Original Article: Obstetrics

Study of Maternal Mortality and Morbidity in Patients Undergoing Elective and Emergency LSCS

Haunemkim Suantak[1], Chandana Ray Das[2], Pranoy Nath[3]

ABSTRACT

Background: Caesarean section or caesarean delivery is a surgical procedure in which a baby is delivered through abdominal and uterine incision. A Caesarean delivery can be planned ahead of time or performed in an emergency. It carries more risk than a vaginal delivery. Caesarean delivery is mainly done in to save foetus and at times to save the mother by termination of pregnancy. It is sometimes associated with great deal of mortality and morbidity due to either intra operative or postoperative complications. Emergency LSCS has more complications as compared to elective LSCS. Most of the patients undergoing Emergency LSCS are un booked as compared to Elective LSCS. Complications are present both in Emergency and Elective LSCS with emergency relatively more. Most of the un booked and referred patients undergo emergency LSCS which contributes to major complications

Aims and objectives: The aim was to determine the prevalence of Caesarean delivery in Silchar Medical College and to study the most common cause leading to mortality and morbidity in patients undergoing Elective and emergency LSCS.

Materials and Method: A hospital based prospective observational study was conducted in Silchar Medical College and Hospital from 1st June 2021 to 31st May 2022 after approval from ethical committee. A total of 300 patients attending the Labour room were examined during the study period.

Results: During our study period total number of births were 9831, out of which 4375 birth were by Caesarean delivery. It was found that un-booked cases contributed more in emergency LSCS. Since $P < 0.001$, the un-booked patients are significantly associated with emergency LSCS. The maximum number of the patients had their education up to matriculation and maximum number of the patients were socioeconomically middle class. Highest number of cases belonged to age group 21 to 25years both in emergency LSCS and elective LSCS. Highest number of C-section is perform for primigravida and incidence of C section is decreasing with increasing parity. In our study patients undergoing emergency LSCS were mostly given midline

1. Junior Resident, Department of Obstetrics and Gynaecology , Silchar Medical College
2. Associate Professor, Department of Obstetrics and Gynaecology, Silchar Medical College
3. Professor and HOD, Department of Obstetrics and Gynaecology, Silchar Medical College
Corresponding Author: Haunemkim Suantak

vertical incision and transverse incision was common in elective LSCS patients. Out of the total of 200 patients who had emergency LSCS 30 of the patients were admitted in central ICU who were maternal near miss and out of 100 patients with elective LSCS only two patients were maternal near miss. fetal distress is the most common indication in emergency LSCS and previous Caesarean with associated complication is most common indication for Elective LSCS. Intra operative complications are higher with patients undergoing emergency LSCS. Patients undergoing emergency LSCS had more complications in postoperative period as compared to Elective LSCS. Anaemia was the most common maternal risk factor in the group of people undergoing Emergency LSCS and Gestational diabetes mellitus was common among in Elective LSCS group. There was a death of one patient out of 300 patients. She was a referred case of obstructed labour with severe anaemia. LSCS done with one blood in hand. She expired within 24hrs. in ICU

Conclusion: From our study we have found that anaemia and late referral is one of the leading causes in maternal mortality and morbidity

Key words: LSCS- lower segment caesarean section. ICU-Intensive care unit BOH-Bad obstetric history

Introduction:

Caesarean delivery is defined as birth of fetus through abdominal wall incision and uterine wall incision.[1]

Primary caesarean delivery defined as a caesarean delivery in a woman without a prior caesarean birth and secondary caesarean define as caesarean delivery in a woman who had a caesarean birth in previous pregnancy.[2]

Caesarean delivery was done to save fetus in the dead or dying mother in the 18th century. Caesarean delivery being done to save life of mother in Nineteenth century. Caesarean delivery has become an increasingly safe and common procedure with use of safe anaesthesia, suturing techniques, antiseptics, asepsis, blood transfusion and antibiotics. The continued improvement in safety has led to caesarean delivery being done on demand today with no medical indications though the mortality related to caesarean birth is still 3-4 times higher than vaginal birth.[3,4]

