International Journal of Medical and Pharmaceutical Research
Website: https://ijmpr.in/ | Print ISSN: 2958-3675 | Online ISSN: 2958-3683
NLM ID: 9918523075206676
Volume: 4 Issue:2 (Mar-Apr 2023); Page No: 625-632

Research Article

Comparative Study of Maternal and Neonatal Outcomes in Second Stage LSCS Vs First Stage LSCS in Tertiary Care Centre

Dr Dhanashri Ankush Patil[1], Dr Varsha Deshmukh[1], Dr Shrinivas Gadappa[1], Dr.Aishwarya Chandwade[1]

[1]Department Of Obstetrics And Gynaecology, Govt. Medical College And Hospital, Aurangabad, Maharashtra, PIN: 431001, INDIA

ABSTRACT

Introduction: Caesarean section is probably the most common surgical procedure carried out in obstetrics. The rates of caesarean sections have risen steadily in the past few decades. Caesarean section in the second stage of labour is a more challenging surgical procedure and has adverse feto-maternal outcomes than performed in the first stage or before labour. The present study was done at our tertiary care centre to compare complications of Caesarean Section in the First Stage and Second Stage of Labour and the strategy to reduce maternal and neonatal complications. **Objective**: To study the indications of first stage of LSCS and second stage of LSCS and to study Maternal and neonatal outcome in first stage and second stage of LSCS. **Methods**: Prospective observational study in tertiary institute from November 2020 to October2022 in department of OBGY, GMCH, Aurangabad, Maharashtra. Institutional Ethical committee approval was taken. 200 women willing to participate in the study are chosen as per the inclusion and exclusion criteria. Among these 100 women of first stage LSCS and 100 women of second stage LSCS. **Results**: In present study, most of women were unbooked (62.5%) and from rural area (58%),belongs to 21-25 years age group (55.5%) and 53% had normal BMI range (>18-25) with 54% had socio-economic class IV. As compare to first stage, Second stage LSCS had more intraoperative and postoperative maternal complications like excessive blood loss (P value 0.035)., uterine artery ligation (P value<0.001), extension of uterine incision (P value 0.009), blood transfusion requirement (P value 0.017), more operative time(P value0.006), prolonged hospital stay(Pvalue0.004).In Neonatal outcomes, NICU admission were more in second stage LSCS than first stage LSCS. **Conclusion**: Second stage LSCS has significant neonatal morbidities as well as maternal morbidities. The rate of complications of second stage LSCS can be minimized by use of partograph in labour, consistent monitoring of labour and timely intervention and it should be handled and operated by experienced obstetricians.

Key Words: *second stage LSCS, maternal morbidity and neonatal complications.*

***Corresponding Author**
Dr Dhanashri A Patil
Department Of Obstetrics And Gynaecology, Govt. Medical College And Hospital, Aurangabad, Maharashtra, PIN: 431001, INDIA

INTRODUCTION

Caesarean section is probably the most common surgical procedure carried out in obstetrics [1]. It is defined as the birth of a foetus through abdominal and uterine incisions after the period of viability. However, caesarean delivery indications have changed over the last few years as it has become safer due to improved anaesthesia techniques, the advent of powerful and effective antibiotics, availability of blood transfusion facilities, and improvement in surgical techniques and operative skills and neonatal care. Furthermore, in these days of small families, the baby's right to survival is increasingly recognized. Consequently, most of the indications of caesarean section are now made for the interest of the baby. The overall caesarean section rates are increasing at an alarming rate in India. In a population-based cross-sectional study, the public, charitable and private sector hospitals had caesarean section rates of 20%,38% and 47%, respectively[2]. Decision-making surrounding caesarean section in the Second stage of labour is one of the most significant challenges in current obstetric practice. The rates of caesarean sections have risen steadily in the past two decades. They may be associated with a disproportionate rise in the Second stage of caesarean section due to a decline in the use of instrumental deliveries. Caesarean section in the second stage of labour is a more challenging surgical procedure and has adverse feto-maternal outcomes than performed in the first stage or before labour. Initiatives are being taken worldwide to reduce caesarean delivery rates, but it is also important to evaluate if these efforts are placing mothers and babies at risk[3]. The present study was done at our tertiary care centre to compare complications of Caesarean Section in the First Stage and Second Stage of Labour and the strategy to reduce maternal and neonatal complications.

