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Original Research Article

Study of caesarean section at tertiary care centre: a retrospective study

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ABSTRACT

Background: Caesarean section (C-section) is one of the most widely performed surgical procedure in obstetrics worldwide. The WHO guidelines revised in 1994 states that the proportion of C-section birth should range between 5-15% but both in developed and developing countries C-section rate is on the rise. This study was conducted to analyse the frequency and indications for C-section and associated maternal morbidity and mortality.
Methods: This retrospective study was conducted over a period from January 2018 to May 2019 at the department of obstetrics and gynecology, NKP Salve Institute of Medical Sciences and Research Centre and Lata Mangeshkar Hospital, Hingna, Nagpur, Maharashtra, India. Data of patients who delivered by C-section in our hospital during the defined study period were studied and statistically analysed according to various parameters namely, the frequency of caesarean section, its indications, age, parity and gestational age of the patient.
Results: The total number of women delivered over the study period were 2811. Out of which C-sections were done in 1461 women (51.97%). Previous C-section was the leading indication in 35.72% women followed by fetal distress 14.09%, failure of induction 12.93%, arrest of labour 7.93%, PIH 7.18%, oligo/IUGR 6.50%, breech 4.44%, refusal of vaginal birth 4.24%, CPD 1.71%, bad obstetrics history (BOH) 1.43%, malpresentation 1.30%, prematurity 1.23%, and multifetal gestation in 1.09% women. Two women had classical C-section 0.07. 14.09% women had various complications. There was no maternal mortality.
Conclusions: A high rate of caesarean deliveries was observed. Individualization of the indication and careful evaluation, following standardized guidelines can help us to limit C-section. Audit and feedback are the best way to judge clinical practice and to reduce the frequency of caesarean section in any tertiary setup.

Keywords: Foetal distress, Lower segment caesarean section, Previous caesarean section

INTRODUCTION

Caesarean section is one of the most widely performed surgical procedures in obstetrics worldwide. It was mainly evolved as a lifesaving procedure for mother and foetus during the difficult delivery.

The WHO published guidelines regarding C-section rates in 1985 which was revised in 1994. The guidelines published in 1997 by UNICEF, WHO, and UNFPA states that proportion of caesarean birth should range between 5 to 15%.[1-3] According to a research article, the global average C-section rate increased from 6.7% to 19.1% between 1990 and 2014.[4]

According to the federation of obstetric and gynaecological societies of India" the hallmark of labour management in the 21st century should be individualized care for the labouring woman with the expectation of a successful and safe vaginal delivery, together with the ability to intervene with a caesarean delivery, if needed, to prevent morbidity and mortality.[4,5]

But both in developed and developing countries C-section rate is on the raise. This study was conducted to Analyse the frequency and indications for C-section and associated maternal morbidity and mortality.

There is progressive increase in caesarean deliveries across the world; in developed as well developing countries. This increase in C-section rate has become a major public health issue, because.[6,7]

- It is a burden on health system and imposes stress on families.
- It had been observed that caesarean deliveries are associated with increased risk of maternal and Perinatal morbidity as compared to vaginal deliveries even in low risk cases.
- The rapid increase in caesarean birth rates without clear evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concern that caesarean delivery is overused.

At present there is no strictly defined protocols for the indication of C-section in our country. So, at present the decision for LSCS is mostly individualised and depends on the obstetrician taking care of the parturient WHO advises that C-section rates should not be more than 15%.[8]

India's rising rate of caesarean births is a cause for concern and signals the need for strategies to deal with it. Adverse outcomes of caesarean births include high risk of maternal and neonatal death, various maternal morbidities including infections, need for blood transfusion, neonatal morbidities related to iatrogenic prematurity, and potential complications in subsequent pregnancies.[9]

The present study was an effort to determine the frequency of C-section and evaluate the indications in the department of obstetrics and gynaecology, N. K. P. Salve Institute of Medical Sciences and Research Centre and Lata Mangeshkar Hospital, Hingna, Nagpur, Maharashtra, India. This is a step to find if any of these indications can be re-evaluated to bring down the C-section rate in the country to a level close to the standard set by WHO.

This study is aimed to find the rate of caesarean deliveries, various indications of the procedure and their relative contribution to associated maternal morbidity and mortality. So, we can analyse indications of caesarean section which can be reduced to lower the maternal and perinatal morbidity and mortality.

METHODS

This retrospective study was conducted over a period from January 2018 to May 2019 in the department of obstetrics and gynecology, N. K. P. Salve Institute of Medical Sciences and Research Centre and Lata Mangeshkar Hospital, Hingna, Nagpur, Maharashtra, India. Data of patients who delivered by C-section in our hospital during the defined study period were, studied and a statistically analysed. Records were obtained from the medical record section of our institute.

