MATERNAL MORBIDITY ASSOCIATED WITH EMERGENCY VERSUS ELECTIVE CAESAREAN SECTION

Mehnaz Raees[1], Sumaira Yasmeen[2], Sadaqat Jabeen[3], Naeema Utman[4], Rukhsana Karim[5]

ABSTRACT

Objective: *To compare maternal morbidity in elective versus emergency caesarean section in a tertiary care teaching hospital.*

Methodology: *This comparative study was conducted at Department of Gynecology & Obstetrics, Lady Reading Hospital Peshawar, Pakistan, from July 2006 to June 2007. A total of 100 patients, 50 in emergency and 50 in elective caesarean section group through convenient sampling were included in the study. The sample size was calculated as 100 by keeping 8% prevalence of caesarean section in Pakistan and using WHO software for sample size estimation. The complications were compared in both groups using a semi structured proforma. The comparison was done by using Chi-square test and p-value≤ 0.05 was considered statistically significant.*

Results: *The mean age was 31.54±4.64 and 30.83±5.08 in emergency and elective caesarean section group respectively. Anesthesia related complications were only observed in 11 cases of emergency caesarean section group [Delayed recovery with 8 Cases occurred most] and none in the elective group. Tears in cervix and uterus were noted in 8 cases of emergency caesarean section group only. Hemorrhage was noted in 58% and 4% patients in emergency and elective caesarean section groups respectively. Postoperative complications were found higher in emergency caesarean section as compare to elective caesarean section groups like anemia (70%vs.40%), post partum hemorrhage(40%vs.6%), fever(30%vs.8%) and abdominal distention(30%vs.8%) with p-values of 0.004, 0.007, 0.01, 0.01 respectively.*

Conclusions: *The maternal morbidity including anesthesia related complications, Intra-operative, and post operative complications were more in the emergency caesarean section as compared to elective caesarean section group.*

Key Words: *Emergency caesarean section, Elective surgery, Maternal morbidity, Obstructed labor, Placenta previa*

This article may be cited as: Raees M, Yasmeen S, Jabeen S, Utman N, Karim R. Maternal morbidity associated with emergency versus elective caesarean section. J Postgrad Med Inst 2012; 27(1): 55-62.

INTRODUCTION

Caesarean section is a major obstetric operation. Caesarean section (C-section) involves making an incision in the woman's abdomen and cutting through the uterine muscles. The baby is then delivered through that incision[1]. It is usually performed when a vaginal delivery would put the baby's or mother's life or health at risk, although in recent times it has been also performed upon request for births that would otherwise have been normal[2].

The modern caesarean operation was developed between the late 19th century and the first three decades of the 20th century. During this period, three developments accounted for the reduction in maternal mortality from caesarean delivery from close to 100% to 2%. These three developments were the adoption of the use of uterine sutures to arrest hemorrhage, the adoption of aseptic technique, and changes in operative technique from the classical to lower-segment operations[3].

Compared to a vaginal delivery, maternal mortality and especially morbidity is increased with caesarean delivery. The overall maternal mortality rate is 6-22 deaths per 100,000 live births, with approximately one third to one half of maternal deaths after caesarean delivery directly attributed to a surgical procedure and, in part,

[1-5] Department of Gynecology & Obstetrics, Lady Reading Hospital, Peshawar - Pakistan

Address for Correspondence:
Dr. Mehnaz Raees,
Department of Gynecology & Obstetrics,
Lady Reading Hospital, Peshawar - Pakistan
E-mail: faisalrahim1972@yahoo.com

Date Received: April 20, 2012
Date Revised: November 7, 2012
Date Accepted: November 20, 2012

related to the conditions that may have led to needing to perform a caesarean delivery[4].

Caesarean section (C-section) rates are rising in many middle and high-income countries, with the justifications that higher rates of C-section are associated with better outcomes[5]. After excluding medical disorders and severe antenatal complications, the relative risk for emergency intrapartum compared with elective caesarean is approximately 1.7: 1.0[6].

