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Elective Versus Emergency Caesarean Section: Maternal Complications and Neonatal Outcomes

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Abstract
Background: *Emergency Caesarean birth in labour has been associated with an increased chance of infection, bleeding (increasing the need of blood transfusion) and Deep Venous Thrombosis when compared with both vaginal birth and elective caesarean birth*
Objectives*: to compare emergency and elective Caesarean section with regard to intra operative and post operative complications in both mother and child.*
Results: *The emergency CS rate was 1436/2060 (69.70%) and elective CS rate was 624/2060(30.29%). Maternal risk factors like anemeia and pre eclampsia and eclampsia were significantly associated with emergency CS. The major maternal complication in the emergency CS group were scar dehiscences, respiratory complication, febrile morbidity and mortality. The perinatal mortality rate in the emergency CS group is 44.5/1000 total births and 6.32/1000 births in the elective CS group.*
Conclusion*: Emergency CS was associated with significantly more maternal morbidity and mortality and adverse neonatal outcome as compared to elective CS.*

I. Introduction

Caesarean section is the most major surgical procedure performed now a days. Its rate varies internationally from 10 to 25 % [1]. Caesarean section (CS) used to be carried out primarily for obstetric indication. However lately, other factors, such as reduced risk to the mother as a result of improved anesthetic procedures and surgical techniques, elective caesarean section because of breech presentation, or previous caesarean section have contributed to change in obstetric practice and patient choice [2]. Caesarean delivery is a major surgical procedure and peri-operative complications remain a significant source of maternal and fetal morbidity and mortality [3]. Despite the low maternal mortality associated with Caesarean section, the available studies indicate a crude risk ratio of approximately 10 for maternal mortality with Caesarean section compared with vaginal delivery [4].

The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) has categorized Caesarean section into four categories depending on urgency. RANZCOG further recommends that there should be no specific time attached to the various types of caesarean section. Each case should be managed according to the clinical evidence of urgency, with every single case being considered on its merits [5].
Emergency Caesarean birth in labour has been associated with an increased chance of infection, bleeding (increasing the need of blood transfusion) and Deep Venous Thrombosis when compared with both vaginal birth and elective caesarean birth [3]. Indications such as cephalopelvic disproportion and fetal distress have been implicated in the rising rate of caesarean section in the tropics [6].This study was undertaken to compare emergency and elective Caesarean section with regard to intra operative and post operative complications in both mother and child.

II. Materials And Methods

This was a prospective study using between group comparisons over a period of one year conducted in the Department of Obstetrics and Gynecology, Medical College and SSG Hospital, Baroda. All subjects undergoing elective and emergency Caesarean were included over the study period.Subjects undergoing elective and emergency CS will be recruited. Elective CS is defined as that which is performed at a time to suit the woman and maternity team. Emergency CS is performed in labour due to immediate threat to life of mother or foetus. Data relating to socio demographic information, previous obstetric history, associated medical conditions index pregnancy characteristics, were collected for each case – maternal age, parity, presence of maternal risk factors, history of previous CS, indication of CS in current pregnancy, foetal presentation (Cephalic or non-Cephalic) spontaneous or induced labour, gestational age at delivery, oxytocin in labour, type of anaesthesia.

Maternal intraoperative and postoperative complications (Haemorrhage, need for blood transfusion, need for ionotropic support, renal, respiratory, febrile complications, damage to bladder or bowel, death) were documented.Neonatal outcomes such as birth-weight, Apgar score at 1 and 5 minutes, respiratory problems, admission to NICU, other neonatal morbidity and neonatal mortality were recorded.All data was collected, coded and entered into an excel sheet. Statistical analysis was performed using Chi-square test for non parametric variables.Ethical Clearance was obtained from the Institutional Ethics committee.

III. Results

During the study period, there was 2060 (29.9%) Caesarean Sections (CS), out of 6869 total deliveries. Of these, 624 were elective and 1436 were emergency. In elective CS 100% were booked cases, in emergency CS, 619 (43.1%) were booked. Among subjects who underwent emergency C.S, 721(50.21%) were primigravida and 297(47.60%) who underwent elective C.S. were 2nd gravid. Most of the subjects were in the gestational age group of 37-40 weeks - 480(76.92%) subjects in elective CS and 1025(71.38%) in emergency CS group.

