Maternal And Neonatal Outcome In Elective Versus Emergency Cesarean Section In A Tertiary Healthcare Centre In Ahmedabad, Western India

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Abstract:

Introduction:

Caesarean section is one of the most commonly performed surgical procedures all over the world. The aim of the present study was to determine the maternal and neonatal outcome and complications in two groups of pregnancy among women with elective and emergency cesarean section. Various studies show that increasing trends on this mode of delivery world-wide is leading to an increase in its associated risks and cost to the mothers.

Material and Methods:

A retrospective observational study carried out in the Department of Obstetrics and Gynecology, Sheth V.S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellis Bridge, Ahmedabad, Gujarat, a tertiary health-care center in Western India. All patients who underwent caesarean section are divided into two groups as per the timing of procedure in emergency or electively. The two groups were compared on the basis of indications of operation, intra operative & post op complications, and maternal and fetal outcome.

Results:

The incidence of caesarean section was 42.8%. The proportion of elective and emergency caesarean was 33.3% and 66.7% respectively. The complications were significantly higher in the emergency group in terms of both maternal and fetal outcome.

Conclusion:

Caesarean section (C.S) is a part of the standard care in modern obstetrics. The indications for a caesarean section as an alternative to vaginal delivery have evolved over the centuries. Its practicality, disponibility, and apparent safety have placed caesarean section, a first-line procedure in many clinical scenarios. The awareness of perinatal mortality and morbidity associated with safety of caesarean, expert anaesthesia, potent antibiotics, blood transfusion facilities and better neonatal care have increased incidence of caesarean section very fast. Thus, there is a fast, steady and definite rise in incidence of caesarean section everywhere. But the question is 'Is a rising caesarean section rate is inevitable?'. But our study shows that there are definitely more maternal and neonatal morbidity and mortality in the emergency cesarean section compared to elective cesarean section.

Keywords—Cesarean Section, Elective, Emergency, Complications in cesarean, Morbidity and mortality

Introduction:

"The art of surgery has not replaced the older art of obstetrics; it has only softened it, for it is of gentler kind." Marshall, 1955.[1]

Cesarean delivery is the birth of a fetus via laparotomy and then hysterotomy. Depending upon the mode of operation, it is divided into elective and emergency cesarean section (cs). Cesarean section is associated with increased risk of maternal and perinatal morbidity and mortality in comparison to vaginal delivery.[2] It is seen that morbidity and mortality are associated more with emergency cesarean sections than with elective ones[3,4]. According to WHO, the cs rate should be in between 10-15% as rate above this has not shown any improvement in the maternal and perinatal outcomes[5]. Recently, there has been an alarming increase in the rate of cesarean section globally, predisposing women to increased risk and cost of the surgery. According to the latest data from 150 countries, currently 18.6% of all births occur by cesarean route, ranging from 6% to 27.2% in the least and most developed regions, respectively. Based on the data from 121 countries, the trend analysis showed that between 1990 and 2014, the global average cs rate increased 12.4% (from 6.7% to 19.1%) with an average annual rate of 6 increases of 4.4%. In our centre, the cesarean rate is around 40% from the annual records and now no studies have been done to evaluate the maternal and perinatal outcome. So this study aims to compare maternal and perinatal morbidities in elective and emergency cesarean sections in a tertiary care centre.

Material and Methods:

The present study is a retrospective computer based data analysis for comparative study of maternal and neonatal outcome in elective vs emergency cesarean section, conducted in the Department of Obstetrics and Gynecology, Sheth V.S. General and Sheth C.M. Hospital, Smt. N.H.L Municipal Medical College, Ellis Bridge, Ahmedabad, Gujarat, a tertiary health-care center in Western India. The study was conducted from January, 2018 to December, 2018.

Cesarean section delivery was classified as elective if the decision to perform the operation was made before the onset of labor and after preoperative preparation at a prearranged time during office hours to ensure best quality of obstetric, anesthetic, neonatal, and nursing services even when labor started before the operation (regular contraction with cervical dilatation). All others were considered as emergency cesarean deliveries.

