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Original Research Article

The rate and indications of caesarean section in a tertiary care hospital at Jaipur, 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 Jan 2016 to 31st Dec 2016 at the Department of OBG, RUHS College of Medical Sciences, Jaipur (Rajasthan), North 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 2959, out of which C-Sections were 931. The overall CS rate was 31.46%. Previous LSCS was the leading indication to the CS rate (36.52%) followed by arrest of labour (13.65%), CPD (12.03%), foetal distress (11.82%), breech presentation (7.52%), oligohydroamnios/IUGR (5.16%) and failed induction of labour (3.54%). 11.60% patients had various complications mainly infection (5.58%) and haemorrhage (3.98%). 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. There is progressive increase in caesarean deliveries across the world; in developed as well developing countries.[1] 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 are 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 Jan 2016 to 31st Dec 2016 in the department of obstetrics and Gynaecology, Government RDBP Jaipuriya Hospital. This is a teaching hospital attached to RUHS-College of Medical Sciences, Jaipur (Rajasthan).

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, lie and presentation, no. of foetuses, birth weight etc. 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, arrest of labour, multiple gestation, mal-presentation, cephalopelvic disproportion, foetal indications, maternal indications and obstetric indications. Foetal indications included growth retarded foetuses, 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 accreta, cord prolapsed, pre-eclampsia/ eclampsia etc.

Total, primary and repeat caesarean deliveries were calculated. The caesarean rate was calculated as the number of caesarean birth in a year divided by total number of deliveries in that year. The rate for each indication was calculated annually as the number of caesarean births performed for each indication per 1,000 live births.

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

RESULTS

There were a total of 2959 deliveries during the study period, out of which, 931 had delivered via C-Section. The overall C-Section rate was 31.46%. The rate of primary CS was 63.48%. 62.08% 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	2028	68.54
Abdominal delivery	931	31.46
Primary/Repeat		
Primary sections	591	63.48
Repeat sections	340	36.52
Type of C-section		
Emergency CS	578	62.08
Elective CS	353	37.92

Maximum no. of C-sections was in the age group of 20-25 years (68.53%) followed by 21.58% patients in the age group of 26-30 years. These two groups constituted nearly 90% of total C-Sections. Only 1.18% of the cases belonged to the elderly age group of above 35 years. Maximum no. of caesarean sections was in multiparous females (53.82%).

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

Age group	No. of cases	%
19 years and below (teens)	30	3.23
20-25 Years	638	68.53
26-30 Years	201	21.58
31-35 Years	51	5.43
Above 35 Years	11	1.18
Parity		
Primipara	430	46.18
Multipara (G2-G4)	490	52.64
Grand multipara (G5+)	11	1.18
Antenatal Status		
Booked	636	68.31
Unbooked	295	31.69
Residence		
Urban	674	72.39
Rural	257	27.61

Out of 931 caesarean deliveries 72.39% were from urban area. Also, result showed that only 68.31% of women were booked for antenatal care (Table 2).

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

Period of gestation	No. of cases	%
Preterm (<37 weeks)	59	6.33
Term (≥37 weeks)	843	90.54
Post term (≥42 weeks)	29	3.11
Total	**931**	**100%**

90.54% of the study group were term patients (Table 3).

Table 4: Indications of C-section.

Indications	No. of cases	%
Previous C-Section	340	36.52
Arrest of Labour	127	13.65
CPD	112	12.03
Foetal Distress	110	11.82
Breech	70	7.52
Oligohydroamnios/IUGR	48	5.16
Failed Induction	33	3.54
PIH	33	3.54
Obstructed labour	27	2.90
APH	13	1.40
BOH	06	0.64
Malpresentation	05	0.53
Multifetal gestation	03	0.32
Medical disorders (excluding HDP)	02	0.21
Cord prolapse	01	0.11
Prematurity	01	0.11
Total	931	100

Table 5: Indications contributing to the repeat caesarean rate.

