



MATERNAL AND FETAL MORBIDITY FOLLOWING CAESAREAN SECTION IN A RURAL TERTIARY CARE HOSPITAL OF SOUTHERN INDIA

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Caesarean section (CS) is one of the most commonly performed surgical procedures all over the world¹. It is associated with high morbidity and mortality as compared to vaginal delivery. The present study was carried out to evaluate the maternal and neonatal outcome and complications in two groups of pregnant women who underwent elective and emergency CS so that measures can be taken to reduce morbidity and mortality.

METHOD: This is a retrospective observational study conducted at the Department of Obstetrics and Gynaecology of our institute. The study was conducted between May 2018 and May 2019. The data was accrued from patient database retrospectively and was entered in Microsoft Excel (Version 16.4) for Windows. Statistical analysis was done using IBM SPSS Statistics (Version 26) for Windows. The difference in proportions was compared using Chi-Square test while the mean difference was compared using the Mann-Whitney U test (after testing for normality using Shapiro-Wilk test). A two-sided p-value of less than 0.05 was considered statistically significant. The data were analyzed with special reference to the indication of CS, to stratify the risk factor for CS and to study the maternal and fetal outcomes following CS.

RESULTS: During the study period, 662 patients underwent CS. The proportion of emergency CS was 401 (60.57%) and elective CS was 261 (39.42%). The most common indication for emergency CS was Cephalopelvic disproportion and the most common indication for elective CS was previous CS. The maternal outcome in terms of postoperative wound infection, post-partum haemorrhage, urinary tract infection, need for blood transfusion, fever, respiratory tract infections and spinal headache was higher in cases who underwent emergency CS than in elective ones. The fetal outcome in terms of birth asphyxia, meconium-stained liquor with fetal distress and need for intensive care unit admission were higher in cases who underwent emergency CS than in elective ones.

Conclusion: Maternal and fetal complications were significantly higher in the emergency CS as compared to elective CS group.

KEYWORDS

CS, fetal outcome, maternal outcome.

INTRODUCTION :

CS is defined as delivery of the fetus, living or dead through an incision on abdominal (laparotomy) and the uterine wall (hysterotomy). The definition does not include removal of the fetus from the abdominal cavity in case of rupture uterus or abdominal ectopic pregnancy². The incidence of maternal morbidity is significantly higher among women undergoing emergency CS than those undergoing elective one³. Caesarean section (CS) is one of the most commonly performed procedures in obstetric practice and is often a life-saving surgery for mother as well as fetus. World Health Organization suggested that the rate of CS should not exceed 15%, however, the rate of CS delivery is constantly increasing⁴. In the 19th century, mortality was more with the major causes being haemorrhage and infection. Aseptic precautions and antiseptic methods with antibiotic therapy, use of blood transfusion, improved surgical technique and improved anaesthesia have all contributed to the dramatic decrease in mortality seen during the last century⁵. Elective caesarean is a term used when the procedure is done at a pre-arranged time during pregnancy to ensure the best quality of obstetrics and anaesthesia care, neonatal resuscitation and nursing services⁶. The procedure is termed as an Emergency CS when it is performed due to unforeseen or acute obstetric emergencies. It is seen that morbidity and mortality are associated more with emergency procedures than with elective procedures⁶.

OBJECTIVE

To stratify the risk factor which increases foeto-maternal morbidity in the postoperative period.

MATERIAL AND METHODS

It was a retrospective study, conducted between May 2018 and May 2019 at a tertiary care hospital. It included 662 pregnant participants who had undergone CS, of which 401 (60.57%) had undergone emergency section and 261 (39.42%) had undergone elective CS.

All CSs performed at the hospital during the one year were included. The outcomes studied were incidence of elective and emergency CS, indications, antenatal complications, intra-operative

and post-operative complications, neonatal intensive care admission and duration of hospital stay. The data was accrued from patient database retrospectively and was entered in Microsoft Excel (Version 16.4) for Windows. Statistical analysis was done using IBM SPSS Statistics (Version 26) for Windows. The difference in proportions was compared using Chi-Square test while the mean difference was compared using the Mann-Whitney U test (after testing for normality using Shapiro-Wilk test). A two-sided p-value of less than 0.05 was considered statistically significant.

