

Original research article

## A Comparative Study of Maternal Morbidity and Mortality in Patient Undergoing Elective and Emergency Caesarean Section

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### Abstract

**Background:** In spite of its importance there are not many studies on maternal morbidity and mortality with perinatal outcome in patients undergoing elective or emergency caesarean section. Most of the literatures available are either maternal morbidity or perinatal outcome and of other states. The present study was undertaken to know the effect of caesarean section on maternal and perinatal outcome. Caesarean section is the surgical intervention in case of serious delivery complications. This surgical procedure has been saving lives for a long period of time. The concern for the caesarean rates is due to its rapid increase over the period.

**Methods:** This is prospective study was carried out on 300 patients undergoing caesarean section, both elective and emergency and their newborns in the Department of Obstetrics and Gynaecology in Darbhanga medical college and Hospital, Darbhanga. The procedure of the study was explained and required consent for the study was taken. Examination of the patient was done and all relevant data was obtained. Details of indications for caesarean section, nature of operation,

**Conclusion:** Caesarean section rate can be reduced by combined efforts at all levels and by encouraging hospital vaginal deliveries of all the primigravida, grand-multiparous pregnant women and those who had previous caesarean section, provided adequate fetal monitoring and operative facilities are available.

**Keywords:** Caesarean section, perinatal, emergency, elective, complications.

### Introduction

Caesarean section can be considered one of the earliest forms of modern birth technology. In the 20<sup>th</sup> century there have been many new developments in the field of medicine rendering increased safety to all surgical operations, which is mainly due to the availability of antibiotics, safe anesthesia and blood transfusion facilities. The same applies to caesarean section also, which has become an accepted standard procedure among the modern obstetric procedures reducing maternal morbidity and mortality. This definition does not include removal of the fetus from the abdominal cavity in the case of rupture of uterus or in case of an abdominal pregnancy. This definition also excludes vaginal caesarean section (old term) or vaginal hysterotomy in which the transvaginal access to the fetus was achieved by incising the anterior lip of the cervix and the lower uterine segment. All over the world c-section birth rates are rising. In some countries, like Brazil or Taiwan, caesarean birth rates are skyrocketing up to 60%, because giving birth this way is considered to be fashionable. In the USA more than one million women, 1 in 3, give birth by caesarean every year. The overall caesarean delivery rate increased progressively in U.S each year between 1965 & 1988, rising from 4.5% of all deliveries to

almost 25%. In response to this increase, the United States public Health Service (1991) set a goal of an overall 65% caesarean rate for year 2000. From 1970-2007, the caesarean delivery rate in the United States rose from 4.5% of all deliveries to 31.8%. This increase has been steady. Between 1989 and 1996, the rate of caesarean delivery decreased in United States. This was in large part due to increased vaginal birth after prior caesarean and to a lesser extent a small decrease in primary caesarean rate. C-section rate has been steadily rising from 35% in 2000 to 40% in 2005. According to WHO, the C-Section should be restricted to 10-15% to have a healthy maternal and infant environment. A study by WHO, which reviewed 110,000 births from nine countries in Asia during 2007-2008, 27% births were by C-section. Since 1985, WHO recommended a 10-15% of C-Section rate in developing countries. In India, the incidence of caesarean section is 10-15%. However, the rate of caesarean delivery has increased in the most recent years and in institutional deliveries, the caesarean section rate is as high as 30%. There seems to be a 'caesarean temptation', that is to say the temptation to make the caesarean the most common way to give birth. The caesarean birth is no longer a rare rescue operation. Caesarean birth tends to become the norm, at least in some countries. In some cases, C-section was because of the lack of patience on the part of the patient or her physician. The physician factor in caesarean section was obvious from a study involving 11 physicians from a single institute where the caesarean rate varied from 19.1% to 42.3% depending on the physician's outlook and judgment. According to the American College of Obstetrics and Gynecologists (2000), the highest variation occurs among nulliparous women with term singleton fetuses with cephalic presentation and without other complications. High-risk patients have much lower variation in caesarean delivery rates between practitioners and hospitals. The maternal and fetal morbidity and mortality varies according to the type of caesarean section done. Naturally it is more in the emergency caesarean section. developed countries maternal mortality is at the lowest. Now constant efforts are being made to bring down the perinatal mortality. Consequently many of the indications for caesarean section are solely concerned with the interest of the infant (i.e., in the exclusive interest of the baby, the caesarean section is being resorted to more readily). Recently an increase rate of the caesarean section is reported. With the growing emphasis on the antenatal and intrapartum status of the fetus and with the addition of laboratory status and technical progress of internal fetal monitoring, an increased rate of caesarean section should be expected. However, there must be an optimal rate of caesarean section in which the maternal risks are in balance with the benefits of the fetus.