Detailed data regarding indication of cesarean section- elective or emergency, complications during intrapartum and postpartum period, Neonatal morbidity and mortality, etc. was collected and analyzed, presented in the study.

Results

Table 1(below) shows our obstetrics and gynecology department outcome of the last four years.

As our institute is situated in the center of the city of Ahmedabad and connected by national highways in vicinity we cater medical services to about 10 million population. As institute is well equipped with all specialty and super-specialty facilities and obstetric ICU care, SNCU (Special Newborn Care Unit) care in the department, we receive every type of emergencies like post-partum hemorrhage, eclampsia, ruptured uterus, obstructed labour, illegal abortion and septisemia, pregnancy with hepatitis, with medical conditions like cardiac diseases, renal conditions, severe anemia, thyroid disorders etc. Many times we receive serious mothers from rural areas of Gujarat and other western Indian states like Rajasthan, Madhyapradesh, etc , too. All types of obstetrics services and management including admission, surgery, blood transfusion etc. to the mother and baby, are free of cost for any pregnant patient from her first visit to 42 days postpartum and for the baby upto 1 year of age under the Government of India scheme- JSSK (Janani Shishu Suraksha Karyakram).

Overall, 3725 cases of cesarean section were carried during the study period among a total of 8843 births. Cesarean section deliveries accounted for 42.8% of all births. There were a total of 1241 (33.3%) elective cesarean sections. There were no differences in the experiences of surgeons compared to the operative techniques. Even though being a teaching institute, the cesarean rate is higher according to WHO guidelines. But we receive high risk referred cases from every parts of our city as well as the state of Gujarat and others, too.

Most of the mothers who underwent cesarean section were operated under regional anesthesia, while general anesthesia was given to 2.4% of mothers who were high risk for regional anesthesia.

Table: 2 (below)

Most common indication for elective cesarean section was previous cesarean delivery(24%), followed by cephalopelvic disproportion (23.2%), hypertensive disorders (14%), bad obstetric history(11.1%) etc.

Most common indication for emergency cesarean section was previous cesarean delivery(30.9%), followed by Fetal distress (13.9%),induction failure (13.5%), etc. Cases of previous cesarean delivery who were planned for elective LSCS started labor in emergency, so incidence of previous cesarean delivery is quite higher also.

Table 3(below)shows the various complications suffered by the respondents during their post natal period. No postpartum morbidity was observed in 1030 (73.7%) of the respondents, whereas 367 (26.3%) had reported some or other kinds of morbidities.Out of 454 Intraoperative complications, about 74% were found in emergency caesarean sections when compared to elective caesarean section (26%). Excessive hemorrhage was the commonest complication in both types of LSCS, followed by PPH. Other complications were anesthetic complications (4.5%) and transfusion reactions 3 (3.3%). Only 8 (0.57%) respondents had undergone obstetric hysterectomy for atonic PPH/ rupture uterus. 25 cases(1.8%) of bladder injury, due to previous 2 or more cesarean section, obstructed labor,rupture uterus, placenta previa and accreta, etc. were found during the period of study in both types of LSCS.

Postoperative complications were found to be associated more with emergency caesarean section 664 (48.6%) than elective caesarean section 249 (18.2%). Anemia was found to be the most common postoperative complication in both types of LSCS-343 (25.1%) cases followed by PPH 94(6.9%) and infections 217()15.9% - wound infection being the commonest (9.4%) followed by UTI in 59 (4.3%) , respiratory infection in 30(2.2%) cases . Other complications include postoperative fever 62(4.5%), prolonged catheterization 45(3.4%) and prolonged hospital stay 92(6.7%) for mothers.

India ,being adeveloping country, multiparity , malnutrition, illiteracy, anemia, poor resources and health facilities in remote areas, prematurity, low birth weight, high maternal and perinatal morbidity and mortality is common.