Inclusion criteria

- All women who underwent C-section (elective and emergency) at this institute during above mentioned period were included.

Exclusion criteria

- Women who delivered outside by C-section and referred to our institute post operatively for any further management and full-term normal delivery were excluded.

Various parameters like booked/unbooked cases, referral cases for C-section, indications of caesarean section, age, parity and gestational age of the women. Any associated maternal morbidity and mortality if any were noted.

The various categories of indications for caesarean sections included were repeat caesarean section, foetal distress, failed induction, arrest of labour, multiple gestation, mal- presentation, cephalopelvic disproportion (CPD), foetal indications (growth retarded foetus, big baby >3.5 kg and prematurity), maternal indications (surgery like myomectomy, medical causes that could complicate during labour like heart disease and advanced age) and obstetrics indications (placenta previa abruption, placenta accrete, cord prolapsed, pre-eclampsia/ eclampsia) etc.

Statistical analysis

These data were entered in MS excel sheet. Accuracy and confidentiality were maintained. Descriptive statistics was used for analysis. Frequency and percentage were calculated.

One of the limitations in the present study is that we are not considering neonatal outcome and remote complications associated with C-sections.

RESULTS

The total number of women who delivered at our institute over the study period were 2811.Out of which total no. of women who underwent C-section were 1461 (51.97%) and vaginal delivery were 1350 (48.03%) (Table 1).

Table 1: Total number of deliveries.

Total deliveries	2811	
Vaginal	1350	48.03%
Caesarean section	1461	51.97%

There were a total of 2811 deliveries during the study period, out of which, 1459 (51.90%) had delivered via lower segment caesarean section (LSCS). The overall C-section rate was 51.97%. The rate of primary C-section was 939 (64.27%), repeat C-section was 522 (35.72), elective C-section was 509 (34.83%) and 952 (65.16%) C-section were done as emergency procedure. CPD, previous ≥2 C-section and malpresentation were the commonest indications for elective C-section. Only 2 (0.07%) women had classical C-section. The overall C-section rate was 51.97% (Table 2).

Table 2: The caesarean section rates.

Mode of delivery	No. of cases	%
LSCS	1459	51.90%
Classical section	2	0.07%
Primary section	939	64.27%
Repeat sections	522	35.72%
Type of C-section		
Emergency CS	952	65.16%
Elective CS	509	34.83%

Out of total 1461 (51.97%) women, 138 (9.44%) women were <19 years of age. 612 (41.88%) women belonged to age group 20-25 years of age. 448 (30.66%) women were in 26-30) years of age, 195 (13.34) women were 31-35 years of age and 68 (4.65) women were in >35 years of age group. Out of these 1461 (51.97%) women, 901 (61.67%) were primigravida, whereas 560 (38.32%) were second or multi gravida. Result showed that only 982 (67.21%) of women were booked for antenatal care (Table 3).

Table 3: Age and parity in women who underwent C-section.

Age group	No. of cases	%
19 year and below (teens)	138	9.44%
20-25 years	612	41.88%
26-30 years	448	30.66%
31-35 years	195	13.34%
Above 35 years	68	4.65%
Parity		
Primipara	901	61.67%
Multipara (G2-G4)	560	38.32%
Grand multipara (G5+)	0	0%
Antenatal status		
Booked	982	67.21%
Unbooked	479	32.78%

In 323 (22.10%) C-section was done at <37 weeks. gestational age followed by 682 (46.68%) C-section in ≥ 38 weeks of gestational age and 456 (31.21%) C-section in >40 weeks of gestational age. 77.89% of the study group were term patients (Table 4).

Table 4: Percentage of C-section in relation to period of gestation.

Period of gestation	No. of cases	%
Preterm (< 37 weeks)	323	22.10%
Term (≥37 weeks)	682	46.68%
Post term (≥40 weeks)	456	31.21%

Table 5: Indications of C-section.

Indications	No. of cases	%
Prev. caesareans section	522	35.72%
Fetal distress	206	14.09%
Failure of induction	189	12.93%
Arrest of Labor	116	7.93%
PIH	105	7.18%
Oligohydramnios/IUGR	95	6.50%
Breech	65	4.44%
Refusal of vaginal birth	62	4.24%
CPD	25	1.71%
BOH	21	1.43%
Malpresentation	19	1.30%
Prematurity	18	1.23%
Multifetal gestation	16	1.09%
Total	1459	100%

Among the indications, previous LSCS was the main indication consists of 522 women (35.72%) followed by foetal distress in 206 (14.09%) in women, failure of induction 189 (12.93%), arrest of labour 116 (7.93%) in women etc. and 2 classical C-section (0.07%) in women (Table 5).

Table 6: Indications contributing to the repeat caesarean rate.

