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Original Research Article

The rate and indication of caesarean section in a tertiary care teaching hospital eastern India

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ABSTRACT

Background: 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. To analyze the rate and indications for C-Section and associated maternal morbidity and mortality were the main objectives of present study.
Methods: This retrospective study was conducted over a period of one year from 1st May 2017 to 30th April 2018 at the Department of Pediatrics and OBG, IMS & SUM Medical college and Hospital, Bhubaneswar (Odisha), eastern India. Data of Patients who delivered by C-Section in our hospital during the defined study period was recorded and a statistical analysis of various parameters namely, the caesarean section rates, its indications, the patient's morbidity and mortality was done.
Results: The total numbers of women delivered over the study period were 1619, out of which C-Sections were 574.The overall CS rate was 35.45%. Previous LSCS was the leading indication to the CS rate (29.96%) followed by arrest of labour (13.94%), CPD (11.84%), foetal distress (10.97%), breech presentation (5.74%), oligohydroaminous/IUGR (5.21%), failed induction of labour (5.21%), pregnancy induced hypertension(PIH) (4.87%) and multifetal gestation (3.84%), prematurity (3.31%). 12.01% patients had various complications mainly infection (6.27%) and hemorrhage (3.48%). There was no mortality during this period.
Conclusions: Being a tertiary care hospital, a high rate of Caesarean deliveries was observed, Individualization of the indication and careful evaluation, following standardized guidelines, practice of evidenced-based obstetrics and audits in the institution, can help us limit CSR.

Keywords: Caesarean section, Caesarean rates, Indications of CS

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.[1]

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

- It is a burden on health system and imposes strain on families.[2]
- 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.[3]

- The rapid increase in caesarean birth rates from 1996 to 2011 without clear evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concern that caesarean delivery is overused.[4]

The indications of caesarean sections vary among institutions as there is no standard classification system exists for indications of C-Section.[5,6] A major challenge is that definitions are not standardized, and indications can be multiple or related.[7] The most common indications for primary caesarean delivery include, in order of frequency, labor dystocia, abnormal or indeterminate foetal heart rate tracing, foetal malpresentation, multiple gestation, and suspected foetal macrosomia.[4] In order to understand the degree to which caesarean deliveries may be preventable, it is important to know why caesareans performed.

This study is aimed to find the rate of caesarean deliveries, various indications of the procedure and their relative contribution to the total CSR as well associated maternal morbidity and mortality. This is a step to find out indications of LSCS which may help us to reduce the incidence rate in the institute in future.

METHODS

To observe the caesarean delivery rate and various indications contributing, the data were collected in a retrospective manner from all the deliveries that occurred during one-year period between 1st May 2017 to 30th April 2018 in the department of obstetrics and Gynecology, IMS and SUM medical college and Hospital. This is a teaching hospital and having own CHR (center for human reproduction) center. Data on all live births were collected. In cases of caesarean sections their indications were recorded along with other demographic profile like age, residence-urban/rural.

Whether procedure was done as an emergency or it was a planned surgery. Previous obstetrics history and present obstetric parameters like antenatal care, gestational age, were also recorded in the format and later entered in the Microsoft excel sheet. Complications during surgery and post-operative period were also recorded.

The various categories of indications for caesarean sections included foetal distress, repeat caesarean section, failed induction, and arrest of labour, multiple gestation, malpresentation, cephalopelvic disproportion, foetal indications, maternal indications and obstetric indications. Foetal indications included growth retarded fetuses, prematurity, big baby >3.5 kg and congenital malformations in which vaginal delivery was not possible. Maternal indications are the maternal conditions present before pregnancy that could complicate delivery like VVF repair, previous uterine surgery like myomectomy, medical causes that could complicate during labour like heart disease and advanced age. Obstetric indications are the conditions associated with present pregnancy like placenta previa, abruption, placenta accrete, cord prolapsed, pre-eclampsia eclampsia etc. Total primary and repeat caesarean deliveries were calculated. The caesarean rate was calculated as the number of deliveries in that year. The rate for each indication was calculated annually as the number of caesarean performed for each indication per 1,000 live births.

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

RESULTS

There were a total of 1619 deliveries during the study period, out of which, 574 had delivered via C-Section. The overall C-Section rate was 35.54%. The rate of primary CS was 63.41%. 63% CS were done as emergency procedure. CPD, previous ≥2 CS and malpresentation were the commonest indications for elective CS (Table 1).

Table 1: The Caesarean Section Rates.