Table-1 shows that Antepartum Haemorrhage contributed as the main maternal risk factor 82(5.71%) in emergency caesarean section, preEclampsia-75(5.22%) was 2nd in order and anaemia 45(3.13%) was 3rd in order. In elective Caesarean section the main maternal risk factor was ante partum haemorrhage (placenta previa) 25(4.01%), pre Ecampsia 14(2.24%) 2nd in order Anaemia 10(1.60%) 3rd in order. The association was significant at $p<0.0001$ for pre eclampsia and eclampsia as maternal risk factor and for maternal anemia at $P = 0.0477$.

Fetal distress was most common indication for emergency CS [672 (46.80%)]. Other indications for emergency CS were previous caesarean section 348(24.23%), cephalo pelvic disproportion 248(17.27%), failure to progress / Obstructed labour 139(9.68%). Most of the elective CS were done for cephalo pelvic disproportion 275(44.07%), previous caesarean section 153(24.52%), primi breech 109(17.47%) and oligohydramnios 71(11.38%).The association between elective CS and primi breech ($p<0.01$), cephalo pelvic disproportion ($p<0.0001$) and oligohydramnios ($p< 0.0001$) was statistically significant, whereas the association between emergency CS and abruption placenta ($p<0.01$) as maternal indication was statistically significant. Caesarean section for single indication was more in emergency group and CS for multiple indication was more in elective group. The observations were statistically significant at $p<0.0001$.

Table 3 shows that more number of subjects in emergency CS group required blood transfusion 70(4.87%). The major maternal complications in the emergency CS group were scar dehiscence in 11 subjects, respiratory complications 53 (3.69%), febrile morbidity 60(4.18%) and mortality in 6 subjects. The differences in proportion of complications was statistically significant for scar dehiscence, respiratory and febrile morbidity. The total complications in emergency group were 206 (14.34%), and in elective group 60(9.61%). This observation was statistically significant at $p<0.003$.

There were more complication events in the neonates born in the emergency group 301/1460 (20.6%) as compared to the neonates in the elective group 106/632 (16.77%). Meconium aspiration syndrome (MAS) was seen in 73 neonates in emergency CS group as compared to 3 in elective group. This difference was statistically significant at $p<0.0001$. Admission to NICU was required in 215 in emergency group versus 51in elective group ($p<0.0001$). There were 40 neonatal deaths in the emergency CS group and 4 in the elective group ($p<0.001$). There were 25 still births in the emergency CS group and none in the elective group. The denominator in the emergency CS group in this table is 1460 neonates, including twins. The perinatal mortality rate in the emergency CS group is 44.5/1000 total births and 6.32/1000 births in the elective CS group.

IV. Discussion

The rate of caesarean section was 29% in this study; the emergency CS rate was 1436/2060 (69.70%) and elective CS rate was 624/2060(30.29%). Emergency CS was associated with significantly more maternal morbidity and mortality and adverse neonatal outcome as compared to elective CS. Maternal risk factors like anemeia and pre eclampsia and eclampsia were significantly associated with emergency CS. The observations of our study are supported by other studies.

Daniel Suja et al (2014) [1] stated that most of elective caesarean section were done for previous caesarean section (78.9%) and malpresentation (14.5%). In emergency caesarean section group fetal distress (30.3%), previous caesarean section (18%) and failed induction (18%) were the main indications. Suwal Anupama et al (2013) [7] found that the usual indication of emergency CS were fetal distress, previous CS in labour, non progress of labour, and prolonged second stage of labour. The usual indication for elective CS were previous CS, breech, cephalo pelvic disproportion, and CS on demand. Naeem Mohammad et al (2015)[8] stated that indications for elective CS were previous CS n=16(34.0%), marked oligohydramnios n=6(13.0%), cephalo pelvic disproportion n=6(13.0%), pregnancy induced hypertension 5 (10.08%). Indications for emergency CS were fetal distress n=36 (21.9%), obstructed labour, failure to progress n=34(20.7%) and breech presentation

n=16 (9.7%). Daniel CN et al (2016) [9] stated that the most common indication for emergency CS were prolonged obstructed labour 25.7%(30/288) and pre eclampsia / eclampsia 10.7%(31/288),while the least indications were fetal malpresentation and breech at term 1.5%(4/288).