Caesarean section is one of the most performed surgical procedures in today's obstetric practice, and is associated with a great deal of maternal morbidity and mortality. With the immense advances in anaesthetic services and improved surgical techniques the morbidity and mortality of the procedure has decreased considerably.[5] After caesarean birth, the maternal mortality and morbidity is nearly five times increases than vaginal births, especially the risks of haemorrhage, sepsis, amniotic fluid embolism and thrombo embolism. In a subsequent pregnancy, caesarean section increases technical difficulties due to adhesions which leads to increase the risk of injury to bowel and bladder and more chance of morbid adhesion of placenta which may further result in higher risk of haemorrhage and Peripartum hysterectomy.[6]

The nature of the caesarean section performed is either elective or emergency depending on the indication of the caesarean section.

Elective caesarean section is a term used when the procedure is done at a pre-arranged time during pregnancy to ensure the best quality of obstetrics, anaesthesia, neonatal resuscitation, and nursing services. These are cases where there is an indication for caesarean section but there is no urgency and examples include placenta previa with no active bleeding and mal-presentation etc. The procedure is termed as emergency caesarean section when it is performed due to unforeseen or acute obstetric emergencies.[4] The emergency caesarean sections are carried out when there is an immediate threat to the mother or fetus.[7]

Materials and Method:

This is a prospective observational study among 300 pregnant women with entitled "Study of mortality and morbidity in patients undergoing elective and emergency LSCS" has been carried out in the

department of Obstetrics and Gynaecology of Silchar Medical College and Hospital, Silchar, Assam, in the period from 1st June to 31st May. Out of 300 cases 200 were emergency LSCS and 100 elective LSCS. The patients were selected in simple random method.

In a prepared proforma patients were examined for their name, age, parity, and general and obstetrics examination. The socioeconomic status, educational status, booking status, etc. too were noted. Their intra-operative and postoperative complications were noted. Complications leading to death of the patients were also noted. All investigation reports necessary were taken into account. Informed and written consent were obtained from all cases and attendants.

HISTORY OF PRESENT AND PAST CAESAREAN SECTION: The points to be noted are duration of pregnancy and labor, indication of the caesarean section. Whether it was maternal or fetal indication.

DETAILS OF OPERATION: A note is made in cases undergoing caesarean section regarding date, type of anaesthesia, indication of operation, blood transfusion or any complications. Any added procedures, intra operative findings, complications were also noted.

EXAMINATION OF PATIENT

Postoperative day 1 = BP, pulse rate, respiratory system, CVS, urine output, vaginal examination, abdominal examination, calculation of output and input (IV fluid) were done.

Postoperative day 2 = BP, pulse rate, respiratory system, CVS, urine output, catheter removed or not, whether minimal mobilization of patient done or not, Bowel sound if present or absent, oral liquid diet started or not were noted.

Post operative day 3 = BP, pulse rate, respiratory system, CVS, urine output, soft oral diet started or not were noted.

Post operative day 4 = bandage removal and examination of stitch site were done. Checked whether any discharge or gaping is there or not, whether patient passed urine or not. If patient does not have any other problem can be discharged.

Post- operative day 5=whether patient was discharged on day 5, if not then the reason for extended hospital stay were noted.

DISCHARGE

The observations recorded at the time of discharge were

1) for mother - pulse, blood pressure, temperature, condition of scar, HB and other parameters.
2) for baby - general condition, feeding, weight was noted.