Material and Methods:

The prospective observational study was done at the department of Obstetrics and Gynaecology, Government Medical College, Aurangabad, after due permission from the Institutional Ethics Committee to study the indications and

maternal and perinatal outcomes in the first stage and second stage of LSCS. (November 2020 to October 2022).200 Cases were selected using purposive sampling and placed in either Group.

Inclusion Criteria:
Group 1. Patient at 37wks to 41 weeks of gestation with a singleton pregnancy with cephalic presentation undergoing first stage LSCS.
Group 2. Patient at 37wks to 41 weeks of gestation with a singleton pregnancy with cephalic presentation undergoing second stage LSCS.

Exclusion Criteria:
1.Non cephalic presentation
2. Acute obstetric complications such as antepartum haemorrhage and antepartum eclampsia.
3. Maternal comorbidities or pregnancy-related problems like gestational hypertension and GDM.
4. Major foetal structural anomaly or pregnancy-related foetus complication.
5. Multiple gestation

Maternal age, BMI, gestational age, and augmentation of labour with oxytocin were recorded. Information regarding demographic data, relevant obstetric data, cervical dilatation at delivery, and indications for caesarean section, maternal and neonatal complications, Induction/Augmentation of Labour were recorded. The maternal duration of hospital stays, intraoperative and postoperative complications, operative time, and estimated blood loss were recorded. Birth weight, APGAR score of the newborn at the 5th minute, and neonatal intensive care unit admission data and complications were recorded. Prophylactic antibiotics were administered to all patients after clamping the umbilical cord. All the documents will be meticulously recorded, including the partograph and CTG. A lower segment approach technique was used (Pfannenstiel incision). Excessive blood loss was defined as > 1000 ml or a drop in haematocrit by 2% after 48 hours of LSCS.

Statistical analysis:
Data was entered into a Microsoft Excel data sheet and was analysed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. The chi-square test was used as a test of significance for qualitative data. P value (Probability that the result is true) of <0.05 was considered statistically significant after assuming all the rules of statistical tests.

Results:
In the present study, a total of 200 patients were enrolled. Out of this, 100patients of the first stage LSCS(Group1) and 100 of the second stage LSCS(Group2) were studied. The overall rate of caesarean deliveries is 24.4% in our hospital.

TABLE I: showing demographic features of first stage LSCS and second stage LSCS

Variables	Details	1st Stage of labor		2nd Stage of labor		Total	%	P value
		Grp 1 (N=100)	%	Grp2 (N=100)	%			
Age	18-20	26	26	22	22	48	24	0.786
	21-25	52	52	59	59	111	55.5	
	26-30	17	17	12	12	29	14.5	
	31-35	5	5	6	6	11	5.5	
	>35	0	0	1	1	1	0.5	
BMI	<=18	15	15	16	16	31	15.5	0.384

	>18-25	58	58	48	48	106	53	
	>25-30	24	24	29	29	53	26.5	
	>30	3	3	7	7	10	5	
socio economic status	**I**	3	3	1	1	4	2	
	II	18	18	16	16	34	17	
	III	52	52	56	56	108	54	0.852
	IV	19	19	18	18	37	18.5	
	V	8	8	9	9	17	8.5	
Booked/ unbooked	B	44	44	31	31	75	37.5	0.057
	UB	56	56	69	69	125	62.5	
Rural/ Urban	R	54	54	62	62	116	58	0.251
	U	46	46	38	38	84	42	

In both the groups, most of women belongs to 21-25 years age group (55.5%) and 53% women had normal BMI range (>18-25) with 54% had lower middle socio-economic class. Most of the women were unbooked (62.5%) and from rural area (58%).