Postpartum maternal morbidity associated with caesarean sections include, wound sepsis, post partum hemorrhage, endometritis, chest infection, septicemia, febrile morbidity, blood transfusion complications, abdominal distension and burst abdomen, prolonged catheterization, and urinary tract infections. Elective caesarean may reduce the incidence of emergency caesarean that is associated with high maternal morbidity and mortality[7]. Elective caesarean section is generally done around 39 weeks as the incidence of tachypnoea of the newborn is much less after this gestation. However, the medical or obstetric condition determines the gestation at which the elective caesarean section is planned – the main principle being to carry out the caesarean section as late as possible in gestation without compromising the maternal or fetal health[8]. When there is an immediate threat to the mother or the fetus an emergency caesarean section is performed.

The caesarean section rate of our unit is 22% of the deliveries and majority of them are performed in emergency situation to save mother and fetal life. So this study was intended to compare and analyze whether there is any significant difference in these complications in elective versus emergency caesarean section.

METHODOLOGY

This comparative cross sectional study was conducted at Department of Gynecology & Obstetrics, Lady Reading Hospital Peshawar, Pakistan from July 2006 to June 2007. Patients were admitted to the unit either from accident and emergency department of the hospital or directly from out-patient department of gynecology & obstetrics. Patients detailed history were taken and examinations done in the ward before inclusion in the study groups. Sample size was 100 using 8% prevalence of caesarean section in Pakistan, 95% confidence interval and 5% level of significance under WHO software for sample size determination. Of total 100 cases 50 patients were in each group. Sampling technique was convenient (non-probability) sampling. Grouping of the patients were done by using indications of caesarean section in each group (Table A).

Patients included in the study were between the age of 21 and 35 years, their hemoglobin level was more than 10 g/dl, patients with obstructed labor; placenta previa, patients with intra uterine fetal distress or other indications were included in the study after informed written consent by the husband or first degree close relative of the patient. While those patients who had previously sustained anesthesia related complications, patients with sepsis/septic shock, after pelvic assessment of the patients with favorable cervix (Bishop Score 6-13) who can be easily delivered vaginally, patients with other co existing gastrointestinal, cardiac or pulmonary disease and those not willing for the caesarean section were excluded from the study. The operating surgeon should have FCPS degree in Gynecology & Obstetrics or should have at least three years of post graduate training experience in Gynecology & Obstetrics unit in caesarean sections have done at least more than 30 caesarean sections independently. The ethical approval was taken from the Institutional Research and Ethics Board, Lady Reading Hospital Peshawar, Pakistan before starting this study.

After fulfilling inclusion criteria, the base line investigations of all patients included in the study were sent to the same laboratory to reduce the bias in the study results and ultrasonography from the hospital prior to operation was done in every patient. The Laboratory investigations of the patients in both groups had been checked and their preoperative hemoglobin (Hb) were kept more than 10mg/dl, and all these patients must had fitness for anesthesia and having no other co existing systemic diseases and the fitness of the patient by the cardiologist, chest physician, and general physician were a pre-requisite to undergo a surgery. In 50 elective cases and 50 emergency caesarean cases, caesarean section was performed. Intraoperative and postoperative maternal complications were compared in both groups using a semi structured proformas and the data was entered in SPSS Version 12, the results of the study were analyzed and comparison between two groups was done by using Chi-square test and the p-value ≤ 0.05 was considered significant. Results were depicted as tables.

RESULTS

In this study a total of 100 patients, 50 undergoing emergency and 50 elective caesarean section were included through convenient sampling from each group subsequently. The patients underwent C section following a clinical indication (Table 1).