METHODS

1) A series of 200 cases, irrespective of their age, parity, religion requiring emergency lower segment Caesarean section were taken up. Referral status, indications of Caesarean section were studied.
2) 100 patients who were planned beforehand for elective caesarean section were selected.
3) Booked case. These are the cases who had at least three antenatal checkup in her antenatal period and who have been admitted on their expected date of delivery.
4) Unbooked case. Those who doesn't had any antenatal checkup all throughout her pregnancy or had less than two antenatal checkup and those who were referred from other facilities as emergency.
5) Prevalence of lower segment caesarean section is found from the number of caesarean sections during the period of study.
6) Age: Five categories of age group were made for observation and description 15- 20 years, 21-25 years, 26-30 years, 31-35 years and above 35 years.
7) Parity ;The cases were divided into following groups according to parity into 0,1,2,3,4 and 5.
8) Indications for cesarean section were noted in each case. Maternal mortality and morbidity in patients undergoing emergency and elective LSCS It was found out from evaluation of certain factors during the period of study

-- Referral status, whether the patient was a referred case or booked case, the condition of patient at the time of referral
-- Any medical intervention taken after diagnosis in antenatal period
-- Indications of caesarean section Intra operative complications if any
-- Any added procedures postoperative complications

STATISTICAL ANALYSIS: Tables, PIE chart and BAR diagram used to show descriptive statistics. Chi square test was used to evaluate association between categorical variables. A p value <0.05 was considered as statistically significant at 95% confidence interval.

ETHICAL CONCERN: The study protocol was submitted to institutional research committee and ethical committee obtained approval. a written informed consent was obtained from participants of the study. All patients enrolled in this study received standard care. Clearance from ethical committee was received on 30th December 2020

RESULTS

Table1: Showing booking status of the patients in the study sample

	Emergency LSCS	%	Elective LSCS	%	P value
Un-booked	150	75%	2	2%	P<0.001
Booked	50	25%	98	98%	

Emergency LSCS comprised mainly of unbooked patients around 75%.and Elective LSCS comprised mainly of booked cases in our study

Table2: Baseline characteristics of the patient undergoing emergency and elective LSCS

Educational status	Illiterate	60	20.0%
	Primary	40	13.3%
	Secondary	30	10.0%
	Matriculate	90	30.0%
	Graduate	80	26.7%
Socioeconomic Status	Upper	80	26.7%
	Middle	100	40.0%
	Lower	120	33.3%

Table 3: Age distribution of patients undergoing caesarean sections both in emergency and elective cases

Age	Emergency LSCS	%	Elective LSCS	%	P value
15-20	50	25%	10	10%	0.0019
21-25	74	37.5%	50	50%	
26-30	50	25%	20	20%	
31-35	20	10%	10	10%	
35 above	6	3%	10	10%	
Total	200		100		

Majority of the patients undergoing both emergency and elective LSCS were in the age group 21 to 25yrs of age. Since P< 0.0019 it is statistically significant

Table 4: Distribution of cases in relation to parity

Parity	Emergency		Elective		P value
	Number	%	Number	%	
1	110	55%	50	50%	P < 0.0001
2	41	20.5%	45	45%	
3	25	12.5%	5	5%	
4	13	6.5%	0	0	
5	8	4%	0	0	
5 above	3	1.5%	0	0	

Hence it is evident from the above table that highest number of C- Section is performed among primigravida. Since p value is < 0.001.it is statistically significant

Table 5: Distribution of type of abdominal incisions among the patients

	Emergency LSCS		Elective LSCS		P value
Type of incision	number	%	number	%	
Transverse incision	40	20%	95	95%	P<0.0001
Vertical incision	160	80%	5	5%	
Total	200		100		

It is evident from the above table that vertical incision was mainly given in emergency LSCS and transverse incision was mainly given in Elective LSCS in our study

Table 6: Distribution of maternal near miss cases in patients undergoing emergency and Elective LSCS

Emergency LSCS		Elective LSCS	
Number	Percentage	Number	Percentage
30	15%	2	2%
Total=200		Total=100	

The number of patients requiring ICU admission following operation were included in maternal near miss. Here 15% of the patients who underwent emergency LSCS had the need for ICU care as compared to Elective LSCS

Table 7: Indication of Emergency LSCS and Elective LSCS

Indication	Emergency LSCS	%	Elective LSCS	%
Fetal distress in first stage of labour	50	25%		
Post CS with induction failure	15	7.50%		
Post CS with scar tenderness	7	3.50%		