### **Objectives**

To do a clinical study in the patients undergoing elective and emergency caesarean section with respect to maternal morbidity, maternal mortality, fetal morbidity.

### **Review of Literature**

The WHO published guidelines regarding caesarean rates in 1985 which was revised in 1994. The guidelines states that the proportion of caesarean births should range between 5% and 15%. It is mentioned in the guidelines that no additional benefits accrue to the perinates or the mothers when the rate exceeds the level. If we take this as our guideline the scenario of the caesarean rate over the world is quite alarming. Both the developed and the developing countries are not showing a satisfactory mark for the rates. The level of caesarean section is well above the WHO (1985) mentioned 15% mark for many of the countries, and it is increasing over the time. scenario where the access to obstetric care is growing day by day, there has been a great concern over the rising trends in caesarean section over the world. Caesarean section is the surgical intervention in case of serious delivery complications. This surgical procedure has been saving lives for a long period of time. The concern for the caesarean rates is due to its rapid increase over the period. India is also not excluded from this

trend. The estimate of CS rates in India is 7.1% in the year 1998 and 16.7% in the year 2006. In India, the emergency obstetric care provided to the patients is not uniform over the geographical spread. It is different for urban and rural regions and it is even different for different states of India. The providence of the emergency obstetric care and its efficiency results into the health of the concerned women and her baby. Caesarean section is almost certainly one of the oldest operations in the surgical field and it was initially employed in the hope of obtaining a living child when the mother was dead or dying, so the maternal survival was not a practical consideration. Caesarean section is also known as „sectio caesartea“ or „partus caesaricus“. Caesarean section is a procedure which has been and still is of great interest and controversy. Prior to year 1500, Lex Regia: Caesarean sections have been done ever since man began to record history. We find it mentioned in the Talmud and other ancient writings. The exact origin of the name is obscure. Popular belief is that the name is derived from Julius Caesar who, it is said, was delivered by this method. However, this fact is unsubstantiated. Gueniot reviewed the literature of the Eighteenth Century and found only six authentic cases. Between 1800- 1870, forty cases were reported and all died, giving a maternal mortality of 100 percent. However, An attempted version had been unsuccessful, so Oslander did a section, putting the left hand into the vagina, holding the head and cutting with the right hand. He opened the uterus in the lower segment, but did not suture it. Ritgen developed his operation which constituted an incision parallel to Pouparts ligament and opening the uterus in lower segment and the vagina vault. Baudelocque in France developed his operation, which was primarily a gastroelytrotomy, these latter two operations marking the beginning of the extra-peritoneal operation. Hibband had reported that in 1789, there was not a single mother in the city of Paris who had survived a caesarean section in the previous 90 years. In modern times the mortality rate attributable to the operation is reported to range from 0 to 5 per 1,00,000. Studies show that CS delivery is associated with a 5-fold increase in maternal mortality compared with vaginal delivery, after the exclusion of severe antenatal complications medical disorders, The lower segment scar offer a comparative safety because lower segment is still at rest till a very late stage during labour and is stretched later in pregnancy, whereas a classical scar is thoroughly jolted and agitated by physiological contraction and relaxation during pregnancy. So, classical scar rupture is dramatic and complete and usually occurs without any warning neither to the patient nor to the surgeon. Lower segment scar rupture is usually incomplete.

### **Material and methods**

This is prospective study was carried out on 300 patients undergoing caesarean section, both elective and emergency and their newborns in the Department of Obstetrics and Gynaecology in Darbhanga medical college and Hospital, Laheriasarai Darbhanga, Bihar. Study duration of two years. The study was conducted in 150 consecutive patients from elective group & 150 consecutive patients from emergency group, who underwent caesarean section. Most of the patients were registered in the OPD of our hospital.

### ***Inclusion criteria***

We have included all patients undergoing of caesarean section and their newborns.

### ***Exclusion criteria***

Normal vaginal delivery, Vaginal Birth After Caesarean (VBAC)

Detailed histories from the term gestation patients were taken. The procedure of the study was explained and required consent for the study was taken. Examination of the patient was done and all relevant data was obtained. Details of indications for caesarean section, nature of operation. , the patient's identity was obtained with emphasis on age, parity, obstetric history,

period of amenorrhoea and presenting complaints, any complaints involving cardiovascular, respiratory and renal system were noted. Relevant past and family history were noted. Menstrual history with emphasis on regularity of cycle and date of last menstrual period was taken.