Indications	No. of cases	%
Previous caesareans section	206	39.66%
Scar tenderness	58	11.11%
PIH	56	10.72%
Oligo hydramnios /IUGR	54	10.34%
Foetal distress	38	7.27%
Refusal of vaginal birth	36	6.89%
Breech	21	4.02%
BOH	19	3.63%
Malpresentation	15	2.87%
Prematurity	12	2.29%
Multifetal gestation	7	1.34%
Total	522	100%

It was observed that commonest cause for the C-section in 206 (39.66%) women was the previous C-section followed by scar tenderness in 58 (11.11%) women, PIH in 56 (10.72%) women, Oligohydramnios /IUGR in 54 (10.34%) women, and foetal distress in 38 (7.27%) women (Table 6).

Table 7: Maternal morbidity and mortality.

Complications	No. of cases	%
Wound infection	64	4.38%
Atonic PPH	09	0.61%
UTI	57	3.90%
Gaped wound	76	5.20%
Total	206 /1461	14.09%

The caesarean sections were associated with increased risk of maternal and perinatal morbidity as compared to vaginal deliveries even in low risk cases. In present study Out of 1461 women 206 (14.09%) women had various complications mainly, gaped wound 76 (5.20%), wound infection 64 (4.38%), UTI 57 (3.90%), atonic PPH in 09 (0.61%) women and 2 (0.07%) had classical C-section. There was no maternal mortality during this period (Table 7).

DISCUSSION

In this study the total number of deliveries was 2811 and of which 1461 (51.97%) was caesarean deliveries. Increased caesarean rate is a major health concern worldwide.

There has been a steady increase in the rates of C-section in both developed and developing countries. The reasons for the increased caesarean are multifaceted. Commonly cited causes are;[2,10,11]

- Avoiding difficult manipulative or instrumental vaginal deliveries
- Foetal distress detected especially with the use continuous electronic foetal monitoring
- Liberal use of caesarean in high risk cases like Breech presentation, previous caesarean delivery, growth retarded foetus, multiple pregnancy, preterm baby
- Improved safety of C-section with better surgical techniques, anaesthesia, better availability of blood and its products, advanced antibiotics
- Busy schedule of the obstetrician specially those working in private sector and also an apprehension of the obstetrician regarding the fear of poor neonatal outcome
- Increased incidence of IVF and other high-risk pregnancy
- Increased institutional deliveries because of awareness in people
- Fear of the patient for labour pain.

Table 8: Caesarean section rates in other studies.

Study	Place	Study period	CSR%
Present study	LMH, Nagpur, Maharashtra	January 2018-May 2019	51.97%
Subudhi KT et al	Bhubaneswar, Odisha	May 2017-April 2018	35.45%
Gupta M et al	Jaipur, Rajasthan	January 2016-December 2016	32.46%
Singh G et al	Agroha, Haryana	January 2012-December 2012	51.1%
Subhashini R et al	Visakhapatnam, Andhra Pradesh	January 2014-December 2014	25.66%
Yadav RG	Vadodara, Gujarat	January 2013-December 2013	28.87%
Manjulatha B et al	Tirupati, Andhra Pradesh	January 2012-December 2012	22.20%
Shiba M et al	Mumbai, Maharashtra	January 2011-December 2011	28.93%
Samdal LJ at al	Rural Nepal	August 2014-August 2015	9.50%
Jawa A et al	Jaipur, Rajasthan	December 2015-May 2016	31.80%
Preetkamal et al	Vallah, Amritsar, Punjab	May 2015-April 2016	33.20%
Yadav S et al.	Mullana, Ambala, Haryana	Apr 2015-March 2016	21.60%
Saxena N et al	Dehradun, Uttarakhand.	January 2015-December 2015	31.40%
Sarma P et al	Sonitpur, Assam	January 2015-December 2015	27.60%
Chavda D at al	Rajkot, Gujarat	January 2015-September 2015	19.90%
Nikhil A et al	Sola, Gujarat	June 2013-December 2013	25.18%
Bade P et al	Latur, Maharashtra	March 2013-August 2013	23.97%
Padmaleela K et al	Andhra Pradesh	April 2011-March 2012	31.00%
Liu et al	Mainland China, multicenter	January 2011-December 2011	54.90%
Santhanalakshmi C et al	Maduranthagam, Tamil Nadu	January 2011-December 2014	12.5%
Bhasin SK at al	East Delhi, India	September 2003-May 2004	34.40%
Kambo I et al	30 medical colleges/teaching hospitals in India	1998-1999	25.40%

In this study the rate of caesarean section observed is 51.90%, which is almost >3 times the accepted upper norm of WHO i.e.15%.[11]

The cause for which may be as the present study is conducted in a tertiary care hospital and medical college which is situated at rural area of Nagpur City,

Maharashtra. As such, most of the cases attending the OPD and also those availing the emergency services are basically referred cases from the nearby and also some of the distant primary health centre (PHC), community health centre (CHC), sub divisional dispensaries, private hospitals and even some cases from other district and state. A team of obstetricians, anesthesiologists, and neonatologists are available round the clock for managing emergencies with well-equipped setup.

