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Original Research Article

Changing trends of cesarean section using Robson's Ten-group classification in tertiary centre: a retrospective study

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ABSTRACT

Background: The aim of this study was to investigate and compare the CS rates at a tertiary care medical college setting centre which has a high referral rate of complicated pregnancies and make analysis based on the 10-group classification.
Methods: This is a retrospective study carried out department obstetrics and gynecology of a tertiary care medical college hospital in Mangalore and includes all deliveries over a period of five years from Jan 14 to Dec 2018 and it was compared with the c-section from January 2007 to December 2011.
Results: The overall CS (cesarean section) during the period 2014-18 was 31.85 which were significantly greater then 2007-11 period (20.59%). The main contributing groups to the overall CS rate were the previous CS (Group 5) and Primigravida groups, (Groups 1 and 2) 80%.
Conclusions: It is important that efforts to reduce the overall CS rate should focus on reducing the primary CS rate. The application of Robson's Ten-group classification (TGCS) in centre has helped to identify the main groups of subjects who had the overall maximum CSR.

Keywords: Caesarean rate, Robson's Ten-group classification

INTRODUCTION

Introduction of caesarean section surgery into the field of obstetrics has been associated with an improvement in maternal and overall perinatal health outcomes.[1] Caesarean section also has its own risks for maternal as well as infant morbidity and for subsequent pregnancies.[2,3] These risks will outweigh the potential benefits associated with lowering the threshold at which the procedure becomes indicated at some point.[4]

However, in many developed countries, there has been concern regarding the higher rates of caesarean section.[5] World Health Organization to advise that caesarean section (CS) rates should not be more than 15%, with some evidence that CS rates above 15% are not associated with additional reduction in maternal and neonatal mortality and morbidity.[6] Regional variation is prevalent in CSR. According to the latest data from 150 countries, Latin America and the Caribbean region have the highest CSR (40.5%), followed by Northern America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%).[1] Recently, WHO has stated that no empirical evidence exists for an ideal CSR, but "what matters the most is that all women who need caesarean sections actually receive them."[7]

In an effort to reduce the rising CSR in developed countries, the need of a standardized classification system for C-section that would allow meaningful and relevant

comparisons of CSR across different facilities, cities or regions was felt.[8] The Robson ten-group classification system is considered as a standard to critically analyze the characteristics of pregnancy with respect to the need for caesarean section.[9,10] This classification system has been used in single-institution studies, jurisdictional, and national registries and recently with international comparisons.[9,10]

The aim of this study was to investigate and compare the CS rates at a tertiary care medical college setting centre which has a high referral rate of complicated pregnancies and make analysis based on the 10-group classification.

METHODS

This is a retrospective study carried out after obtaining approval from the Institutional ethical committee of Yenepoya Medical College. This is a retrospective study includes all the hospital deliveries at the department obstetrics and gynecology of a tertiary care medical college hospital in Mangalore over a period of five years from Jan 14 to Dec 2018 and it was compared with the c-section from January 2007 to December 2011.

Exclusion criteria remained all IUFD that occurred during the study period. From the OT record book kept at the Maternity OT of the hospital, operative details of patients who had undergone C-section were obtained. From the patients' hospital inpatient number, further details of the patient were obtained from hospital records. Patients' demographic data age, parity, gravidity, pregnancy related information- gestational age, foetal presentation, number of foetuses, onset of labor, delivery details operative or vaginal delivery, indications of CS, type of C-section were recorded. Gestational age was categorized as a term ≥ 37 weeks or preterm < 37 weeks. Gestational age was assessed using early USG or LMP.

Based on patients' data, women were assigned to one of 10 groups as per Robson's 10-group classification system (Table 1). This classification system categories woman into ten mutually exclusive groups, considering the following criteria: parity, previous obstetric record of the woman, the course of labor including pre-labor duration and gestational age.

Statistical Analysis

All data obtained were recorded in master charts and analysed using SPSS version 23. Results were then presented as tables and graphs including frequencies, percentages, means and SD.

RESULTS

The total number of women delivered for the period of 5 years (2014-18) was 8972, out of which CS deliveries were 2858. Overall, CS rate calculated for hospital in this specified period was 31.85%.The analysis of CS according to Robson's classification, different rate of each group was shown separately (Table 3).