Due to prematurity, IUGR, multifetal pregnancy etc. low birth weight and complications as shown in **Table 4(below)** leads to poor APGAR Score and higher NICU admission, related morbidity and mortality.

Out of 3817 newborns, 3760 (97.5%) were born alive. Perinatal mortality in this study was 23.5 per 1000 births.71.4% of these deaths were of the emergency cesarean group. There was a significant difference in prematurity, respiratory morbidity in emergency cesarean compared with elective cesarean sections.

Sepsis/Pneumonia was the most common fetal complication, seen in 104 cases (2.7%) of which 87 (83.7%) were from the emergency cesarean group. Admission in neonatal intensive care unit was required in 18.54% of which 33.3% were in elective cesarean group and 66.6% were in emergency cesarean group.

Discussion:

Caesarean sections have been long practiced as a lifesaving procedure for the mother and fetus. Though it is classified as a major procedure, the incidence of Caesarean section has risen considerably over the years. In June 2010, WHO stated that there is no empirical evidence for the rate it recommends, as it has been a debatable issue. Now the WHO recommends that caesarean section should be done only when it is needed.6 The situation now is that cesarean is adopted for even trivial cases. Though advances in the field have reduced maternal mortality considerably, the problems of maternal and fetal morbidity after cesarean still persist. The present study was undertaken to analyze the maternal morbidity associated with cesarean with particular emphasis on timing of the procedure.

It is known that unnecessary c/s do more harm than good. When everything is normal with the women cesarean section has an 8 fold higher mortality, 8-12 times higher morbidity and a higher incidence of complications than vaginal delivery.[5] Higher incidence of emergency cesarean is a major contribution for increased rate of maternal and fetal mortality and morbidity in caesarean deliveries.[6] In emergency cesarean maternal mortality and morbidity is high.[7] The current study shows the emergency CS rate 66.7% is higher than elective CS 33.3% and the most common indication for cesarean section is previous cesarean section in both emergency as well as elective. The study findings is in comparison to a study by Mc Carthy et al which showed an incidence of 64.14% emergency and 35.8% elective sections, and their most common indication was also previous

cesarean section.[8] Onankpa et al study reported cesarean section rates of 8.4%, of these 80.6% were emergency and 19.4% were elective.[9]

Incidence of previous CS pregnancy contributing to CS is high in our study as compared to other studies. However due to higher number of post CS pregnancies undergoing trial of labour there has been sharp decrease in CS proportion attributable to post CS pregnancies in 2017-18. Recent studies all over the world have shown repeat CS pregnancy as the main factor in rise of CS.[10] Our study showed repeat cesarean section (28.61%), cephalopelvic disproportion (11.9%) and fetal distress (9.3%) as the most common indications for caesarean section which are consistent with the study conducted by Lakshmi et al repeat cesarean (43%) was, this was followed by CPD (15%).[11] While in a study done by Chiheriya reported the caesarean section in emergency group (2521) was more than elective group (696) and the most common indication was previous LSCS in both the group,76.87% in elective and 46.44% in emergency group, followed by breech, oligohydromnios, placenta previa, wants cesarean section, for primary infertility, transverse lie, in both group respectively and meconium stained liquor, cephalopelvic disproportion, non-progress of labour, abruption placentae, failed induction respectively in only emergency group.[12] The increased incidence of repeat caesarean section in both groups was due to the absence of patients opting for vaginal birth after caesarean section. In our study there was a definite indication for undergoing cesarean section and none of the case was performed at maternal request.