Santhanalakshmi et al (2015) [10] stated that intra operative complications were mainly primary hemorrhage and bladder injury, which comprised of 9/104 cases (8.7%); the commonest complication in was wound infection (38%). Burshan et al (2015) [11] stated that morbidity in emergency CS was higher than elective CS group (46.9% versus 24.4%) and this difference was statistically significant p=0.0001.

M Sowmya et al (2014) [12] found a perinatal mortality of 12%. There were 88% live babies in emergency group as against 100% live babies in elective group. There were 6% Still Birth and 8% Intra Uterine Death in emergency Caesarean Group. There is statistically significant association between outcome and type of operation (p=0.05). Karlstrom A et al (2013) [13] stated that respiratory distress was the most common infant complication with a prevalence of 2.7% and occurred more frequently with emergency Caesarean Section.This study concludes that Emergency CS was associated with significantly more maternal morbidity and mortality and adverse neonatal outcome as compared to elective CS.

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Table-1: Distributin of Subjects by Maternal Risk Factor

	Elective (n-624) N(%)	Emergency (n-1436) N(%)	P value
Anemia	10(1.60)	45(3.13)	P = 0.0477
Pre eclampsia	14(2.24)	75(5.22)	P < 0.0001
Eclampsia	0	41(2.86)	
Sickle Cell Trait/Disease	6(0.96)	21(1.46)	P = 0.3589
Hypothyroidism	3(0.48)	14(0.97)	P = 0.2577
HBsAg Reactive	2(0.32)	8(0.55)	P = 0.4879
Antepartum Hemorrhage (APH)	25(4.01)	82(5.71)	P = 0.1102
Gestational Diabetes/Type2 Diabetes	3(0.48)	4(0.28)	P = 0.4741
OTHERS (Heart Disease, Epilepsy, Asthma, Falciparum Malaria, Neurofibromatosis etc.)	7(1.12)	18(1.25)	P = 0.8042

Table-2: Distribution of Subjects by Indication of CS

	Elective (n-624) N(%)	Emergency (n-1436) N(%)	Chi Square Value (p-value)
Primi Breech	109(17.47)	53(3.69)	<0.001
Previous LSCS	153(24.52)	348(24.23)	0.9322
Placenta-praevia	21(3.37)	48(3.34)	0.9216
Abruptio placentae	3(0.48)	37(2.58)	<0.01
Cephalo Pelvic Disproportion	275(44.07)	248(17.27)	<0.0001
Malpresentation	44(7.05)	103(7.17)	0.9967
Multiple Pregnancy	8(1.28)	24(1.67)	0.6426
Fetal Distress	0	672(46.80)	-
Oligo Hydramnios	71(11.38)	59(4.11)	<0.0001

Failure to Progress /Obstructed Labour	0	139(9.68)	-
Failed Induction	0	10(0.69)	-
Others	3(0.48)	7(0.49)	0.7532

Table-3: Distribution of Subjects by Maternal Complications

Complications	Elective (n=624) N (%)	Emergency (n=1436) N (%)	P value
Need for Blood Transfusion	32(5.13)	70(4.87)	P = 0.8026
Scar Dehisence/ Rupture	0	11(0.77)	P = 0.0280
Need for ionotropes	1(0.16)	3(0.21)	P = 0.8131
Respiratory Complication	13(2.08)	53(3.69)	P = 0.0566
Bladder/ Bowel Injury	1(0.16)	3(0.14)	P = 0.9130
Febrile Morbidity	12(1.92)	60 (4.18)	P = 0.0103
Paralytic Ileus	1(0.16)	0	P = 0.1296
Mortality	0	6 (0.42)	P = 0.1050
Total Complications	60 (9.6)	206(14.34)	P=0.003

Table-4: Distribution of Subjects by Neonatal Outcome

Neonatal Outcome	Elective (n=632) N (%)	Emergency (n=1460) N(%)	p –value)
Transient Tachypnea of Newborn (TTN)	23(3.69)	64(4.46)	0.4931
Meconium Aspiration Syndrome (MAS)	3(0.48)	73(5.08)	<0.0001
Respiratory Distress of Newborn (RDS)	19(3.04)	56(3.90)	0.4025
Admission to NICU >24 hrs	51(8.17)	215(14.97)	<0.0001
Sepsis	4(0.64)	18(1.25)	0.309
DIC	2(0.32)	4(0.28)	0.7753
Still Birth	0	25(1.74)	-
Neonatal Mortality	4(0.64)	40(2.79)	<0.001