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Prevalence of cesarean section in a tertiary care hospital in South India: A clinical audit

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Abstract
Objective: The rapid rise in CS has become a grievous public health issue and have found increasing since the routine use of better facilities. This study assesses the common indications of LSCS and improve quality of obstetric care by taking steps to reduce unnecessary cesarean sections.
Methods: This retrospective study was conducted among 381 women who delivered by cesarean section in a duration of 1 year at Travancore Medical College, Kerala. Variables including age, parity, gestational age, CS timing (elective or emergency), indications for LSCS were collected from their case records and entered in the proforma. Descriptive statistics used for the analysis.
Results: The prevalence of LSCS was 45.84%. Out of the 381 LSCS performed, 44% were emergency cases and 56% were elective. Previous LSCS was the most common indication (153 cases, 42.5%), followed by failure of induction of labor (92 cases, 24.13%).
Conclusion: Indications for LSCS are common in most institutions globally. The most common indication in the audit was previous LSCS, followed by failed induction of labor. Efforts should be made to focus on reducing the primary LSCS rates thereby reducing common indication of previous LSCS in subsequent pregnancies.

Keywords: Cesarean indications, clinical audit, failed induction, LSCS

Introduction

Cesarean section (CS) is delivering a viable fetus after creating an incision in the abdominal wall and intact uterus [1]. Lower segment cesarean section (LSCS) is the most done procedure in obstetrics and is an important aspect of emergency obstetric care. Cesarean section can be a lifesaving intervention for mother and baby when clearly indicated or when a vaginal birth is contraindicated. Unnecessary cesarean sections pose a risk to mother and child and affect the morbidity and mortality adversely and the women's future reproductive function. It also raises the costs of delivery and maternal care [2]. The rapid rise in CS has become a grievous public health issue. Most institutions, both national and international (including WHO), state that the rates of LSCS should be between 10-15% [3], but practically, the rates are much higher. The rates have found to be increasing since the routine use of electronic fetal monitoring, better anesthesia, better operative techniques, and better neonatal facilities. The economic factor and the fear of litigation also plays an important part in the decision making for LSCS.

LSCS has been instrumental in reducing maternal and neonatal morbidity and mortality if done for proper indications. CS rate of more than 10% does not show any reductions in maternal and newborn mortality rates [4, 5]. Unfortunately, it has also led to several complications like bladder and bowel injury, morbidly adherent placenta, scar rupture, etc., in subsequent pregnancies. Recent decades have shown an increase in the CS rates [6]. CS does not show any benefits for women or infants in cases where it is not indicated. Moreover, it is associated with risks apart from the present delivery and affects the subsequent pregnancies [7]. CS may be provided after evaluating each case medically by healthcare workers [3].

In 2014, WHO concluded that LSCS rates > 10% is not associated with lower maternal and neonatal mortality and morbidity than LSCS rates <10% [8]. Therefore, the international health care community has considered the ideal rate for LSCS between 10-15% and no less than 5%. Like any surgery, CS is also associated with several risks that affect the woman's health, her baby, and future pregnancies. It has also increased the risk of morbidity related to CS, including abdominal pain, hysterectomy, ureteric and bladder injury, neonatal respiratory morbidity, fetal death, placenta accreta/placenta percreta, scar rupture in future pregnancies, etc.

A clinical audit can identify the changing trends in cesarean section indications and reduce the rates by improving obstetric care by preparing and following standard guidelines. It also helps in changing the obstetrician's attitude towards cesarean delivery. In one meta-analytic study, it was found that by doing a clinical audit, the CS rates can be reduced by 13% [9].

The term clinical audit has been defined as "in-depth analysis of the clinical performance of healthcare over a specified period of time [10]". Audit plays an important role in analyzing the changing trends in LSCS and standardizing obstetric care that will eventually reduce LSCS rates [11]. This study has been done to observe the common trends in LSCS in our institution regarding the indications and improve the quality of obstetric care by taking steps to reduce unnecessary cesarean sections.