TABLE II: showing obstetric status of first stage LSCS and second stage LSCS

Sr no.	**Gestational age (weeks)**	**1st Stage of labor**			**2nd Stage of labor**			**Total**	**P value**
		primi	multi	total	primi	multi	total		
1	**37-38**	9	6	15	9	3	12	27	0.53
2	**38.1-40**	39	27	66	37	19	56	122	0.15
3	**>40**	14	5	19	25	7	32	51	**0.035**
	Total	62	38	100	71	29	100	200	

Majority of the women (133) were primigravida in both the groups, 62% were in group1 and 71% were in group 2. Majority of the subjects 122 belonged to 38.1 TO 40 weeks of gestational age in both the groups. This was followed by women with >40wks of GA, 19% were in group1 and 32% were in group2 which was statistically significant(P value 0.035).

TABLE III: showing Indications of first stage LSCS and second stage LSCS

Sr no.	Details	First stage LSCS	%	second stage LSCS	%	TOTAL
1	Fetal distress	51	51	58	58	109
2	CPD	12	12	16	16	28
2	Second stage Arrest	0	0	18	18	18
4	Deep transverse arrest	0	0	2	2	2
5	Obstructed labor	0	0	6	6	6
6	Failure of inductions	14	14	0	0	14
7	Unfavourable cervix-severe oligo, Anhydramnios	23	23	0	0	23

Most common indication LSCS in both the groups were Foetal distress, total 109 patients underwent LSCS because of foetal distress in which 51% in group1 and 58 % in group2.

TABLE IV: showing Maternal complications of first stage LSCS and second stage LSCS

Sr no.	Details	1st Stage of labor		2nd Stage of labor		Total	P value
		Count	(%)	Count	(%)		
1	Excessive Blood loss (>1 liter)	11	11	23	23	34	**0.035**
2	Uterine Artery ligation	6	6	15	15	21	**<0.001**
3	Extension of incision	2	2	11	11	13	**0.009**
4	Injury to bladder	0	0	1	1	1	--

5	B Lynch suture taken	1	1	2	2	3	>0.99
6	Blood transfusion and blood products	12	12	25	25	37	**0.017**
7	Operative time(>45min)	32	32	51	51	83	**0.006**
8	Hysterectomy	0	0	1	1	1	--
9	PPH	6	6	8	8	14	0.579
10	Infection	2	2	4	4	6	0.407
11	prolonged foley's catheterization	5	5	9	9	14	0.172
12	hospital stay	20	20	33	33	53	**0.04**
13	Wound discharge	8	8	12	12	20	0.175

In present study, there was statistically significant difference maternal complication like excessive blood loss(34), uterine artery ligation(21), extension of incision(13) and need of blood and blood products transfusion(37)were more in group2 than group1. Mean operative time in group1 was 40.91 ±5.06min and mean operative time for group 2 was 49.41 ±8.97.min which was found to most common maternal complication. **There was statistically significant difference found between groups with respect to duration of Hospital stay.** (Pvalue0.04) **and Operation Time (P value 0.006).**

TABLE V: showing neonatal outcome of first stage LSCS and second stage LSCS

Weight (gm)	**1st Stage of labor**		**Total**	**2nd Stage of labor**		**Total**	**P value**
	APGAR <7	APGAR >7		APGAR<7	APGAR>7		
1501-2000	2	2	4	1	1	2	0.407
2001-2500	5	29	34	6	9	15	**0.0018**
2501-3000	6	42	48	9	48	57	0.203
>3001	2	12	14	4	22	26	**0.034**
Total	15	85	100	20	80	100	

In present study majority of the babies had birth weight within normal range, that is 2501gm-3000gm, 48% babies were in group1 and 57% babies were in group2(P value 0.203). **There was a statistically significant difference found between groups with respect to Baby Weight between 2001gm to 2500gm** (P value 0.0018) **and in between >3001gm baby weight** (P value 0.034).