In the obstetric history, history of previous pregnancy and labour was recorded in detail. A detail history of the previous caesarean section was also taken. A detailed obstetrical examination was conducted including fetal presentation. If previous caesarean section was done, then the nature of healing was noted by primary or secondary. Scar tenderness was looked for at each antenatal visit in the later part of the pregnancy. Results of the t-test: If the p-value associated with the t-test is small ( $< 0.05$ ), there is evidence to reject the null hypothesis in favor of the alternative. In other words, there is evidence that the means are significantly different at the significance level reported by the p-value. If the p-value associated with the t-test is not small ( $> 0.05$ ), there is not enough evidence to reject the null hypothesis, and you conclude that there is evidence that the means are not different.

## Results

**Table 1: Elective Caesarean section and Emergency Caesarean section**

Age in years	Elective C-S	Emergency C-S	Total
18-24	74(49.3%)	94(62.7%)	168(56%)
25-29	56(37.3%)	44(29.3%)	100(33.3%)
30-34	18(12%)	10(6.7%)	28(9.3%)
35 & above	2(1.3%)	2(1.3%)	4(1.3%)
Total	150(100%)	150(100%)	300(100%)
Mean $\pm$ SD	24.95 $\pm$ 4.02	23.70 $\pm$ 4.05	24.33 $\pm$ 4.08

$P=0.008$  Age distribution of patients who underwent Caesarean section

49.3% of patients are in the age group of 18-24 years and in Group B: 62.7% of patients are in the age group of 18-24 years. A statistically significant value of  $P=0.008$ , is obtained suggesting most of the patients undergoing C-section (elective/emergency) are in age group of 18-24 years. Strongly significant ( $P$  value:  $P < 0.01$ )

**Table 2: Period of Gestation**

Gestation age	Elective C-S	Emergency C-S	Total
32-36	30(20%)	34(22.7%)	64(21.3%)
37-39	99(66%)	86(57.3%)	185(61.7%)
40 & above	21(14%)	30(20%)	51(17%)
Total	150(100%)	150(100%)	300(100%)

(Elective C-S), majority of them 99/150(66%) were in the gestational age of 37-39 weeks and in Group B (Emergency C-S) 86/150(57.3%) were in the gestational age of 37-39 weeks. In Elective C-section, the Preoperative Hb% was 10.81 $\pm$ 1.29 (Mean $\pm$ SD) and Postoperative Hb% was 9.65 $\pm$ 1.38 (Mean $\pm$ SD). The reduction in Hb% was 1.166g/dl which is statistically significant ( $P < 0.001$ ).

In Emergency C-section the Preoperative Hb% was 10.59 $\pm$ 1.41 (Mean $\pm$ SD) and Postoperative Hb% was 9.38 $\pm$ 1.32 (Mean $\pm$ SD). The reduction in Hb% was 1.201g/dl which is statistically significant ( $P < 0.001$ ). A statistically significant P value of  $< 0.001$ , is obtained suggesting most of the patients following C-section (elective/emergency) are associated with reduction in Hb%. The most common indication for C-section in 83/300 cases were Previous LSCS accounting for 27.7% cases of C-section. Out of 150 Elective C-sections, the indications in 47(31.3%),

17(11.3%) and 2(1.3%) cases were Previous LSCS, Previous 2 LSCS & Previous 3 LSCS respectively, accounting for total of 66/150(44%) cases. The 2<sup>nd</sup> common indication for Elective C-section was CPD, 45/150(30%). Out of 150 Emergency C-sections, the most common indication was Fetal distress, accounting for total of 56/300(37.3%) cases. The 2<sup>nd</sup> common indication for Emergency C-section was Previous LSCS, 36/150(24%) cases. Babies weighing 2.5kg or more in the Group A (Elective C-S) were 119(77.8%), whereas in Group B (Emergency C-S) were 97 (63.4%) with P value of <0.001. This indicates better ANC in the Elective Group. Low birth weight babies (<2.5kg) were 22.2% and 36.6% in Group A and Group B respectively (P≤0.001). Neonatal complications are more common in Emergency C-section accounting for about 48(31.4%) newborns with P=0.026\* compared to Elective group.