Materials and Methods

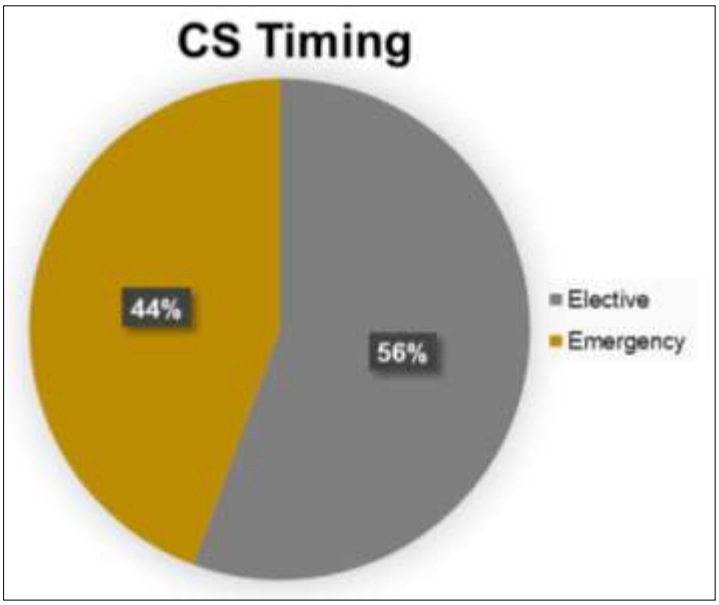
The Department of Obstetrics and Gynecology of Travancore Medical College, Kerala, conducted this retrospective study on women who underwent LSCS over a period of 1 year from December 2019 to November 2020. Out of the 831 deliveries, 381 were delivered by cesarean section. All the mothers who underwent LSCS in this hospital in the designated period were included in this study. The study excluded all those women whose documentation was incomplete or absent. Variables including age, parity, gestational age, CS timing (elective or emergency), indications for LSCS were collected from their case records and entered in the proforma. Data were analyzed using descriptive statistics. Mean and the standard deviation was used to present all quantitative variables, and frequency and percentage were used for qualitative variables. A pie chart was used to present CS timing. All data were entered in Microsoft Excel and analyzed using SPSS version 20.00.

Results

A total of 831 deliveries were performed in the study duration of 1 year, of which 381 cases underwent cesarean section. The LSCS prevalence was 45.84% in our institution. We have assessed the common indications of LSCS performed in this study population. In our study group, the range of age varies from 18 to 43 years with an average of 27.37±4.21 years, 32% of the women aged between 18-25 years, majority, i.e., 64% belongs to the age group of 26-35 years and only 4% observed in the higher age group. Out of the 381 cases, parity was distributed almost equally in this study group, i.e., 45% were primigravidae, and 55% were multigravida. 6% of the LSCS occurred at <32 weeks of gestation and 24% between 32-36 weeks. The majority of the LSCS were delivered between 37-40 weeks (70%) of gestation. Mode of conception was spontaneous for 97%, and 3% received infertility treatments (Table 1).

Table 1: Baseline characteristics of the study population

Variables		Frequency	Percentage
Age	Range	18-43	
	Mean±sd	27.37±4.21	
	18-25	123	32.28
	26-35	242	63.52
	36-45	16	4.19
Parity	Primi	172	45.14
	Multigravida	209	54.85
Gestational Age	<32 Weeks	22	5.77
	32-36 weeks	90	23.62
	37-40 weeks	269	70.6
Mode of conception	Spontaneous	371	97.37
	Treated Infertility	10	2.63



Graph 1: Distribution of Cesarean Section (CS) timing in the study group

Out of the 381 LSCS performed, 44% were emergency cases and 56% were elective (Graph 1).

Table 2: Distribution of indications for cesarean section among the study population

Indications		Frequency	Percentage
Previous LSCS	Normal	143	39.9
	With scar dehiscence	10	2.62
Failed Induction		92	24.15
Fetal distress		33	8.66
Breech presentation		25	6.56
PROM		11	2.89
CPD		18	4.72
IUGR		16	4.20
PPROM		20	5.25
Preeclampsia		11	2.89
Placenta Previa		7	1.84
Unfavourable cervix		7	1.84
Multiple gestation		5	1.31
Abruptio Placenta		4	1.05
LSCS on demand		4	1.05
Preterm labour		3	0.79
Transverse Lie		2	0.52
Anaemia		2	0.52

PROM: Premature rupture of membranes; CPD: Cephalopelvic disproportion; IUGR: Intrauterine growth restriction; PPROM: Preterm premature rupture of membranes

Table 2 shows the distribution of various indications for LSCS in the study population. LSCS was mostly done for 'previous LSCS' indication (153 cases, 42.52%), followed by failure of induction of labor (92 cases, 24.13%). Fetal distress was an indication in 33 cases (9%), Breech presentation in 25 cases (7%), PPROM in 20 (5.25%), CPD in 18 (4.72%). Other indications such as preeclampsia, placenta previa, unfavorable cervix, multiple gestation, abruptio placenta, LSCS on demand etc., was less than 3%.

Diabetes mellitus was found in 10.24% of the total LSCS population and pregnancy induced hypertension (PIH) in 3.94%. Among the 153 patients who had 'previous LSCS' as indication for present LSCS, other comorbidities such diabetes and PIH were found in 5.88% and 3.26% respectively.