It is well documented that caesarean section carries a much higher maternal mortality and morbidity as compared to a vaginal delivery.[12] Even though caesarean section is being performed for indications like foetal distress and many antenatal conditions; maternal morbidity continues to be very high among in caesarean section deliveries. The risk of maternal death after cesarean section is 5 times higher than normal vaginal delivery. But, the overall maternal morbidity rate in our study was 88 (36.7%) which is slightly higher than 20% reported from Jimma Hospital, Ethiopia.[13] While in a study conducted by Jain et al the maternal morbidity was seen in 18.5% of cases which was lower than the present study.[14]

In present study the intra operative complications were found to be associated more with Emergency cesarean (24.6%) than elective caesarean section (8.6%). The major complication that developed in both types of c/s was excessive bleeding (15.9%). In a study conducted by Ghazil et al also reported the same that intra operative complications were associated more with emergency caesarean section than with elective caesarean section. Excessive heamorrhage was the most common complication seen in their study.[15] A study from Lahore showed that intra operative haemorrhage was the most common complication in C/S being responsible for two maternal deaths in their study.[16] Only 8 (0.57%) respondents had undergone obstetric hysterectomy for atonic PPH. There were 25 (1.8%) cases of bladder injury reported during the study period.

Our study findings revealed that, postoperative complications were found to be higher in emergency caesarean sections (43%) when compared to elective caesarean section (26.2%) such as anemia, postpartum hemorrhage (PPH), fever, wound sepsis, upper respiratory tract infection and urinary tract infection. The commonest postoperative complication was anemia in 18.2% cases of emergency caesarean section group, while in elective caesarean section group anemia found in only 6.7 % cases followed by PPH in emergency (9.0%) & elective cesarean (2.2%) and findings were consistent with the study conducted by Mehnaz Raees et al found anemia in majority of cases among patients in emergency c/s groups followed by PPH in emergency & elective c/s.[17] Other postoperative complications were infections (15.8%), prolonged catheterization (3.3%) and postoperative fever (4.5%). An international study reported that the postoperative morbidity were 35.7%, most frequent was fever (24.6%) followed by blood loss (4%) hematoma (3.5%) and UTI (3%). Among these PPH remains the major cause of maternal mortality.[18] Another study conducted by pomela et al reported that postoperative complications were more in patients who had emergency CS compared with patients undergoing elective CS such as fever (26.0% and 16.1%), wound infection (12.7% and 6.5%) and urinary tract infection (14.3% and 5.4%).[19]

The study finding showed that women who underwent emergency caesarean section (5.4%) had longer hospital stay as compared to elective caesarean section group (1.3%) and this was significant as duration of hospital stay was one of our study criterions to assess the maternal morbidity. In a study conducted by Daniel found that in the elective CS group 96.1% had hospital stay for 6 days and 92.1% of the emergency group, had hospital stay of 6 days.[20] In an another study also it was found that postoperative hospital stay was significantly prolonged in patients who had undergone emergency caesarean

section when compared to elective caesarean section.[21]

Currently there is no evidence that elective caesarean is safer than vaginal delivery. In fact, most evidence indicates that caesarean section has much higher risk than normal labour. Therefore, obstetric care providers should continue to advocate for vaginal delivery as the optimal mode of birth.[22]

Overall, fetal complications were higher in emergency cesarean group. The major cause of fetal morbidity were respiratory morbidity and sepsis seen mainly in emergency group. Prematurity, birth asphyxia, respiratory morbidity, and admission in neonatal intensive care unit were significantly more frequent in emergency cesarean group than in the elective cesarean group. Other studies have reported similar facts [23, 24, 25]. De Luca et al. found in their study that there was less fetal morbidity in elective cesarean group than in emergency cesarean group section but perinatal mortality and respiratory morbidity were similar in both groups [26]. This was contrary to the findings of Miller et al. [27]. They reported in their study that birth asphyxia was less common in emergency cesarean section than in elective cesarean section. This is difficult to explain except for thefact that in their study emergency cesarean section was most often carried out to save the fetus. Besides, transient tachypnea of thenewborn may follow cesarean section, especially if it is elective cesarean section. A debate exists as to whether cesarean section delivery contributes to the genesis of this disease. Kamath et al. compared elective repeat cesarean delivery and vaginal birth after cesarean and concluded that neonates born after elective repeat cesarean delivery have significantly higher rates of respiratory morbidity and admission in neonatal intensive care unit [28]. However, Lopez et al. found opposite results in their study [29].