TABLE VI: showing Neonatal complications of first stage LSCS and second stage LSCS

Sr no.	Details	1st Stage of labor		2nd Stage of labor		Total	P value
		Grp 1 (N=100)	%	Grp 2 (N=100)	%		
1	NICU admission and stay	8	8	17	17	25	**0.047**
2	meconium aspiration syndrome	4	4	7	7	11	0.352
3	Neonatal sepsis	2	2	4	4	6	0.407
4	Neonatal seizures	2	2	3	3	5	0.516
5	Death	2	2	4	4	6	0.407

In present study, total 25 babies required NICU facility that is 8% NICU admissions were in group 1 and 17% were in group 2 (Pvalue0.047). 2% Neonatal deaths were in group 1 and 4% were in group 2 (Pvalue0.407).

DISCUSSION:

The present study clearly demonstrated that women who underwent caesarean delivery in the second stage of labour had significantly higher maternal and neonatal morbidity. In addition, caesarean delivery performed in the second stage was associated with increased maternal morbidity, such as difficulty in head delivery, haemorrhage, and uterine angle extension. The results were statistically significant between cases and controls (P<0.05).

Table 1 And 2:The majority of cases and controls were in the age group of 21-25 years. There was no significant difference in age between cases and controls. (p value NS). In the present study, the mean BMI (kg/m3) in Group 1 was 23.04±3.92, and in Group2 was 23.76±4.07.The present study's maternal demographics and labour characteristics are comparable to the observations reported by Asıcioglu et al. [4]. Primigravida in Group 2 was71%, and multigravida was29%. In the study by Malathi and Sunita, 61% of women were in the age group of 21 to 30 years, and primigravida contributed to 74%. They concluded that the increased frequency of second stage caesareans in primigravida could be cephalopelvic disproportion, rigid perineum, and lack of previous labour experience.[5] In the present study, the mean gestation period in Group 1 was 39.17±1.03 weeks and 39.4±3.56 weeks in Group 2.In the study by Sinha et al., the mean period of gestation was 39.24±1.38 and 39.25±1.12 weeks in Group1 and Group 2,respectively[6]

Table 3: The most common indication for Caesarean section in Group 2 was foetal distress-(non-reassuring CTG)in 58% of cases, followed by Second stage arrest(CPD) in 36%.The most common indication for caesarean section in Group 1 was foetal distress (51%), followed by unfavourable cervix and oligohydramnios (23%).In the study by Anusha et al., dystocia was the most common indication for caesarean delivery in both groups, especially the second-stage Group (65.1%) vs, the first-stage Group (37.6%)[7].In our study, DTA and obstructed labour were also seen in the second stage LSCS.

Table 4: In our study, maternal morbidity was observed in PPH (23%) cases in Group 2 compared to 11 cases in Group 1. Of these,18 cases required surgical management, i.e. uterine artery ligation (15),B-Lynch sutures(2), and obstetrics hysterectomy (1). The rest of the 5 cases were managed medically. Other maternal complications were LUS

tear and angle extension (11%), wound morbidity (12%), prolonged catheterization (9%), and need for blood transfusion (25%). All the above morbidities were much more prevalent in second stage LSCS than the first stage LSCS. Our study findings agree with the conclusions of Deshpande et al. and Silver et al. [8,9]. In the study by Shahla B, PPH was present in 12.5%, wound infection in 8.33%, and angle extension in 5.41% of cases.[10] The caesarean section performed in the second stage of labour was technically tricky because the foetal head was engaged in the pelvis, uterine muscles were thin and tense, and identification of the bladder and the lower segment was difficult. Apart from these, relatively large baby weight contributed to the high complication rate in the second stage LSCS compared to the first stage LSCS. The mean hospital stay in Group 1 was 6.07 + 1.78 days, and Group2 was 7.17 + 2.45 days. A statistically significant difference was found between groups concerning the duration of hospital stay. (Pvalue<0.04) and operation time (P value <0.006). Operative time was also increased due to difficulty delivering the engaged head. Delivery of an engaged head is a challenge to the obstetrician. Similar findings were seen in the study done by Murphy D J et al. [11] It can be identified from one of the retrospective studies in Canada that the woman in second Stage LSCS was 2.6 times responsible for causing some intraoperative trauma.[12] Prolonged labour can lead to increased attenuation in the lower uterine part and the cervix. As a proxy in abnormal labour, oxytocin can be used, leading to dangerous situations.[13]. Sung et al. found that the elongated period of second-stage labour is usually correlated toextensions that are unintentional.[14] The non descent of the head having some significant caput and the formation of moulding make the foetal head delivery very challenging.[15].