Indications for performing caesarean section in group of emergency caesarean section

Table 1: Indications of Caesarean Section

Indications	Emergency Caesarean	Elective Caesarean
Placenta Previa	07	00
Obstructed Labour	07	00
Previous Caesarean Section (Cephalopelvic Disproportion/ Post Date)	06	17
Previous 2 Caesarean Section	02	17
Previous 3 Caesarean Section	01	03
Previous 4 Caesarean Section	00	01
Breach Presentation	04	01
Neglected Transverse Lie	03	00
Deep Transverse Arrest And Failed Vacuum	02	00
Fetal Distress	04	00
Cephalopelvic Disproportion	02	00
Secondary Contracted Pelvis	02	00
Twin With first Mal-presentation	01	01
Chorioamnionitis	01	00
Failure to Progress due to Different Reasons	04	00
Cord Prolapsed/Hand Prolapse	02	00
Post Dates	00	02
Low Biophysical profile + Systolic/Diastolic Ratio	00	03
Bad Obstetric History	00	05
Brow Presentation	01	00
Retained Second Twin	01	00
Total	**50**	**50**

showed that majority of patients 7 (14%) were having placenta previa and obstructed labour respectively. In the group of elective caesarean section, the commonest indications were previous caesarean sections. Majority of 41 (82%) patients in group of emergency caesarean section received general anesthesia. While in elective caesarean section group general anesthesia was given in only 15 (30%) cases (P=0.000) and spinal anesthesia was inducted in majority 33 (66%) cases (P=0.000).

The booking status is shown in Table 2.

The incidence of intra-operative complications of anesthesia in emergency caesarean section group were; difficult intubation found in 1 (2%) cases (P=1.00), regurgitations of stomach content in 1 (2%) case (P=1.00), delayed recovery in 8 (16%) cases (P=0.009), ventilator required in 1 (2%) case (P=1.00). While in group of elective caesarean section all these anesthesia related complications were not found in any case (Table 3).

In group of emergency caesarean section, damage to surrounding viscera (tears in cervix and uterus) were found in 08 (28%) cases among intra-operative obstetric complications. In elective caesarean section cases no damage to viscera found (P=0.009). In cases of emergency caesarean section hemorrhage >1000 cc noted in 29 (58%) patients, while in group of elective caesarean section in only 2 (4%) cases hemorrhage >1000 cc noted (P=0.000). The rest of complications are shown in (Table 4).

Among postoperative complications of caesarean section, anemia found in majority 35 (70%) cases of emergency caesarean section group, while in elective caesarean section group anemia found in only 20 (40%) cases (P=0.004). In

Table 2: Booking status of the patients of two groups (n=100)

Status	Emergency cesarean section (n=50)		Elective cesarean section (n=50)		p-value
	Number	%age	Number	%age	
Booked	-	-	11	22%	
Un-booked	50	100%	39	78%	0.001
Total	50	100%	50	100%	

Table 3: Intraoperative complications of anesthesia in two groups (n=100)

Complications	Emergency cesarean section (n=50)		Elective cesarean section (n=50)		p-value
	Number	%age	Number	%age	
Difficult intubation	1	2%	-	-	1.00
Regurgitation of stomach contents	1	2%	-	-	1.00
Ventilator required	1	2%	-	-	1.00
Delayed recovery	8	16%	-	-	0.009

Table 4: Intraoperative complications in two groups (n=100)

Complications	Emergency caesarean section (n=50)		Elective caesarean section (n=50)		p-value
	Number	%age	Number	%age	
Damage to surrounding viscera (tears in cervix and uterus)	08	16%	-	-	0.009
Hemorrhage >1000 cc	29	58%	02	04%	0.000
Bladder injury	09	18%	-	-	0.005
Uterine atony	07	14%	02	04%	0.16
Upper segment caesarean section	01	02%	-	-	1.00