Roth-Kleiner et al. found that severity of respiratory morbidity was higher in newborns after elective cesarean section than in emergency cesarean section, probably because of the changes occurring to the fetal lungs when the mother gets into labor [30]. Those findings do not correlate with ours though. Moreover, elective repeat cesarean section has been implicated in the development of pulmonary hypertension of the newborn [31]. Furthermore, a common cause of fetal complications is infant respiratory distress syndrome which is a function of gestational age [32].Inappropriately timed cesarean delivery has been known to result in this complication. According to a study by Morrison et al., a significant reduction in neonatal respiratory morbidity can be obtained if elective cesarean section is performed during the 39th week of pregnancy [33]. Perinatal mortality was 23.5 per 1000 births. There were 3 early neonatal death in this group due to hypoxic encephalopathy, as also found in Cebeku et al. study [34]. This was in spite of the fact that all antenatal complications that might predispose to adverse fetal outcomes were excluded from the study. Studies from developed countries have reported a perinatal mortality for cesarean section deliveries of less than 10 per 1000 births [35]. In developing countries, Onankpa et al. reported that perinatal mortality was 11 per 1000 among the cesarean deliveries[36].

“Our journey to the Moon or Mars maybe safe, but a fetus journey- a journey of only 6 inches through the maternal pelvis is not always safe, for both mother or baby.” [37]

Conclusions:

The indications for the caesarean section have changed throughout history. They have been shaped by religious, cultural, economic, professional, and technological reasons that have impacted medicine. CS originated as a precept for saving the soul, if not the life of the fetus. From the nineteenth century it changed to save the obstetric patient. Finally, since the end of twentieth century, Western obstetric medicine has focused on the maternal and fetal benefits of the procedure.In the last 30 years, the fetal indications of the procedure have triggered its frequency with a definite impact on the model of modern obstetric practice.

Acknowledgments:

Authors would like to thank

Mr.Dipesh Manishkumar Patel, Biology major student, Penn state University Park, State College , PA , U.S.A. For study Design.

Nidhi H Desai, School of Visual Arts and Design and Social Innovations , MFA, DSI course, 23rd Street, Manhattan, NY, U.S.A. and

Dr.Vismay B Patel, 330, Angelo Cifelli Dr, Apt.239, Harrison NJ 07029, U.S.A. for their motivation and guidance for data analysis and presentation of this study.

Special thanks to Dr.Jayendra R. Gohil, MD (Senior Professor of Pediatrics and Neonatology), Government Medical College, Bhavnagar, Gujarat for his special suggestions regarding neonatal care.

Declaration:

Funding: not taken

Conflict of interest: None Declared

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Table 1: Data of Labor room of our Institute from January 2018- December 2018

	2015	2016	2017	2018
Total Delivery	8720	9542	9242	8843
Vaginal delivery	5242	5812	5268	5118
Cesarean Delivery	3478	3730	3974	3725
Multi-Fetal Pregnancy	266	285	151	131
Breech	255	178	191	236
Still Birth	277	299	263	204
Obstetric Hysterecotmy	10	3	6	13
Maternal Death	20	18	15	27
Male child	4644	5074	4878	4713
Female child	4340	4781	4514	4265

