in both the groups. The most common indication of LSCS in the elective group was previous 1 LSCS not willing for VBAC, accounting to 68%, whereas most common indication for emergency LSCS was fetal distress, accounting to 32 % .

Table no 4: Depicts the indications for caesarean section in both the groups.

		Type of caesarean section:					
		Elective		Emergency		Total	
	Indications	Count	%	Count	%	Count	%
1	Malpresentation	0	0.0%	1	2.0%	2	1.0%
2	Cephalo pelvic disproportion	1	2.0%	5	10.0%	6	6.0%
3	Fetal distress	0	.0%	16	32.0%	16	16.0%
4	Secondary arrest of dilatation	0	.0%	6	12.0%	6	6.0%
5	Deep transverse arrest(DTA)	0	.0%	2	4.0%	2	2.0%
6	Prev.2 LSCS	15	30.0%	4	8.0%	19	19.0%
7	Prev 1 LSCS not willing for VBAC	34	68.0%	13	26.0%	47	47.0%
8	Failed induction	0	0%	3	6.0%	3	3.0%
	Total	50	100.0%	50	100.0%	100	100.0%

Apgar score:
Both elective and emergency caesarean section groups had babies with APGAR score at 1 minute and 5 minute >/=8 . Thus no birth asphyxia was found in both the groups.

Table no 5 shows the Birth weight in both the groups.Of the 100 participants , 8 participants, which comprised 8% of the total participants had low birth weight; of which 2 participants belonged to elective caesarean group and 6 to the emergency caesarean section group. Inspite of being low birth weight (LBW) , the two babies who were delivered by elective caesarean section were term and had no perinatal complications. Of the 6 LBW babies in the emergency caesarean section group, 3 developed sepsis, one of the LBW babies had Down's syndrome, and did not survive beyond a week of neonatal period and 2 were healthy and did not have any perinatal complications. The difference in birth weight between elective caesarean section and emergency caesarean section was not statistically significant with p = 0.596

Table no 5: Shows the Birth weight in both the groups.

	Type					
	Elective		Emergency		Total	
Birth weight	Count	%	Count	%	Count	%
< 2.5 kg	2	4%	6	12.0%	8	8%
2.5 – 4 kg	46	92%	42	84.0%	88	88%
>4kg	2	4%	2	4.0%	4	4.0%
Total	50	100.0%	50	100.0%	100	100.0%

Table no 6 depicts the fetal outcome &Perinatal complications in both the groups. In our study the fetal outcome in elective caesarean section was better than emergency caesarean section as overall favourable perinatal outcome was 82% in elective caesarean section group and 62% in emergency caesarean section group. This difference was statistically significant (p value of 0.026). Among the various complication studied , hyperbilirubinemia was the most common complication encountered. However, the rate was comparable in both the groups. 6 cases of sepsis were encountered , comprising a significant 12 % in the emergency caesarean section group, which may be attributed to PROM, long duration of labor, repeated per vagina examinations etc. Of the 6 cases, 2 had undergone caesarean section for fetal distress, 2 for failure of induction , and 2 for secondary arrest of dilatation, who had presented with PROM on admission. One case of perinatal mortality occurred in the emergency LSCS group. The baby had Downs syndrome with patent foramen ovale and was very low birth weight (1.92kg). The neonate developed hyperbilirubinemia, coaglopathy, metabolic acidodsis, multi organ failure and expired on the 7th day of life.

Table no 6 : Depicts the fetal outcome &Perinatal complications in both the groups.

	Type of caesarean section:					
	Elective		Emergency		Total	
Fetal outcome	**Count**	**%**	**Count**	**%**	**Count**	**%**
Respiratory distress	0	0%	1	2.0%	1	1.0%
Sepsis	0	0%	6	12.0%	6	6.0%
Hyperbilirubinemia	9	18.0%	11	22.0%	20	20.0%
Neonatal death	0	0%	1	2%	1	1%
Healthy	41	82.0%	31	62.0%	72	72.0%
Total	50	100.0%	50	100.0%	100	100.0%

IV. Discussion:

Total study group was of 100 participants.