emergency caesarean section group postpartum hemorrhage (PPH) found in 14 (28%) cases. others are tabulated fever found in 4 (8%) cases (P=0.01). In emergency caesarean section group abdominal distension recorded in 15 (30%) cases, while in elective caesarean section group abdominal distension found in 4 (8%) cases (P=0.01). In emergency caesarean section group wound sepsis recorded in 4 (8%) cases, while in elective caesarean section group no case found (P=0.12). In emergency caesarean section group upper respiratory tract infection noted in 9 (18%) cases, while in elective caesarean section group upper respiratory tract infection (URTI) recorded in 1 (2%) case (P=0.01). In emergency caesarean section group urinary tract infection (UTI) found in 12 (24%) cases, while in elective caesarean section group urinary tract infection (UTI) found in 4 (8%) cases (P=0.05). In emergency caesarean section group blood transfusion done in 32 (64%) cases, while in elective caesarean section group blood transfusion done in 4 (8%) cases (P=0.000) {Table 5}.

Anemia found in majority of cases among patients in emergency caesarean section group. On investigations their hemoglobin level ranged from 4.00 mg/dl to 11.70 mg/dl with mean hemoglobin of 9.492 + 1.92 mg/dl. Among patients of elective caesarean section group, anemia was found in 20

Table 5: Postoperative complications in two groups (n=100)

Complications	Emergency caesarean section (n=50)		Elective caesarean section (n=50)		p-value
	Number	%age	Number	%age	
Postpartum hemorrhage	14	24%	03	06%	0.007
Fever	15	30%	04	08%	0.01
Abdominal distension	15	30%	04	08%	0.01
Wound sepsis	04	08%	02	04%	0.12
Upper respiratory tract infection	09	18%	01	02%	0.01
Anemia	35	70%	20	40%	0.004
Urinary tract infection	12	24%	04	08%	0.05
Blood transfusion	2	64%	04	08%	0.000
Headache	03	06%	06	12%	0.48
Renal failure	01	02%	-	-	1.00
Blood trans-fusion reaction	03	06%	-	-	0.24
Endometritis	02	04%	-	-	-
Prolonged Catheter	09	18%	-	-	0.005
Throat irritation	07	14%	02	04%	0.16

Table 6: Follow up complications in two groups (n=100)

Complications	Emergency caesarean section (n=50)		Elective caesarean section (n=50)		p-value
	Number	%age	Number	%age	
Anemia	16	32%	07	14%	0.05
Urinary tract infection	09	18%	02	04%	0.05
Wound sepsis	02	04%	04	08%	0.47
Vaginal candidiasis	02	04%	-	-	0.47
Gapped episiotomy	01	02%	-	-	1.00
Deep Vein Thrombosis	01	02%	-	-	1.00
Jaundice	01	02%	-	-	1.00
Headache	-	-	01	02%	1.00

cases, much less than the emergency caesarean section group. Their hemoglobin level (Hb %) found in the range of 7.00 to 13.00 mg/dl with mean of 10.916 + 1.5 mg/dl (P=0.000) {Table 6}.

Upon follow up after one month Anemia found in majority 16 (32%) patients in emergency caesarean section group, whereas in elective caesarean section anemia was found in 7 (14%) patients (P=0.05). In emergency caesarean section group wound sepsis observed in 2 (4%) cases, where as no case found in elective caesarean section (P=0.47).

DISCUSSION

In this study we had compared the maternal morbidity in emergency caesarean section and elective caesarean section. The reported benefits of planned (elective) caesarean section include greater safety for the baby, less pelvic floor trauma for the mother, avoidance of labor pain and convenience. The potential disadvantages, from observational studies, include increased risk of major morbidity or mortality for the mother, adverse psychological sequelae, and problems in subsequent pregnancies, including uterine scar rupture and greater risk of stillbirth and neonatal morbidity[9].