RESULTS: A total of 662 patients, who underwent CS during the study period were enrolled in this study. The proportion of emergency CS was 401 (60.57%) and elective CS was 261 (39.42%). The mean age in Elective and Emergency group was 26.1 years and 24.3 years respectively (Figure 1).

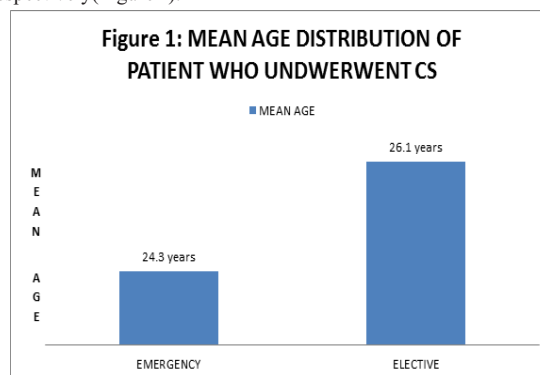


Figure 1. Bar chart showing a comparison of mean age (in years) of patients in emergency and elective group.

In elective CS group, 0.8% were primigravida and 99.2% multigravida whereas in the emergency CS group it was 75.3% and 24.7% respectively (Figure 2).

Figure 2: DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO GRAVIDA

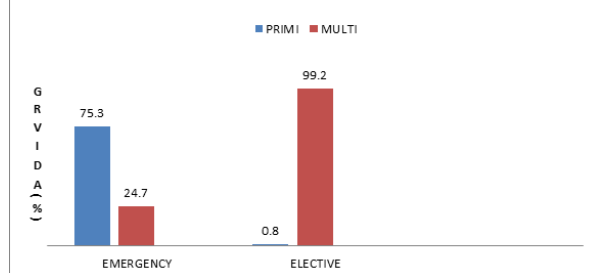


Figure 2. Bar chart showing a distribution of study participants according to gravida in emergency and elective group.

In Elective CS group 11.9% were preterm, and the rest 88.15% term CS. In the Emergency CS group 10.2% was pre-term and the rest 89.8% term.

Figure 3: Distribution of Study Participants according to gestational age among Elective and Emergency Caesarean section.

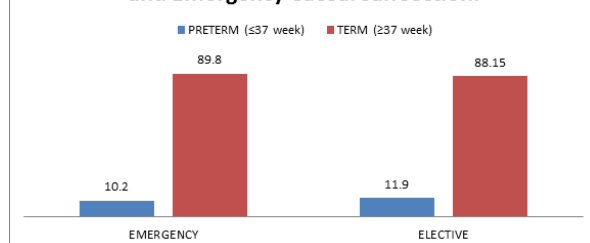


Figure 3. Bar chart showing a distribution of study participants according to gestational age in emergency and elective group.

The most common risk factor for Emergency CS was Gestational hypertension (Figure 4).

Figure 4: Risk factor for Emergency caesarean section

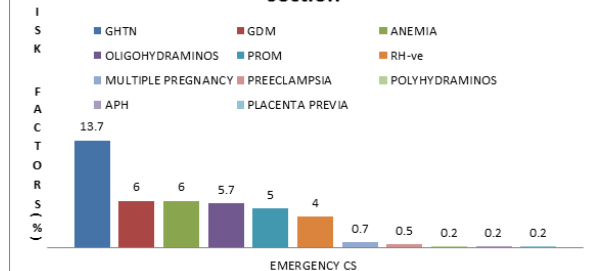


Figure 4: Bar chart showing various risk factor for emergency CS.

The most common risk factor for Elective CS was the previous CS (Figure 5).