Indication	Emergency LSCS	%	Elective LSCS	%
Post CS with draining PV	3	1.50%		
Post CS with fetal distress	3	1.50%		
Post CS with oligohydramnios	3	1.50%	6	6%
Post CS with twin gestation	2	1.00%	7	7%
Post CS postdated pregnancy not In labour			9	9%
Post CS with gestational diabetes mellitus			8	8%
Post CS with pregnancy induced hypertension	6	3%	6	6.0%
Post cs with no Living issue	3	1.50%	5	5%
Twice post caesarean	3	1.50%	6	6%
Thrice post caesarean	1	0.05%		
Oligohydramnios	18	9.00%	17	17%
Prolong labour	19	9.50%		
Obstructed labour	11	8.00%		
CPD	9	4.50%		
Transverse lie	4	2.00%		
IUGR	6	3.00%		
Antepartum haemorrhage	4	2.50%		
APE	14	7.00%	2	2%
Preeclampsia	6	3.00%		
Primi breech	10	5.00%	8	8%
Cord prolapse	3	1.50%		
BOH			16	16%
Elderly primi			10	10%
TOTAL	200	100.00%	100	100.00%

The most common indication in emergency LSCS was fetal distress followed by Post CS wt associated complications.the most common indication in Elective LSCS was Post CS wt associated complication.

Table 9: Caesarean section in relation to their intraoperative complications

	Emergency LSCS		Elective LSCS		P value
	Number	%	Number	%	
1. Scarrupture	5	2.5%	0		0.7250
2. Extension of Surgical Incision	7	3%	3	3%	
3. Intraoperative Anyadded Procedure	8	4%	2	2%	
3. Need for Blood Transfusion	10	5%	3	3%	
4. Convulsion	4	2%	0		
5. Respiratory Complications	1	0.5%	0		
6. Need for Ionotropes	3	1.5%	0		
7. Cardiacarrest	1	0.5%	0		
Total	39	20.5%	8	8%	

Among our study groups of 200 patients undergoing emergency LSCS. 39 (20.5%) patients had intraoperative complications the most common intraoperative complication in emergency LSCS was need for blood transfusion 10 (5%). Out of the total 100 patients who underwent Elective LSCS, 8 (8%) patients had complications, the most common complication was extension of surgical incision 3%.

Table10: Postoperative complications associated with Caesarean section

Complications	Emergency LSCS	Elective LSCS	P value
1. Anaemia	14	1	0.6237
2. Postpartum haemorrhage	9	1	
3. UTI with urinary retention	5	2	
4. Wound infection	7	0	
5. Abdominal dist	4	1	
6. Respiratory distress	4	0	
7. Prolongedhospital stay	7	1	
Total	50	6	

Among the study group of 200 patients undergoing emergency LSCS 50 patients had postoperative complications and anaemia being the most common post operative complication. In elective LSCS only 6 patients out of 100 patients had post operative complication

Table 11: Showing distribution of subjects based on maternal risk factors

Riskfactors	Emergency LSCS (n=200)	Elective LSCS (n=100)	P value
Anaemia	30	6	0.0002
Antepartum ecclampsia	14	4	
Preeclampsia	6	2	
Gestational diabetes mellitus	1	7	
Heart disease	4	1	
Epilepsy	1	0	
Asthma	2	7	
Total	58	27	

The most common maternal risk factor in Emergency LSCS was anaemia.

Table 12: Showing number and cause of maternal death in study population.

	Emergency LSCS	Elective LSCS
No of death	1	nil
Cause of death	P4L3 at day 2 post op with severe anemia with anemic heat failure	nil
Total no of Caesarean delivery	200	100

Discussion

PREVALENCE OF CAESAREAN DELIVERY: During the study period, the prevalence of caesarean section is found to be around 44%in our hospital.