Regional and general anesthesia (GA) is commonly used for caesarean section (caesarean section) and both have advantages and disadvantages[10]. The Royal College of Anesthetists has set the standard that 85% of emergency caesarean sections should be carried out under regional anesthesia. Reducing the frequency of caesarean sections carried out under general anesthesia may serve to reduce maternal morbidity and mortality, which has been shown over recent years. The results showed that proportion carried out under regional anesthesia was less than recommended. Despite a longer time taken to induce anesthesia there was no increase in adverse fetal outcome, supporting the use of regional anesthesia wherever possible to keep maternal complications to a minimum[11]. Spinal anesthesia is the method of choice for caesarean section. There is however a significant associated morbidity and mortality in South Africa, particularly in inexperienced hands. Intraoperative anesthesia related complications in this study were seen in all cases operated under general anesthesia in emergency caesarean section group. These include difficult intubation, regurgitation of stomach contents, delayed recovery, ventilator requirement. In emergency caesarean section group general anesthesia was inducted in majority of cases in this series, while in other group general anesthesia was inducted in only 30% cases. In this group of elective caesarean section spinal anesthesia was inducted in majority of cases due to the reason that it has less associated morbidity and mortality than general anesthesia. Epidural anesthesia was also inducted in few patients of elective caesarean section with no complications. Very few postoperative complications have been reported in our study in elective caesarean section group as compared to emergency caesarean section group. This may be due to induction of spinal anesthesia in majority of cases of elective group which has less postoperative complications rate. Elective cases were properly managed for any comorbid diseases before the caesarean section. These findings are well correspond with the findings of Saadia Z et al[12].

The different postoperative complications encountered in this study were postpartum hemorrhage (PPH), fever, abdominal distension, wound sepsis, upper respiratory tract infection, anemia, urinary tract infection, blood transfusion, headache, renal failure, blood transfusion reaction, endometritis, prolonged catheterization, throat irritation, and mortality in only one case due to low grade anemia and anesthesia complications, in emergency caesarean section group. In many local and international studies all these postoperative complication have been reported with less or more frequency and majority of these occurred in emergency caesarean section[12-14].

In our study population we noticed more maternal complications in emergency caesarean section group than in elective caesarean section. The commonest complication was hemorrhage > 1000 cc in majority of emergency caesarean section cases, which occurred due to uterine atony and abnormal adherence of placenta. Morbidity and mortality associated with placenta previa and placental adhesions can be curtailed by routine screening of scarred obstetrical population, placental localization and elective caesarean section by expert person capable of handling the complications[12].

It is known that unnecessary caesarean section do more harm than good. When all is normal with the mother, caesarean section has an 8-fold higher mortality, 8-12 times' higher morbidity and a higher incidence of complications than vaginal delivery[15]. Higher incidence of emergency caesarean section is a major contribution for increased rate of maternal and fetal morbidity and mortality in caesarean deliveries[14]. In emergency caesarean section maternal mortality and morbidity is high [16].

The reported incidence of bladder injury at the time of caesarean section ranges from 0.14–0.56% and an overall incidence of 0.28%. Most injuries occur in the dome of the bladder and rarely involve the trigone. Bladder injuries occur as a result of a number of factors, including surgical difficulty encountered while developing the bladder flap over the lower uterine segment. The difficulty is usually caused by scar tissue from previous surgery[17]. Bladder injury was the second common intraoperative complication in our study in emergency caesarean section group. Other intraoperative complications include damage to viscera (tears of cervix and uterus), and uterine atony also occurred in emergency caesarean section group. Incidence of all these complications was high in this study as compared to other studies

reported incidence[12,14]. Extension into the broad ligament is the commonest reason for hemorrhage at caesarean section. Hemorrhage due to extension of incision requiring blood transfusion occurred in 24% of patients in one group as compared to another group in one study[18]. A fairly large proportion of women who underwent emergency caesarean section had longer hospital stay as compared to elective caesarean section group. This difference was statistically significant between the emergency and elective caesarean section groups. In a local study conducted by Roohi M et al[19], they also reported that duration of hospital stay was 7-10 days which is not more than the stay during caesarean section.

In this study we followed up these patients for one month and majority of patients in emergency caesarean section group came for follow up for their postoperative complications like anemia, urinary tract infection, wound sepsis, vaginal candidiasis, gapped episiotomy, deep vein thrombosis and jaundice. In other patients in elective caesarean section group very few complications were noted after one month follow up. These include anemia, urinary tract infection, and headache. Other complications were not reported in this group. This difference was significant between the two groups of emergency and elective caesarean section regarding complications after one months follow up.