Figure 5: Risk factor for Elective caesarean section

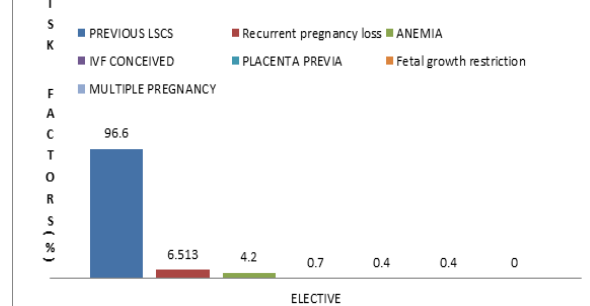


Figure 5: Bar chart showing various risk factor for elective CS.

The most common indication for Elective CS was Previous lscs (Table 1).

TABLE 1: Distribution of Study Participants in Elective CS according to Indications of Caesarean section.	
INDICATION	Elective(%)
Previous lscs	252(96.6%)
Maternal request	20(7.66%)
CPD	3(1.1%)
Breech	3(1.1%)
Placenta previa	1(0.4%)
Severe oligo	0(0.00%)
Multiple pregnancy	0(0.00%)
FGR with absent end-diastolic flow	1(0.40%)

The most common indication for Emergency CS was CPD (Table 2).

TABLE 2: Distribution of Study Participants in Emergency CS according to Indications of Caesarean section.	
INDICATION	EMERGENCY, n(%)
CPD	104(25.9%)
Non Reassuring foetal status with foetal distress	97(24.2%)
Protracted labour	93(23.2%)
MSAF with NRFS	40(10.0%)
Breech	38(9.5%)
Severe oligo	17(4.2%)
DTA	7(1.7%)
Previous lscs	6(1.5%)
Multiple pregnancies	4(1%)
PPROM	3(0.7%)
Persistent OP	1(0.2%)
Antepartum haemorrhage	1(0.2%)
Maternal request	1(0.2%)
FGR	1(0.2%)

The intra-operative finding showed abnormal findings more common in Emergency CS when compared to elective CS, thick MSAF is the most frequent intraoperative finding noted in emergency CS when compared to elective CS which was statistically significant. Adhesion between uterus and abdomen wall, Scar dehiscence were more common intraoperative finding noted in repeat CS (Table 3).

TABLE 3: Distribution of Study Participants according to Intraoperative finding during Caesarean section				
Intraoperative finding	TOTAL n (%)	EMERGEN CY n (%)	ELECTIVE n (%)	P-value
Thick MSAF	54(8.2%)	48(12.0%)	6(2.3%)	<0.01
Thin MSAF	42(6.3%)	30(7.5%)	12(4.6%)	0.146
Cord around the neck	29(4.4%)	21(5.2%)	8(3.1%)	0.244
Bladder pulled up	16(2.4%)	9(2.2%)	7(2.7%)	0.798
Omental adhesion	16(2.4%)	6(1.5%)	10(3.8%)	0.070
Thinned out LUS	13(2.00%)	5(1.2%)	8(3.1%)	0.149
Atonic PPH	7(1.1%)	4(1.5%)	3(0.7%)	0.278
Bicornuate uterus	5(0.8%)	3(0.7%)	2(0.8%)	1.000
Adhesion between uterus and abdomen wall	20(3.00%)	3(0.70%)	17(6.5%)	<0.001
Circumvallate Placenta	1(0.2%)	1(0.20%)	0(0.00%)	1.000
Bladder injury	2(0.30%)	1(0.20%)	1(0.4%)	1.000
Couvellaire uterus	1(0.2%)	1(0.2%)	0(0.00%)	1.000
Follicular cyst	2(0.3%)	0(0.00%)	2(0.80%)	0.155
Scar dehiscence	4(0.60%)	0(0.00%)	4(1.5%)	0.024

In our study maternal complications were more common with emergency CS (59.9%) compared to elective CS (40.1%). Fever, UTI, URTI, LRTI, Wound infection were more common noted in emergency CS than elective CS (Table 4).