Indications	No. of cases	%
Foetal distress	111	32.65
Scar tenderness	71	20.87
CPD	54	15.88
≥2 caesareans section	43	12.65
PIH	11	3.24
Refusal of vaginal birth	11	3.24
Breech	10	2.94
Oligohydroamnios/IUGR	10	2.94
Big baby (BW 3.5 kg and more)	5	1.47
Multifetal gestation	4	1.18
Malpresentation	3	0.88
APH	2	0.59
Prematurity	2	0.59
Medical disorders (excluding HDP)	2	0.59
BOH	1	0.29
Total	**340**	**100**

Among the indications, it was observed that repeat C-section (36.52%) was the commonest cause followed by arrest of labour (13.65%), cephalo-pelvic disproportion (12.03%) and foetal distress (11.82%) (Table 4).

Commonest cause for the repeat C-Section was foetal distress (32.65%) followed by scar tenderness (20.87%) and CPD (15.88%) (Table 5).

Table 6: Maternal morbidity and mortality.

Complications	No. of cases	%
Wound infection-minor	41	4.40
Atonic PPH	28	3.01
Minor bladder injury	13	1.39
UTI	11	1.18
Intra operative haemorrhage	9	0.97
Anaesthetic complications	5	0.54
Gaped wound	1	0.11
Total	**108/931**	**11.60**

11.60% patients had complications like infections (5.58%), haemorrhage (3.98%), operative injury (1.39%) and anaesthetic (0.54%) complications (Table 6).

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]

Table 7: The changing trends in caesarean deliveries.

Study	Place of Study	Trends observed
G Singh et al	Agroha, Haryana	2007-31.0% 2012-51.1%
R.Subhashini 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 Shiba et al	Mumbai, Maharashtra	2001-17.15% 2006-23.47% 2011-28.93%
Barber et al		2003-26.00% 2009-36.50%
Ba'aqeel		1997-10.60% 2006-19.10%

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 of 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.

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 31.46%, which is almost double the accepted upper norm of WHO ie.15%.[16]

Table 8: The caesarean section rates

Study	Place	Study Period	CSR %
Present study	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
Prashant Bade 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 present study is conducted in a tertiary care hospital attached to medical college. As such, the 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. 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 rate in Africa was 6.2% 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]

The caesarean section indications

In the present study, the most common indication was previous caesarean section (36.52%). 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, in those previous sections was done for pelvic abnormalities and also in those women who refused for vaginal delivery.[34]

Table 9: The caesarean section indications.

Indications	Present Study	Sarna P et al	Jawa A et al	Chavda D et al	Prashant Bade et al	Nikhil A et al	Osman BALCI et al	G Singh et al
Previous C-section	36.52%	23.00%	23.90%	39.90%	24.80%	42.09%	36.77%	29.70%
Arrest of labour	13.65%	2.99%	13.00%	0.90%	16.60%	10.94%	-	25.40%
CPD	12.03%	2.02%	5.93%	4.80%	17.60%	6.32%	9.88%	5.10%
Foetal distress	11.82%	30.99%	16.06%	19.10%	11.70%	10.94%	13.17%	12.1%
Breech/malpresentation	8.05%	3.03%	9.37%	18.6%	6.80%	8.26%	5.48%	11.3%
Oligohydroamnios/IUGR	5.16%	5.00%	5.93%	2.00%	4.00%	3.89%	-	-
Failed induction	3.54%	14.00%	-	7.30%	2.90%	-	3.11%	-
PIH	3.54%	12.99%	11.66%	-	-	1.94%	4.20%	4.80%

The second common indication in the present study was arrest of labour (13.65%). 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 11.82%; Breech-7.52%; Oligohydramnios/IUGR-5.16%; failed induction-3.54%; PIH accounted for 3.54%. Rest in decreasing order were obstructed labour, APH, BOH, malpresentation, multifetal gestation, medical disorders excluding HDP, cord prolapsed and prematurity.

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

Demographic profile

Analysis of age of the patients showed that 90.11% 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 72.39% women undergone for CS were from urban area while 27.61% 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 our study, the morbidity rate was found as 11.60%. Surgical site infection (4.40%) was the commonest complication followed by atonic PPH (3.01%). 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% and 0.73% 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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