In our study, 95% of the study population was term and 5% were late preterm. None of the participants were early preterm.

Rani soren et al.(5) also observed that most of the subjects were in the gestational age group of 37-40 weeks -76.92% subjects in elective caesarean section and 71.38% in emergency caesarean group.

In our study, there were 11 cases of PROM, that underwent emergency caesarean section. No case of PROM were in the elective caesarean section group. This difference was highly significant (p = 0.000).

In a study by Valsa Diana et al.(6), they observed that a large proportion of the emergency cases were having premature rupture of membrane (PROM, 33.1%) compared to 5.3% among elective cases. Emergency cases had significantly higher incidences of PROM compared to elective caesarean section(p value <0.05) .

The most common indication of LSCS in the elective group was previous 1 LSCS not willing for VBAC, accounting to 68% , whereas most common indication for emergency LSCS was found to be fetal distress, accounting to 32% and this difference was statistically significant(p value 0.000).

Gurunule et al(7). did a study in which the results were similar, fetal distress was the most common indication in the emergency LSCS group (32.3%) with a p value of 0.000, followed by meconium stained amniotic fluid (20%) with a p value of 0.00. The most common indication for elective LSCS was previous LSCS not willing for vaginal birth in 79 participants (26.6%)with a p value of 0.00(33) .

Thakur V et al.(8)in their study also found similar results showing that, in elective caesarean section group, previous caesarean section was the main reason for caesarean section accounting for 78%. In emergency caesarean section group fetal distress was the main reason for caesarean section, accounting for 30.3%.

APGAR score of all the babies was >/= 8 at 1 minute and 5 minute in our study.

Gasparovic et al.(9)reported mean apgar score at 1 minute and 5 minute to be 8.44±2.01 and 9.31±1.38 in emergency caesarean and 9.36±2.42 and 9.75±0.70 in elective cases, which was similar to our study.

Subedi et al.(10)found in their study, 7 cases of poor Apgar score in emergency caesarean section. There were no cases of poor Apgar score in elective group. However this difference was not statistically significant(p value =0.576).

In our study the fetal outcome in elective caesarean section was better than emergency caesarean section as overall favourable perinatal outcome was 82% in elective caesarean section group and 62% in elective caesarean section group. This difference was statistically significant (p value of 0.026). Among the various complications studied , hyperbilirubinemia was the most common complication in our study which was encountered in both the groups and the rate was comparable. 6 cases of sepsis were encountered, comprising a significant 12% in the emergency caesarean section.

In the study by C. Santhanalakshmi et al.(11), the incidence of neonatal morbidity was about 10% of all caesarean section deliveries, mainly contributed by meconium aspiration 44%. Sepsis contributed to only 9.3% of neonatal mobidity. The incidence of hyperbilirubinaemia was same in both emergency and elective cases whereas all others were more common in emergency group; which is similar to our study. The common causes for neonatal mortality were sepsis and meconium aspiration which were more common in the emergency section groups as in the case of our study also.

Yang(12) ,in his meta analysis of 9 studies, indicated that the rate of fetal complication in Emergency caesarean section was higher than that of Elective caesarean section (P value =0.00001). This finding is also similar to our study.

V. Conclusion:

Keeping in mind the fact that fetal distress was the most common indication of Emergency caesarean section , meticulous labor management may help in decreasing the incidence of the same and improve fetal outcome.

Patients with PROM should be monitored meticulously as it is an additional risk factor for sepsis and thereby leads to increased fetal morbidity. To conclude, Emergency caesarean section is indispensably associated with certain risk factors, like PROM, labor stress, fetal compromise etc. which are not associated with Elective caesarean section and thus contribute to the higher fetal morbidity in Emergency caesarean section. In order to decrease the fetal morbidity associated with Emergency caesarean section, meticulous management of these factors is essential.

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Saniyah Khan Galzie, et. al. "Comparative Study on Perinatal Outcome in Elective LSCS Versus Emergency LSCS." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(10), 2021, pp. 55-60.