TABLE 4: Distribution of Study Participants according to Post-operative complications				
	TOTAL n (%)	EMERGENCY n (%)	ELECTIVE n (%)	P VALUE
Fever	30(4.53%)	18(6.89%)	12(2.99%)	0.018
UTI	15(2.26 %)	10(3.85%)	5(1.25%)	0.028
URTI	17(2.6%)	12(3.0%)	5(1.9%)	0.460
LRTI	5(0.8%)	3(0.7%)	2(0.8%)	1.000

Wound infection	19(2.87%)	12(4.59%)	7(1.74%)	0.0317
Diarrhoea	2(0.3%)	1(0.2%)	1(0.4%)	1.000
Chest pain	1(0.2%)	1(0.2%)	0(0.00%)	0.282
DVT	3(0.5%)	3(0.7%)	0(0.00%)	0.282
Blood transfusion	25(3.77%)	15(5.74%)	10(2.49%)	0.031
Uterine subinvolution	1(0.2%)	1(0.2%)	0(0.00%)	1.000
Spinal headache	143(21.6%)	91(22.7%)	52(19.9%)	0.440
PPH	10(1.51%)	8(3.06%)	2(0.49%)	0.008
Pain	106(16.0%)	63(24.1%)	43(10.7%)	0.00
Thromboembolism	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Uretero vaginal fistula	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)

The neonatal complications were significantly higher in emergency CS(15.7%) than elective(8.4%).Neonatal complication (Respiratory distress , hyperbilirubinemia,culture proven sepsis,HIE) were more common in emergency CS when compared to elective CS(Table 5).

TABLE 5: Distribution of Study Participants according to Neonatal complications				
Neonatal complications	TOTAL n (%)	EMERGENCY n (%)	ELECTIVE n (%)	P-value
Resp distress	34(5.1%)	30(7.5%)	4(1.5%)	<0.05
Hyperbilirubine mia	30(4.5%)	22(5.5%)	8(3.1%)	0.161
Preterm	11(1.7%)	5(1.2%)	6(2.3%)	0.357
LBW	5(0.8%)	3(0.7%)	2(0.8%)	1.000
Culture proven Sepsis	1(0.2%)	1(0.2%)	0(0.00%)	1.000
Hypoglycemia	3(0.5%)	1(0.2%)	2(0.8%)	0.565
HIE	1(0.2%)	1(0.2%)	0(0.00%)	1.000

Figure 6:COMPARISON OF HOSPITAL STAY BETWEEN ELECTIVE AND EMERGENCY CEASEARN SECTION

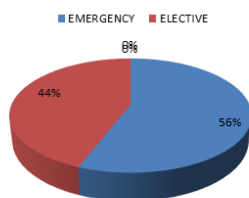


Figure 6 : Figure Showing Comparison Of Hospital Stay Between Elective And Emergency Ceasearn Section .

DISCUSSION:

CS has been practiced as a life-saving procedure for the mother and fetus.Pregnancy and parturition are events of considerable significance in the life of a woman.The advances in the field have reduced maternal mortality considerably.

But the problem of maternal and fetal morbidity after CS is high.In our hospital, the rate of CS was 41.04%,the reason,our hospital being only the tertiary care center which caters to a large population,where most cases are referred.This explains the high rate of CS than recommended by WHO (15 %).The result was comparable to the study done by **Thakur et al**⁷ in which cesarean delivery rate was 30.2%.Out of total CS,Elective CS was 39.42% and Emergency CS was 60.57% which is comparable to the study conducted by **Naveen Darnalet al**⁸.

The mean age in Elective and Emergency group was 26.1 years and 24.3 year respectively this is comparable to the study conducted by **SujaDaneilet al**¹.The increased frequency of emergency CS in the young patients indicates the tendency of the attending obstetrician to allow vaginal deliveries in younger patients as long as this is feasible to avoid a scar on younger, to preserve their future reproductive performances and only resorting to CS when there is a threat of danger to either the patient or her baby.