CONCLUSION

It was concluded from the results of this study that maternal morbidity including intra-operative, post-operative and general anesthesia complications are higher in emergency caesarean section as compared to elective caesarean section.

REFERENCES

1. Dodd JM, Reid K. Tocolysis for assisting delivery at caesarean section. Cochrane Database Syst Rev 2006;4:CD004944.
2. Finger A. Caesarean section rates skyrocket in Brazil. Many women are opting for caesareans in the belief that it is a practical solution. Lancet 2003;362:628.
3. Katz VL, Cefalo RC. History and evolution of caesarean delivery. In: Phelan JP, Clark SL, editors. Caesarean delivery. New York: Elsevier Science; 1988. p. 1-18.
4. Khawaja NP, Yousaf T, Tayyeb R. Analysis of caesarean delivery at a tertiary hospital in Pakistan. J Obstet Gynaecol 2004; 24:139-41.
5. Belizan JM, Althabe F, Cafferata ML Health consequences of the increasing caesarean section rates. Epidemiology 2007;18:485-6.
6. Rubi N. Maternal complications associated with caesarean section: one year retrospective study. J Postgrad Med Inst 2000;14:83-9.
7. Sadia Z, Khan AZ, Naheed F. Comparison of maternal morbidity and mortality between emergency and elective lower segment caesarean sections. Ann King Edward Med Uni 2003;9:90-1.
8. Arulkumaran S. Malpresentation, malposition, cephalopelvic disproportion and obstetric procedures: caesarean section. In: Edmonds K, editor. Dewhurst's textbook of obstetric caesarean section and gynecology. 7th ed. Oxford: Blackwell Publishing / Oxford University Press; 2007. p. 213-26.
9. Lavender T, Hofmeyr GJ, Neilson JP, Kingdon C, Gyte GM. Caesarean section for non-medical reasons at term. Cochrane Database Syst Rev 2006;3:CD004660.
10. National Collaborating Center for Woman's and Children's Health, Moody J. Anesthesia for caesarean section. In: Moody J, editor. Caesarean section. London: The Royal College of Obstetricians and Gynecologists; 2004. p. 58-61.
11. Bowring J, Fraser N, Vause S, Heazell AE. Is regional anaesthesia better than general anaesthesia for caesarean section? J Obstet Gynaecol 2006;26:433-4.
12. Saadia Z, Khan AZ, Naheed F. Comparison of maternal morbidity and mortality between emergency and elective lower segment caesarean section. Ann King Edward Med Uni 2003;9:90-1.
13. Ali M, Ahmad M, Hafeez R. Maternal and fetal outcome; comparison between emergency caesarean section versus elective caesarean section. Professional Med J 2005;12:32-9.
14. Sikandar R, Memon A. Maternal & perinatal outcome following emergency caesarean section. Med Channel 2005;11:68-70.
15. Begum I, Khan A, Nasreen, Khan S. Outcome of previous caesarean section. Pakistan J Med Res 2004;43:130-3.
16. Ashraf R, Gul A, Bashir A, Tajammal A. Comparison of maternal complication in elective vs. emergency caesarean section. Ann King Edward Med Uni 2006;12:288-90.
17. Phipps MG, Watabe B, Clemons JL, Weitzen S, Myers DL. Risk factors for bladder injury during caesarean section. Am J Obstet Gynecol 2005:105:156-60.
18. Khosla AH, Dahiya K, Sangwan K. Caesarean

section in a wedged head. Indian J Med Sci 2003;57:187-91.

19. Roohi M, Farhat R. Myomectomy done during caesarean section. Professional Med J 2006; 13:299-302.

CONTRIBUTORS

MR conceived the idea and planned the study. SY & RK did the data collection & analyzed the study. SJ & NU supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.