It is much higher than the WHO advocated ideal rate of (10 to 15%). Prevalence of caesarean section was 21.40% as per study by Hafeez et al[9] in 2014. The prevalence of cesarean delivery was 63% according to a study by R. Choudhury et al[11] in 2018.

BOOKING AND UNBOOKED STATUS: The unbooked or referred cases were more in Emergency LSCS as compared to Elective LSCS. 75% were unbooked cases in emergency LSCS.

Table 1: Showing booking status of patients undergoing caesarean section

Studies	Booked		Unbooked	
	EM	EL	EM	EL
Rabbiq et al[9] (2015)	36%	60%	63%	40%
P. Renuka et al[12] (2016)	76.70%	92.70%	23%	7.3%
N.Hemlatha et al[10] (2021)	68%	92.9%	32%	7.1%
Present study	25%	98%	75%	2%

SOCIOECONOMIC AND EDUCATIONAL STATUS

In our study we have found that maximum of our patient in the study were matriculate 30 % and as per Kuppuswamy socioeconomic status scale, 40% belonged to middle class. In a study by Gayathry et al,[13] most of the patients undergoing caesarean section was belonging to lower middle class family.

MATERNAL NEAR MISS CASES

In our study we have found patients requiring ICU care following cesarean delivery was more in emergency LSCS (15%) whereas around 2% in elective case.

According to Mina Harde et al[14] 2014total admission in ICU following LSCS was 2.8 %in a study of 2 years duration. As compared to other cases, obstetrics cases following emergency LSCS had high occupation rate 67%. Among the other obstetrical indication for ICU admission haemorrhage was found to be very significant cause.

INTRAOPERATIVE COMPLICATIONS

Table 2: Showing incidence of intraoperative complications due to emergency and elective cesarean section

Studies	Emergency LSCS	Elective LSCS
Ghazi et al[15] 2012	96%	30%
Gayathry et al[13s] 2017	45.3%	22.2%
Dr. B.S. Patel et al[16] 2020	24.6%	8.6%
Present study	20.5%	8%

Hence we can conclude from above studies that emergency LSCS has more intra operative complications when compared to Elective LSCS. According to N Hemlatha[10] 2021, scar rupture and need for blood transfusion was less in elective LSCS when compared to Emergency LSCS. In our study also we found that, scar rupture was less among patients undergoing Elective LSCS. In our study maximum complications intraoperatively was need for blood transfusion in both emergency and elective LSCS. The need for blood transfusion was also more comparatively in emergency LSCS as per study of N. Hemlatha.[10]

POSTOPERATIVE COMPLICATION

Table 3: Showing Post operative complications associated with cesarean section.

Studies	Anaemia		PPH		Woundinfection	
	EM	EL	EM	EL	EM	EL
Gayathry D et al[13] 2017	10.7%	6.7%	5.3%	2.2%	2.7%	1.1%
V. Thakur et al[17] 2015			0.91%	0.57%	26.62%	12.78%
Rabbiahaq et al[8] 2012	43.3%	16.6%			10%	3.3%
N. Hemlatham D[10] 2021	80%	19.57%			15%	nil
Present study	7%	1%	4.5%	1%	3.5%	nil

Anaemia as a post operative complication was seen more in Emergency LSCS than in Elective CS as per study by Gayathry et al and N. Hemlata. PPH was also commonly seen in emergency LSCS more than in

Elective CS. Wound infection was more common in Emergency LSCS case as per the above studies.

One maternal death was seen in a case of G4P3L2 at term pregnancy with obstructed labour with severe anaemia. She was a referred case and she doesn't have any antenatal check up. She was operated with 2 units of blood in hand. She died in CICU within 24 hours after surgery because of anemic heart failure From our study we have found that anaemia and late referral is one of the leading causes in maternal mortality and morbidity.

Conclusion

Majority of patients who underwent caesarean section were un-booked. Morbidity was high among the un-booked cases who were referred with no previous investigations. In un-booked cases there is no previous analysis of the risk factors, no early diagnosis and intervention for the presenting risk factors. Hence the main underlying cause of mortality and morbidity is due to no proper intervention earlier as there is no proper antenatal check up being done. With proper counseling and checkup, the patient's morbidity and mortality can be reduced to a very much higher extent.