Mode of delivery	No. of cases	%
Vaginal delivery	1045	64.55
Abdominal delivery	574	35.45
Primary/Repeat		
Primary section	364	63.41
Repeat sections	210	36.58
Type of C-section		
Emergency CS	362	63.06
Elective CS	212	36.93

Table 2: Demographic analysis of patients who underwent C-Section.

Age group	No. of cases	%
19 year and below (Teens)	18	3.13
20-25 Years	390	67.94
26-30 Years	120	20.90
31-35 Years	28	4.87
Above 35 Years	18	3.13
Parity		
Primipara	265	46.16
Multipara (G2-G4)	302	52.61
Grand multipara (G5+)	7	1.27
Antenatal Status		
Booked	402	70.03
Unbooked	172	29.96
Residence		
Urban	396	68.98
Rural	178	31.01

Maximum no. of C-sections was in the age group of 20-25 year (67.94%) followed by 20.90% patients in the age group of 26-30 years.

These two groups constituted nearly 89% of total C-Sections. Only 13.13% of the cases belonged to the elderly age group of above 35 years. Maximum no. of caesarean sections was in multiparous females (52.61%).

Out of 574 caesarean deliveries 68.98% were from urban area. Also, result showed that only 70% of women were booked for antenatal care (Table 2). 84.84% of the study group were term patients (Table 3)

Table 3: Percentage of c-section in relation to period of gestation.

Period of gestation	No. of cases	%
Preterm (<37 weeks)	57	9.93
Term (≥37 weeks)	487	84.84
Post term (≥42 weeks)	30	5.23

Table 4: Indications of C-section.

Indications	No. of cases	%
Foetal distress	68	32.38
Scar tenderness	42	20
CPD	33	15.74
>_2 caesareans section	26	12.38
PIH	6	2.85
Refusal of vaginal birth	6	2.85
Breech	5	2.38
Oligohydroamnios/IUGR	5	2.38
Big baby (BW 3.5 kg and more)	3	1.42
Multifetal gestation	3	1.42
Malpresentation	3	1.42
APH	3	1.42
Prematurity	3	1.42
Medical disorders	2	0.95
BOH	2	0.95
Total	210	100

Table 5: Indications contributing to the repeat caesarean rate. n=210.

Indications	No. of cases	%
Foetal distress	68	32.38
Scar tenderness	42	20
CPD	33	15.74
>_2 caesareans section	26	12.38
PIH	6	2.85
Refusal of vaginal birth	6	2.85
Breech	5	2.38
Oligohydroamnios/IUGR	5	2.38
Big baby (BW 3.5 kg and more)	3	1.42
Multifetal gestation	3	1.42
Malpresentation	3	1.42
APH	3	1.42
Prematurity	3	1.42
Medical disorders	2	0.95
BOH	2	0.95
Total	210	100

Among the indications, it was observed that repeat C-section (29.96%) was the commonest cause followed by cephalo-pelvic disproportion (13.94%), foetal distress (11.84%), Arrest of labour (10.97%) and breech (5.75%) (Table 4).

Commonest cause for the repeat C-section was foetal distress (32.38%) followed by scar tenderness (20 %) and CPD (15.71%) (Table 5).

12.02 patients had complication like infection (6.27%), hemorrhage (3.48%), operative injury (1.39%), anaesthetic complication (0.87) and one patient (0.17%) developed culture positive sepsis (Table 6).

Table 6: Maternal morbidity and mortality.

Complications	No. of cases	%
Wound infection-minor	25	4.35
Atonic PPH	14	2.43
Minor bladder injury	8	1.39
UTI	7	1.24
Intra operative haemorrhage	6	1.05
Anaesthetic complications	5	0.87
Gaped wound	3	0.52
Sepsis (blood culture +ve)	1	0.17
Total	69/574	12.02

DISCUSSION

The changing trends in caesarean deliveries

There has been a steady increase in the rates of CS in both developed and developing countries (Table 7).[7-14] The reasons for the increased caesarean are multifaceted.

Commonly cited causes are[10,15,16]

- Increased institutional deliveries
- 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.
- Fear of the patient for labour pain.
- 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.

It is also possible that caesarean section rates were overestimated since vaginal deliveries at home may have been underreported.

The caesarean section rates

In this study the rate of caesarean section observed is 35.45%, which is almost double the accepted upper norm of WHO ie.15%.16 The present study is conducted in a tertiary care hospital and medical college which is situated at capital of state.

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 PHC (Primary Health Centre), CHC (Community Health Centre), Sub divisional Dispensaries and the Civil Hospitals.

The hospital having own IVF center dealing with high risk pregnancy. Given the situation, it may be difficult to curtail the rates in tertiary care institutes, catering to a large population of referred cases. There exists a wide variation in caesarean rates between the developed and developing countries.