In the Elective CS group, 0.8% were primigravida and 99.2% multigravida whereas in the Emergency CS group it was 75.3% and 24.7%respectively in our study.In a study reported primigravida was 70%, multigravida were 29 % in emergency caesarean section group

and 19.7% primigravida and 80.3%in elective caesarean section group.

In Elective CS group, the percentage of multigravida was high because 96.6% of Elective CS was done for repeat CS which is comparable to the study conducted by **Suja Daniel**¹ et al.

In our study,in Elective CS group 11.9 % were preterm, rest 88.1% term CS.In the Emergency CS group, 10.2% was pre-term and the rest 89.8% term.

We found that anemia was seen more in Emergency CS group (6%) than Elective CS (4.2%).These patients were referred cases to our hospital in whom antenatal anemia was left uncorrected at the time of referral.It was noted that intra-operatively there was an increased incidence of uterine inertia and atonic PPH, and UTI in the postoperative period in this group of patients.

Overall risk factor(GDM,GHTN,PROM,MULTIPLE PREGNANCY, Oligohydraminos, Placenta previa were more in Emergency CS(43.4%) than Elective CS group (31.8 %).

In Elective CS group risk factor being 96.6 % previous lscs,17 members had a recurrent pregnancy loss, 2 were IVF conceived,1 with placenta previa, 1 with fetal growth restriction.

In Emergency CS group risk factor being 13.7%Gestational hypertension,6%GDM,5.7% Oligohydramnios,5% PROM,4%Rh- ve pregnancy,0.7% with multiple pregnancy ,0.5 %Preclampsia,0.2% antepartum hemorrhage and placenta previa.

In Elective CS group, previous CS was the main reason for CS accounting for 252(96.6%), 40 with previous lscs with gestational HTN,33 with previous lscs with hypothyroidism,20 with previous lscs with GDM, 20 with previous lscs with maternal demand,17 was taken for previous lscs with recurrent pregnancy loss, 4 with previous lscs with scar dehiscence, 2 with previous lscs with pre-eclampsia,others being CPD 1.1%, and 1 with placenta previa.This is comparable to other reported studies where repeat caesarean section was 78% (1).

In Emergency CS group CPD was the main reason for CS, accounting for 25.9%. Others were 24.2% for Non-reassuring foetal status with Foetal distress,23.2% were protracted labour,10% with MSAF with NRFS,9.5 % with breech presentation, 4.2 % with severe oligo,1.7 % with DTA, 1.5 % with previous lscs, and 1% with multiple pregnancies,0.2 % each for persistent OP,Placenta previa,caesarean delivery on maternal request,FGR and 2nd stage arrest.

In our study, intraoperative findings were more seen during Emergency CS (25.7%) when compared to elective group (21.5%), because in case of emergency CS, these patients were already in labour for a longer duration leading to maternal exhaustion and sometimes fetal distress which has lead to increased intraoperative finding.The major finding noted during the emergency CS were thick MSAF(12%),thin MSAF(7.5%), loop of cord around the neck (5.2 %),2.2% with bladder pulled up,1.5 % with omental adhesion,1.2 % with thinned out LUS,4 members had atonic PPH for which B-LYNCH SUTURE and UTERINE ARTERY LIGATION weredone intraoperatively.

The Intraoperative finding noted during elective CS were adhesion between uterus and abdomen wall(6.5%),thin MSAF(4.6%),omental adhesion (3.8 %),thinned out LUS (3.1%),bladder pulled up (2.7 %),scar dehiscence was seen in 4 cases, 0.8% had follicular cyst . There was 1 case of bladder injury in both groups. Overall intraoperative complications were associated more with Emergency CS than with Elective CS possibly due to reasons mentioned above and were comparable to study conducted by **Suja Daniel et al**¹.

In our study maternal complications were as more common with emergency CS (59.9%) compared to elective CS(40.1%) which was comparable to the study conducted by **Suja Daneilet al**¹.