Among the indications, previous LSCS was the main indication consists of 522 women (35.72%) followed by foetal distress in 206 (14.09%) in women, failure of induction 189 (12.93%), arrest of labour 116 (7.93%) in women etc. and 2 classical C-section (0.07%) in women.

In the present study, the most common indication was previous caesarean section 522 (35.72%). Similar results were found in studies conducted by Liu et al, G Singh et al, Jawa A et al, Chavda D et al, Nikhil A et al, Prashant Bade et al and Osman BALCI et al (Table 8).[2,12,13]

Practice of trial for vaginal birth after caesarean (VBAC) is less in study hospital due to doubtful scar strength, details regarding previous C-section being not available, more no. of deliveries being conducted in the institution and more no. of referrals in late stage of labour. No trial was given to patients with previous 2 or more sections, those who presented with scar tenderness, dealing with high risk pregnancy as having IVF unit, in those previous women who refused for vaginal delivery.[2,12] The second common indication in the present study was foetal distress 206 (14.09%).

Failure of induction accounted for 189 (12.93%); arrest of labour 116 (7.93%) Breech-65 (4.44%); oligohydramnios/IUGR-95 (6.50%); PIH accounted for 105 (7.18%). Rest in decreasing order were multifetal gestation, prematurity, obstructed labour, BOH, malpresentation, CPD.

The indications of caesarean section in the present study can be compared with the following studies (Table 9).[7,12,13]

Table 9: The caesarean section indications.

Indications	Present study	Das RK et al	Sarna P et al	Jawa A et al	Chavda D et al	Bade P et al	Nikhil A et al	Balci O et al	Singh G et al
Previous C-section	35.72%	29.96%	23.00%	23.90%	39.90%	24.80%	42.09%	36.77%	29.70%
Arrest of labour	7.93%	13.93%	2.02%	5.93%	4.80%	17.60%	6.32%	9.88%	5.10%
CPD	1.71%	11.84%	30.99%	16.06%	19.10%	11.70%	10.94%	13.17%	12.1%
Fetal distress	14.09%	10.97%	2.99%	13.00%	0.90%	16.60%.	10.94%	-	25.40%
Breech/malpresentation	5.74%	6.08%	3.03%	9.37%	18.6%	6.80%	8.26%	5.48%	11.3%
Oligohydroamnios/IUGR	6.5%	5.21%	5.00%	5.93%	2.00%	4.00%	3.89%	-	-
Failed induction	12.93%	5.21%	14.00%	-	7.30%	2.90%	-	3.11%	-
PIH	7.18%	4.87%	12.99%	11.66%	-	-	1.94%	4.20%	4.80%
Prematurity	1.23%	-	-	-	-	-	-	-	-
Multifetal gestation	1.09%	-	-	-	-	-	-	-	-

The caesarean sections were associated with increased risk of maternal and perinatal morbidity as compared to vaginal deliveries even in low risk cases. In our study, the morbidity rate was found as 206 (14.09%). Gaped wound 76 (5.20%) was the commonest complication followed by wound infection 64 (4.38%), UTI 57 (3.90%) and Atonic PPH in 09 (0.61%) women and some women had post - op fever and spinal headache. These complications occur especially in emergency cases. Similar results were found in a study by Lakshmi C et al the commonest complication was wound infection (38%). The next common complications were UTI, post op fever and spinal headache, 20%, 19%, and 14.4% respectively.[7,13] Similar results were found in a study by Osman BALCI et al the morbidity rate was found as 14%. Febrile morbidity was detected 11% with postoperative endometritis, urinary tract and wound infection rates were detected 1.28%, 1.09% and 0.73% respectively.[2,14] In this study most common morbidity was gaped wound (5.20%), wound infection (4.38%) and UTI (3.90%) etc.

CONCLUSION

A high rate of caesarean deliveries was observed. Individualisation of the indication and careful evaluation, following standardized guidelines can help us to limit C-section. This may be due to being a tertiary care centre, women referred to us from nearby areas as they are not performing C-section in their setup in woman with high risk pregnancy. Previous caesarean section was the leading indication in our study which is worrisome. In conclusion it would be ideal to initiate obstetric audits by intradepartmental meetings, to assess the management of labour and indications of caesarean section in influencing outcome. Use of standardized management guidelines and practice will be helpful.

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