From our study we have found that anaemia and late referral is one of the leading causes in maternal mortality and morbidity.

Measures recommended to decrease the common causes of mortality and morbidity due to elective and emergency LSCS

- Proper antenatal check up and regular blood investigation
- Timely diagnosis and intervention of any high-risk cases
- Proper counseling of the patient and her household members. Proper training of peripheral health workers

REFERENCE

1. Cunningham FG, Leveno KJ, Bloom SL et al wenstorm KD, editors. Williams Obstetrics.22nd ed. Newyork: McGraw-Hill Companies; 2005.available on download. bioon.com
2. GABBE'S OBSTETRICS Normal and Problem Pregnancies, 8th Edition, Page-375-376
3. Deneux-Tharaux C, Carmona E, Marie-Hélene BC, Gérard B. Postpartum maternal mortality and cesarean delivery. Obstetrics & Gynecology. 2006;108(3):541-48.
4. Callaghan WM. Overview of maternal mortality in the United States. Semin Perinatol. 2012;36(1):02-06
5. Gurunule AA, Warke HS. Maternal and foetal outcome in elective versus emergency caesarean sections. Int J Reprod Contracept Obstet Gynecol. 2017 Apr 1;6(4):1222-8.
6. Gupta M, Saini V. Caesarean section: mortality and morbidity. risk. 2018; 2:53.
7. Toffel S, Placek P, Kosary CVS. Cesarean sections rates 1990: an update. Birth. 1992; 19:21-2
8. RABBIA HAQ AY, BANO B, REHMAN R. Post-operative Maternal Complications. A Comparison Between Elective and Emergency Caesarean Sections. Journal of Fatima Jinnah Medical University. 2012;6(2).
9. Hafeez M, Yasin A, Badar N, Pasha MI, Akram N, Gulzar B. Prevalence,and indications of caesarean section in a teaching hospital. JIMSA. 2014 Jan;27(1):15-6.
10. Hemalatha N. A study of maternal morbidity and mortality in elective and emergency lower segment caesarean section. 2021.
11. Chaudhary R, Raut KB, Pradhan K. Prevalence, and indications of cesarean section in a community hospital of western region of Nepal. JNMA; Journal of the Nepal Medical Association. 2018 Sep 1;56(213):871-4.
12. Renuka PA, Suguna V. Comparative study of maternal and foetal outcomes in patients undergoing elective or emergency Caesarean section. J Med Sci Clin Res. 2016 Dec 28;4(12):15059-69.
13. Gayathry D, Guthi VR, Bele S, Vivekannada A. A study of maternal morbidity associated with caesarean delivery in tertiary care hospital. Int J Community Med Public Health. 2017 Apr 24; 4:1542-7.
14. Harde M, Dave S, Wagh S, Gujjar P, Bhadade R, Bapat A. Prospective evaluation of maternal morbidity and mortality in post-cesarean section patients admitted to postanesthesia intensive care unit. Journal of anaesthesiology, clinical pharmacology. 2014 Oct;30(4):508.
15. Ghazi A, Karim F, Hussain AM, Ali T, Jabbar S. Maternal morbidity in emergency versus elective caesarean section at tertiary care hospital. Journal of Ayub Medical College Abbottabad. 2012 Mar 1;24(1):10-3.
16. Patel BS, Patel AB, Patel AJ, Banker DA, Patel MB. Maternal and neonatal outcome in elective versus emergency cesarean section in a tertiary healthcare Centre in Ahmedabad, Western India. British Journal of Medical & Health Sciences (BJMHS). 2020 May;2(5):231-40
17. Thakur V, Chiheriya H, Thakur A, Mourya S. Study of maternal and fetal outcome in elective and emergency caesarean section. Emergency. 2015 Dec 31; 2521:78-37.