**Table 3: NICU stay of newborns delivered by Caesarean Section**

NICU stay	Elective C-S	Emergency C-S	Total
No	133(86.9%)	112(73.2%)	245(80.1%)
1-2 days	2(1.3%)	7(4.6%)	9(2.9%)
3-7 days	17(11.1%)	33(21.6%)	50(16.3%)
7-14 days	1(0.7%)	1(0.7%)	2(0.7%)
>14 days	0(0%)	0(0%)	0(0%)
Total	153(100%)	153(100%)	306(100%)

NICU stay were significantly more associated with Emergency C-S with P=0.002

### Discussion

Study is a comparative study of maternal morbidity, mortality and neonatal morbidity, mortality in patients who underwent caesarean section (elective/ emergency). the emergency C-section rates (62.7%) were more common in the age group of 18-24years than the elective C-section (49.3%) but in the age group of 25-29years the elective C-section rates (37.3%) were common than the emergency C-section rates (29.3%). In the age group of 30-34years the elective C-section rates 18(12%) were common than the emergency C-section rates 10(6.7%) but in the age group of 35 and above both elective C-section and emergency C-section rates were same (1.3%). Pregnancy is the most important period in the life of a woman or family and a society, extraordinary care is therefore given by the healthcare system of most countries. Antenatal care is the care of the woman during pregnancy whose primary aim is to achieve healthy mother and the healthy baby. Antenatal care is the major component of integrated maternal health within the reproductive health concept. Maternal and neonatal complications during the perinatal period are highly associated with non-utilization of antenatal and delivery care services and poor socioeconomic conditions of the patient. These complications were more common with unbooked than booked patients. In developing countries there is an increase in the morbidity and iatrogenic prematurity due to elective caesarean delivery at 37-38 weeks which is associated with increased cost of admissions in the newborn special care units. Therefore, unless there is an evidence of fetal lung maturity elective caesarean delivery should not be advised at or before 39 weeks of gestation. At 39 completed weeks of gestation, elective caesarean delivery is associated with better fetal outcomes than at 37-38 weeks of completed gestation. The elective caesarean delivery is usually performed at the time which is suitable for the obstetrician and the patient. Elective caesarean is usually performed at 37 weeks onwards, as at this time fetus is considered to be fully mature. Among the different adverse perinatal outcomes observed in obese women, a consistent increase in the incidence of Caesarean section has been associated with increased BMI or degree of obesity. Higher BMI was also found to be associated with earlier decisions to perform a Caesarean section in the second stage of

labour. Women with an increased BMI are managed differently in labour than women of normal weight. 63 patients in Elective C-S had BMI ranging between 24.9-29.9kg/m<sup>2</sup> when compared to only 35 patients with similar BMI in Emergency C-S. Overweight patients underwent more Elective C-S when compared to Emergency C-S. 46 patients in Emergency C-S had BMI ranging between 30-40 kg/m when compared to only 20 patients with similar BMI in Elective C-S. Obese patients underwent more Emergency C-S when compared to Elective C-S. Duthie et al- used alkaline haematin method to measure blood loss in forty women with singleton pregnancies undergoing lower segment C section and general anaesthesia. The mean measured blood loss was found to be 487 ml (range 164ml – 1438ml) and was estimated by the observer by reasonable accuracy In Elective C-section, the pre-operative Hb% was 10.81±1.29 and post-operative Hb% was 9.65±1.38. The reduction in Hb% was 1.166g/dl which is statistically significant (P=<0.001). the most common risk factor is previous LSCS. 42(28%) patients had previous LSCS in Elective C-section and 21(14%) patients had previous LSCS in Emergency C-section. The second most common risk factor in Elective C-S (5.3%) and Emergency C-S (4.7%) was known case of Hypothyroidism. Low birth weight constitutes as 60-80% of the infant mortality rate in developing countries. Infant mortality due to low birth weight is usually a direct cause stemming from other medical complications such as preterm birth, poor maternal nutritional status, lack of prenatal care, maternal sickness during pregnancy and an unhygienic home environment. According to an analysis by University of Oregon, reduced brain volume in kids is also related to low birth-weight. Fogelson et al. (2005) and Kamath et al. also observed more elective repeat C-section babies were admitted to the NICU Tita et al. reported early delivery (before 39 weeks) for elective C-section in the United States was associated with an increase in admission to NICU. Fallah S reported that, the period of stay in NICU of the newborns delivered through C-section (after excluding multiple births, preterm births, small for gestational age births and those delivered by women with select complications) they found that newborns delivered by C-section were more likely to be admitted to an NICU within 28 days of birth than those delivered vaginally.

### Conclusion

The factors associated with caesarean section are age, parity, multiple pregnancy, maternal weight gain, and birth weight. Including these factors the caesarean section is justified under certain circumstances such as cephalo pelvic disproportion and contracted pelvis, dystocia due to soft parts, inadequate uterine forces, antepartum hemorrhage, pre-eclamptic toxemia, eclampsia, fetal distress and prolapse of the cord, malpresentation, maternal distresses such as heart problems, bad obstetric history, habitual intrauterine death of the fetus and elderly primigravida. scenario when the access to obstetric care is growing day by day there has been a concern over the rising caesarean rates over the world. Caesarean section is the surgical intervention in case of serious delivery complications.

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