Table 2: Indications for Cesarean Section

Indication for Cesarean	Elective	Emergency	Total
Fetal Indications			
Fetal Distress	0	346 (100%)	346
Multifetal Pregnancy	34 (37.8%)	56 (62.2%)	90
Fetal Macrosomia	10 (19.2%)	42 (80.8%)	52
Severe IUGR	61 (75.3%)	20 (24.7%)	81
Post-term	32 (15.2%)	179 (84.8%)	211
Placental/Membrane indication			
PROM (>48 hours)	0	22 (100%)	22
Placenta Previa	6 (24%)	19 (76%)	25
Placental Abruption	4 (12.5%)	28 (87.5%)	32
Cord Prolapse	0	11 (100%)	11
Severe Oligohydramnios	12 (12.6%)	83 (87.4%)	95
Dystocia Indications			
Cephalopelvic Disproportion	288 (65%)	156 (35%)	444
Induction Failure Non progress of Labor	0	335 (100%)	335
Breech Presentation	87 (66.4%)	44 (33.6%)	131
Other Malpresentation	9 (23%)	30 (77%)	39
Maternal Indications			
Previous Cesarean Delivery	299 (28%)	767 (72%)	1066
History of miscarriage, perinatal death, or infertility	138 (74.2%)	48 (25.8%)	186
Severe pre-eclampsia, eclampsia, or HELLP syndrome	174 (39%)	273 (61%)	447
Other Maternal illness (Diabetes, Cardiac, Thyroid etc.)	87 (77.6%)	25 (22.4%)	112
Total	1241 (33.3%)	2484 (66.7%)	3725 (100%)

Table 3 : Maternal complications associated with cesarean section

Complications	Elective	Emergency	Total
Nil Complications	1030(73.7%)	1328 (57.0%)	2358(63.3%)
With complications	367(26.3%)	1000(43.0%)	1367 (36.7%)
Total	1397	2328	3725
A) Intra-operative Complications			
Hemorrhage	63(4.5%)	156(11.4%)	220 (15.9%)
PPH	15(1.1%)	79(5.8%)	94(6.9%)
Complications from anesthesia	15(1.1%)	47(3.4%)	62 (4.5%)
Transfusion reactions	15(1.1%)	30(2.2%)	45 (3.3%)
Bladder Injury	9(0.6%)	16(1.2%)	25 (1.8%)
Hysterectomy	1(0.07%)	7(0.5%)	8 (0.57%)
Total	118 (8.6%)	336(24.6%)	454(33.2%)
B) Post-operative Complications			
Anemia	94 (6.7%)	249(18.2%)	343 (24.9%)
Postpartum Hemorrhage	31 (2.2%)	123(9.0%)	154 (11.2%)
UTI	19 (1.4%)	40(2.9%)	59(4.3%)
Upper respiratory tract infection	8(0.6%)	22(1.6%)	30 (2.2%)
Wound Infection	52 (3.8%)	76(5.6%)	128 (9.4%)
Postoperative Fever	15 (1.1%)	47(3.4%)	62 (4.5%)
Prolonged catheterization	12(0.9%)	33(2.4%)	45(3.3%)
Prolonged Hospital stay	18 (1.3%)	74 (5.4%)	92 (6.7%)
Total	249 (18.2%)	664 (48.8%)	913 (66.8%)

Table 4: Newborn Characteristics

Newborn Characteristics	Elective Cesarean (n- 1241) Total Babies (n- 1272)	Emergency Cesarean (n-2484) Total Babies (n- 2545)	Total LSCS (n-3725) Total Babies (n- 3817)
Male	722	1417	2139
Female	550	1128	1678
Still Birth	16	41	57
Birth weight <2500 gm	601	989	1590
Birth weight >2500 gm	1785	442	2227
<37 weeks gestation	504	666	1170
>37 weeks gestation	1528	1119	2647
Perinatal Mortality	26	65	91
Poor APGAR Score	22	48	70
Admission in NICU	236	472	708

SNCU (Special Newborn Care Unit)			
Respiratory distress	**19**	**43**	**62**
Meconium Aspiration	**5**	**20**	**25**
HIE	**3**	**9**	**12**
Sepsis/Pneumonia/Meningitis	**17**	**87**	**104**
Congenital Anomaly	**1**	**4**	**5**
Jaundice	**132**	**141**	**271**
Hypothermia	**10**	**13**	**23**