Table 3: Distribution of operational findings

Operational findings		Frequency	Percentage
Lower segment	Well formed	347	91.1
	Thin	21	5.5
	Not formed	13	3.4
Adhesions	Yes	13	3.4
	No	368	96.6
Scar dehiscence	Yes	6	1.5
	No	375	98.5
Scar Rupture (No)		381	100
Scar extension (No)		381	100

Table 3 showed the findings during the procedure among the study population. It was found that the lower segment was well formed in 91%, was thin in 6% and not formed in 3% of the study population. Adhesions were observed in 3% and scar dehiscence were present in 2% of cases. Scar rupture and scar extension were not present in this study group.

Discussion

The Cesarean section prevalence rate varies globally from 1% in Sub-Saharan Africa, 30% in the USA, to 45% in Brazil [12]. This audit showed a prevalence rate of 45.84% in the institution. This is far above the accepted range of 10-15% [3]. Souza *et al*. showed a prevalence rate of 25.7% globally in their study conducted over a period of 1 year [2]. Simultaneously, the LSCS prevalence rate was 31.8% in the study conducted by Jawa *et al*. over a period of 6 months [13]. The overall Cesarean rate in India was found to be around 17%, and the rate of LSCS was found to be increasing from 8.5% to 17.2% over a period of 10 years from 2005 to 2015 [14]. But CS without indication was very less in India than other countries in the study done by Souza *et al* [2]. The study from Chennai, which was conducted over a period of 2 years, showed a CS rate of 47% in the private sector [15]. The Cesarean section, when compared showed that the rate was more in the private sector (54%) than in the public sector (24%) [16]. Analysis of the age group in this audit showed that most of the LSCS was performed in the age group of maximum fertility and this corresponds to other similar study [13, 17].

CS rate in our institution as per the audit is 45.84%. Analyzing the common indications for LSCS in our institute, the most common indication was previous LSCS (42.52%). Most clinical audits and studies done previously also showed an almost similar result [7, 11, 13, 17, 18]. Although previous LSCS without any obstetric complication is not an indication that supports a repeat LSCS, changes in the maternal and physician profile would have contributed to this increased rate. Maternal anxiety regarding the newborn infant, the obstetrician's sense of security for both the mother and the neonate seems to be responsible for repeated Cesarean sections. Medical complications like diabetes mellitus and PIH were also found in patients who had 'previous LSCS' as indication. Diabetes mellitus was found in 5.88% and PIH was found in 3.26% of the previous LSCS population. This only further increased the rate of repeat cesarean sections.

The second common indication found in this study was failed induction (24.15%), especially in primigravida. This increase in primary LSCS increases future LSCS rate. Avoiding unnecessary inductions can reduce the rate of primary LSCS. So, it entrusts every obstetrician to strictly adhere to the standard protocol for induction of labor.

The other indications for LSCS found in this study are fetal distress in 8.66%, breech presentation in 6.56%, preterm premature rupture of membranes in 5.25%, cephalopelvic disproportion in 4.72%, intrauterine growth restriction in 4.2%. Moreover, other medical complications like diabetes mellitus and PIH were found in 10.24% and 3.94% of the population, respectively. These medical complications overlapping with one or more indications would have resulted in LSCS thus increasing the prevalence rate in this institution.

Jawa A *et al*. had shown that elective LSCS was done in 25.4% of the study population, and emergency LSCS was done in 74.6% cases [13]. This study shows that emergency LSCS was performed in 44% of the study population which includes both inhouse patients as well as referrals from periphery. We had referred cases from periphery due to various complications as our institute is a tertiary care center. This is another reason for the increase in the institutional CS rate.

The demand for LSCS as an indication was found only in 1.05% of the study population in this audit. This was mainly due to the fear of vaginal delivery or labor pain, fetal risk, and avoidance of injury to pelvic floor and convenience. Obesity, advanced lifestyle with changes like unhealthy food habits with resultant obesity and sedentary lifestyle, lack of exercise during pregnancy, etc., also would have contributed to the increasing trend in LSCS. The audit did not include neonatal and maternal outcome as the primary aim of the study was to conduct an audit

on indications of LSCS. Moreover, most of the patients had one or more overlapping indications which was different in each case. Hence an association of indications with LSCS could not be performed. An audit involving more patients considering neonatal and maternal outcome would have given a better outcome.

Conclusion

Although LSCS indications seen in our institute are the same in most institutions worldwide, efforts should be made to focus on reducing the primary LSCS rates thereby reducing the most common indication of previous LSCS in subsequent pregnancies.

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