Tables 5 And 6: The APGAR score-based distribution was statistically similar in both study groups (p>0.05). 17% of the babies in Group 2 and 38% in Group 1 were low birth weight. There was a statistically significant difference found between groups with respect to baby weight (p<0.05).This finding correlated well with the gestational age and birth weight.In group 2, the neonatal complications that required NICU admission (17%) were meconium aspiration (7%), neonatal sepsis (4%), seizures(3%), and neonatal death(4%)(p value<0.047)The infants which are born through the CS of second Stage have higher incidences of neonatal complications as compared to CS done in the first stage of labour. Various studies have stated the same in their conclusion. [16,17,18] Khaniya et al. reported that the commonest neonatal complication was related to the stained meconium amniotic fluid and intraoperative foetal hypoxia [19].

CONCLUSION: -

Second stage LSCS has significant neonatal morbidities like high NICU admission and stay as well as maternal morbidities like blood loss, the extension of uterine incision, required uterine artery ligation, a requirement of blood transfusion, and higher incidence of wound discharge than first stage LSCS. Therefore, utmost efforts should be made to avoid procrastination in the decision of LSCS in the second stage. Still, if such a compelling situation occurs, precautions like the presence of a senior person for vigilance and minimizing the complications should be undertaken. A Caesarean Section in the second stage of labour is a technically demanding procedure. It has additional associated risks for both the mother and foetus due to the nature of the emergency situation. Foetal distress was the most common indication in both the first Stage LSCS as well as second stage LSCS. Unmonitored labour can lead to second stage LSCS; hence the rate of complications of second Stage LSCS can be minimized by using partograph in labour, consistent monitoring of labour, and timely intervention, and it should be handled and operated by experienced obstetricians.

ABBREVIATIONS:

LSCS - Lower Segment Caesarean Section NICU - Neonatal Intensive Care Unit CPD - Cephalo-Pelvic Disproportion, ANC - Antenatal care, BMI - Body mass index, PPH - Postpartum haemorrhage, CTG - Cardio-toco graph

Funding: No funding sources

Conflict of interest: The authors declare that they have no conflict of interest

Ethical approval: The study was approved by the Institutional Ethics Committee

Authors' contributions:

Dr. Dhanashri patil developed the study proposal, managed the research implementation, data collection, analyzed data and wrote the manuscript. Dr. varsha deshmukh developed the study proposal, assisted with data analysis and reviewed the manuscript. Dr. Shrinivas gadappa assisted with development of the study proposal, reviewed preliminary results and reviewed the final manuscript. Dr. Aishwarya C participated in development of the study proposal, participated in research team meetings to monitor study progress. All authors have read and approved the manuscript.

REFERENCES:

1. Zipori Y, Grunwald O, Ginsberg Y, et al(2019). The impact of extending the second stage of labor to prevent primary cesarean delivery on maternal and neonatal outcomes. Am J Obstet Gynecol; 220(2):191.e1–191.e7. DOI: 10.1016/j.ajog.2018.10.028
2. Sreevidya S, Sathiyasekaran BW(2003). High caesarean rates Madras (India): a population based cross sectional study. BJOG; 110:106-111
3. Kallianidis, A. F., Schutte, J. M., van Roosmalen, J., van den Akker, T., & Maternal Mortality and Severe Morbidity Audit Committee of the Netherlands Society of Obstetrics and Gynecology (2018). Maternal mortality after cesarean