Maternal complications were more with emergency CS, as most of them were in prolonged labour or had membranes ruptured over a period of time, along with multiple vaginal examinations to repeatedly reassess the progress, thereby introducing potent sources for postoperative sepsis.On the other hand,stretching of the lower segment

and the impact of the presenting part into the pelvic cavity may have resulted in increased haemorrhage during emergency CS, thereby increasing the need for blood transfusions in such cases.

The incidence of post-operative fever contributed to 6.89 % in Emergency CS as compared to 2.99 % in Elective CS and was statistically significant ($p = 0.018$). Wound infection contributed to 4.59% in emergency as compared to 1.74% in elective caesarean section ($p = 0.0317$). UTI contributed to 3.85% in emergency caesarean section as compared to 1.25 % in elective caesarean section ($p = 0.028$) which are statistically significant. Incidence of blood transfusion contributed to 5.74 % in Emergency CS as compared to 2.49 % in Elective CS and was statistically significant ($p = 0.031$). The result was also comparable to the study by Naveen Darnal et al⁸.

Pain was more seen with emergency (24.1 %) than elective CS (10.7%). 10 (1.51 %) had PPH, and was more seen with emergency (3.06 %) as compared to 0.49% in elective. This difference was statistically significant ($p = 0.008$).

There was no case of thromboembolism and ureterovaginal fistula in both groups. There were no maternal deaths during the period of study in both cases.

In this study, the fetal complications were significantly higher in emergency CS (15.7%) than elective (8.4%) which was statistically significant (p -value 0.012). Respiratory distress was significantly higher in emergency than elective section (7.5% versus 1.5%, $p < 0.000$).

Need for NICU admission was significantly higher in emergency CS group compared to elective CS group (p -value < 0.05). The incidence of other fetal complication like hyperbilirubinemia, sepsis, hypoglycaemia and low birth weight, HIE individually higher in emergency CS.

Since the majority of emergency caesarean deliveries were performed due to non-progression of labour, with prolonged labour, it is likely that a significant proportion of neonatal morbidity was related to birth asphyxia secondary to prolonged labour and that the interventions may have been performed too late. Close monitoring of labour, early detection of complications and timely decision for caesarean delivery are crucial to bringing down the foetal morbidity.

Various earlier studies by Naveen Darnal et al⁸ and Suja Daniele et al⁹ have reported a higher incidence of fetal complication in emergency CS group. Mean hospital stay did not differ significantly between the two groups.

Maternal and perinatal outcome of our study correlates to study done by Thakur V et al⁷, Suja Daniele et al⁹ they found that the overall complication rate is higher in emergency CS than in elective CS, similar to our study. Antenatal care should be directed to effect-planned CS operations, to reduce the problems associated with emergency CS. Every effort should be made in the antenatal clinic to pick up the cases that are likely to result in difficult labour, such as large babies, contracted pelvis, previous obstetric history, etc., that may indicate the need for CS, to reduce the incidence of failed labour that will end up in emergency CS.

CONCLUSION :

In the present day scenario when the access to obstetric care is growing day by day there has been a concern over the rising caesarean rates all over the world. This surgical procedure has been saving lives for a long period. Even though we cannot avoid an emergency caesarean, the rates can be brought down, if cases are properly selected, with regular antenatal check ups, with judicious use of labour inducing agents and fetomaternal monitoring in active labour using partogram. Adequate hydration of the mother with good labour analgesia play a crucial role in the normal progress of labour. This helps in prompt detection of abnormal labour and complication and timely intervention, resorting to instrumental delivery in the second stage of labour or emergency LSCS whichever is feasible. Fully equipped NICU along with good pediatric back-up will go a long way in reducing neonatal morbidity. CS rates can be reduced by combined efforts at all levels and by encouraging hospital vaginal deliveries of all primigravida, grand multiparous women, provided adequate fetomaternal monitoring and operative facilities are available round the clock.

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