The caesarean section rare in Africa was 602% where as in United Kingdom; the CSR was 24.1% of all live births.[17,18] A study by Samdal LJ et al from rural Nepal reported CSR of 9.5%.[19] Average annual CSR in the present study can be compared with the other studies (Table 8).[7-10,12,19-32]

Table 7: Changing trends in caesarean deliveries.

Study	Place of study	Trends observed
Singh G et al	Agroha, Haryana	2007-31.0% 2012-51.1%
Subhashini R et al	Visakhapatnam, Andhra pradesh	2004-16.14% 2009-20.33% 2014-25.66%
Yadav RG	Vadodara, Gujarat	2004-23.48% 2013-28.87%
Manjulatha B et al	Tirupati, Andhra pradesh	2002-16.60% 2007-18.20% 2012-22.40%
Shabnam S	Kolkata West bengal	1973-9.50% 2012-40.10%
Mittal S et al	Mumbai, Maharashtra	2001-17.15% 2006-23.47% 2011-29.93%
Barber et al		2003-26.00% 2009-36.50%
Ba'aqeel		1997-10.60% 2006-19.10%

Table 8: The caesarean section rates.

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

The caesarean section indications

In the present study, the most common indication was previous caresarean section (29.96%). Similar results were found in studies conducted by 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.[7,20,25-27,33]

Practice of trial for vaginal birth after caesarean (VBAC) is less in our hospital due to doubtful scar strength, details regarding previous CS 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 sections was done for pelvic abnormalities and also in those women who refused for vaginal delivery.34 The second common indication in the present study was arrest of labour (13.93%). The increase in labour arrest disorders is possibly because of decrease in the difficult instrumental deliveries over a period of time in our institute.

Foetal distress accounted for 110.97%; Breech-5.74%; Oligohydramnios/IUGR-5.21%; failed induction-5.21%; PIH accounted for 4.87%. Rest in decreasing order were multifetal gestation, prematurity, obstructed labour, APH, BOH, malpresentation, cord prolapsed.

The indications of caesarean section in the present study can be compared with the following studies (Table 9).[7,20,24-27,33]

Table 9: The Caesarean Section Indications.

Indications	Present study	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	29.96%	23.00%	23.90%	39.90%	24.80%	42.09%	36.77%	29.70%
Arrest of labour	13.93%	2.02%	5.93%	4.80%	17.60%	6.32%	9.88%	5.10%
CPD	11.84%	30.99%	16.06%	19.10%	11.70%	10.94%	13.17%	12.1%
Fetal distress	10.97%	2.99%	13.00%	0.90%	16.60%	10.94%	-	25.40%
Breech/malpresentation	6.08%	3.03%	9.37%	18.6%	6.80%	8.26%	5.48%	11.3%
Oligohydroamnios/IUGR	5.21%	5.00%	5.93%	2.00%	4.00%	3.89%	-	-
Failed induction	5.21%	14.00%	-	7.30%	2.90%	-	3.11%	-
PIH	4.87%	12.99%	11.66%	-	-	1.94%	4.20%	4.80%

Demographic profile

Analysis of age of the patients showed that 88.94% of cases were in the age group of maximum fertility i.e. between 20-30 years. Other Indian studies also showed similar results.[20,24] A study of Latin American hospital showed maximum incidence in >30 years primi patients, which might reflect delayed age of marriages in the western countries.[35]

In the present study 68.98% women undergone for CS were from urban area while 31.01% women belonged to rural area. This indicates the awareness among rural women and the improved transport facilities.

Maternal morbidities and mortalities

The caesarean sections were associated with increased risk of maternal and perinatal morbidity as compared to vaginal deliveries even in low risk cases.[36] In present study, the morbidity rate was found as 12.02%. Surgical site infection (4.35%) was the commonest complication followed by atonic PPH (2.43%). These complications occur especially in emergency cases.

In a study by Santhanalakshmi 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.[30]

In a study by Osman Balci et al the morbidity rate was found as 14%. Febrile morbidity was detected as the most common with 11%.17 Postoperative endometritis, urinary tract infection and wound infection rates were detected 1.28%,1.09% and0.73% respectively.[33]

CONCLUSION

Greatest emphasis attached to foetal welfare in today's small family norm has changed the delivery practices in favour of C-Section. There is no empirical evidence for an optimum percentage. What matters most is that all women who need caesarean sections receive them (WHO Statement 2010). Safe reduction of the rate of primary caesarean deliveries will require different approaches for each indication. Individualization of the indication and careful evaluation, following standardized guidelines, practice of evidenced-based obstetrics and audits in the institution, can help us limit CSR.

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