section in the Netherlands. European journal of obstetrics, gynecology, and reproductive biology, 229, 148–152. https://doi.org/10.1016/j.ejogrb.2018.08.586
4. Asicioglu, Osman & Gungorduk, Kemal & Yildirim, Gökhan & Besimoglu, Berhan& Güngördük, Ö & Ark, Cemal & Günay, T & Yenigül, N. (2014). Second-stage vs first-stage caesarean delivery: Comparison of maternal and perinatal outcomes. Journal of obstetrics and gynaecology: the journal of the Institute of Obstetrics and Gynaecology. 34. 1-7. 10.3109/01443615.2014.920790.
5. Malathi J,Sunita V(2012). Comparison of obstetric outcome between first and second stage cesarean sections in rural tertiary hospital. Int J Pharm biomed Reas: 222-25
6. Sinha, S., Malik, S., & Dixit, M. (2017). First versus second stage caesarean section: a comparison of maternal and neonatal outcomes. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 6(8), 3477-3480.
7. Dr. Anusha SR(2020). Our experience of maternal and foetal outcomes in 2nd stage caesarean deliveries-tertiary care centre study. Int J Clin Obstet Gynaecol; 4(3): 05-08. DOI:10.33545/gynae.2020.v4.i3a.566
8. Hemant D, Madhukar S, Afifa R, Chandrakant M, Monalisa S(2021). Comparative Study of Caesarean Section in First Stage of Labour and Second Stage of Labour. Gynecologist; 3(1): 1018.
9. Silver RM, Landon MB, Rouse DJ, Leveno KJ, Spong CY, Thom EA, Moawad AH, Caritis SN, Harper M, Wapner RJ et al(2006). Maternal morbidity associated with multiple repeat cesarean deliveries. Obstetrics and gynecology 2006, 107(6):1226-1232.
10. Baloch S, Khaskheli M, Khushk I A, Sheeba A(2008). Frequency of second stage intervention and it's outcome in relation with instrumental vaginal delivery versus section. J Ayub Coll Abbotabad; 20(1):87-90.
11. Murphy D J et al(2001). Early maternal and neonatal morbidity associated with operative delivery in the second stage of labor: a cohort study. Lancet; 358:1203-7.
12. Goswami KD, Parmar MM, Kunjadiya AN(2019). Study of fetomaternal outcome in second stage caesarean section. Int J Reprod Contracept Obstet Gynecol; 8(6):2169–2171. DOI: 10.18203/2320-1770.ijrcog20192129.
13. Rosenbloom JI, Stout MJ, Tuuli MG, et al(2017). New labor management guidelines and changes in cesarean delivery patterns. Am J Obstet Gynecol; 217(6):689.e1–689.e8.
14. Sung JF, Daniels KI, Brodzinsky L, et al(2007). Cesarean delivery outcomes after a prolonged second stage of labor. Am J Obstet Gynecol; 197(3):306.e1. DOI: 10.1016/j.ajog.2007.07.005.
15. Babre VM, Bendre KR, Niyogi G(2017). Review of caesarean sections at full dilatation. Int J Reprod Contracept Obstet Gynecol; 6(6):2491–2493. DOI: 10.18203/2320-1770.ijrcog20172337
16. Davis G, Fleming T, Ford K, et al(2015). Caesarean section at full cervical dilatation. Aust NZ J Obstet Gynaecol; 55(6):565–571. DOI: 10.1111/ajo.12374.
17. Kant A, Mendiratta S(2018). Classification of cesarean section through Robson criteria: an emerging concept to audit the increasing cesarean section rate. Int J Reprod Contracept Obstet Gynecol; 7(11):4674–4677. DOI: 10.18203/2320-1770.ijrcog20184528
18. Lipschuetz M, Guedalia J, Cohen SM, et al(2020). Unplanned cesarean delivery in the second stage of labor holds higher odds of complications than in the first stage, while similar in primiparas and multiparas. Fetal Diagn Ther; 47(7):565–571. DOI: 10.1159/000504573
19. Khaniya B(2020). Fetomaternal outcome in second stage caesarean section. NMJ; 3(1):279–281. DOI: 10.3126/nmj.v3i1.28923.