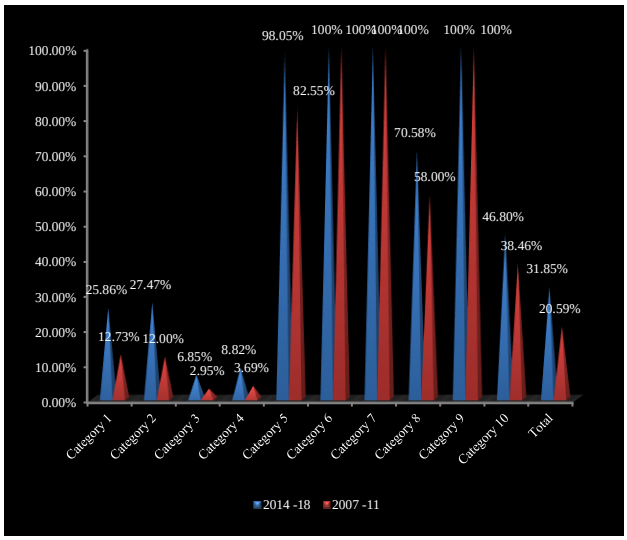

Figure 1: Distribution of caesarean sections at according to Robson's 10 Group.

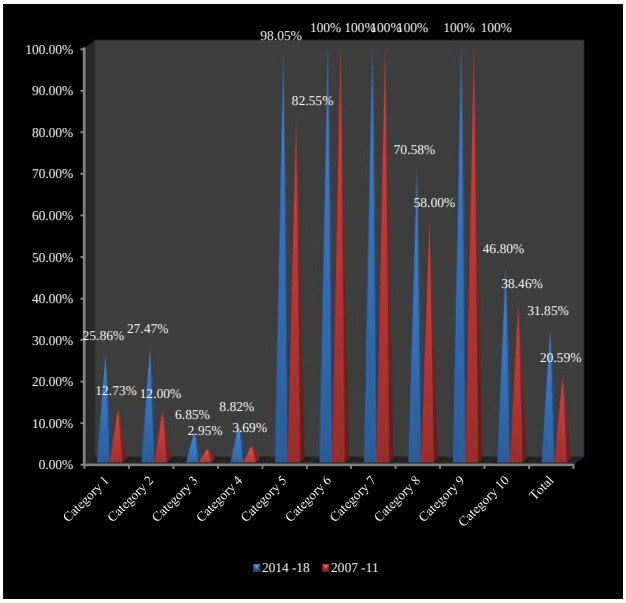

Figure 2: Comparison of percentage of CS between 2014 - 2018 and 2007 - 2011 in Robson 10 group classification.

In our study, highest contributors were women with a single cephalic presentation at term and previous CS (Group 5) contributing 45.76% to the overall CS. The second highest contributors were single cephalic women at term in spontaneous labor (Robson's Group 1) contributing 27.22% of all caesarean sections. The third highest contributor were Nulliparous, single cephalic women, >37 weeks, induced or CS (Group 2) with 11.26%. Hence, these three groups (5, 1 and 2) contribute to more than 80% of all Caesarean sections carried out during the study.

The study data was compared with the data of 2007-11 period (Table 2) of the same hospital and had found that number of deliveries increased from 6890 (2007-11) to 8972 (2014-18). In the corresponding period, CS rates rose from 1519 (22.05%) to 2858 (31.85%) (Table 4, Figure 2) and the difference was statistically significant (Table 5).

Table 1: Robson' 10-Group classification.

No.	Groups
1.	Nulliparous, single cephalic, >37 weeks in spontaneous labor
2.	Nulliparous, single cephalic, >37 weeks, induced or CS before labor
3.	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor
4.	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor
5.	Previous CS, single cephalic, >37 weeks
6.	All nulliparous breeches
7.	All multiparous breeches (including previous CS)
8.	All multiple pregnancies (including previous CS)
9.	All abnormal lies (including previous CS)
10.	All single cephalic, <36 weeks (including previous CS)

Table 2: Distribution of caesarean sections at according to Robson's 10 Group during 2007 - 2011.

Groups	Cases	LSCS	%
Nulliparous, single cephalic, >37 weeks in spontaneous labor	2409	307	12.73%
Nulliparous, single cephalic, >37 weeks, induced or CS before labor	758	91	12.00%
Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	1930	57	2.95%
Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	487	18	3.69%
Previous CS, single cephalic, >37 weeks	1095	904	82.55%
All nulliparous breeches	30	30	100%
All multiparous breeches (including previous CS)	21	21	100%
All multiple pregnancies (including previous CS)	50	29	58.00%
All abnormalies (including previous CS)	32	32	100%
All single cephalic, <36 weeks (including previous CS)	78	30	38.46%
Total	6890	1519	20.59%

Table 3: Distribution of caesarean sections at according to Robson's 10 Group during 2014-2018.

Groups	Cases	LSCS	%
Nulliparous, single cephalic, >37 weeks in spontaneous labor	3008	778	25.86%
Nulliparous, single cephalic, >37 weeks, induced or CS before labor	1136	322	27.47%
Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	2570	176	6.85%
Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	612	54	8.82%
Previous CS, single cephalic, >37 weeks	1334	1308	98.05%
All nulliparous breeches	66	66	100%
All multiparous breeches (including previous CS)	38	38	100%
All multiple pregnancies (including previous CS)	68	48	70.58%
All abnormalies (including previous CS)	46	46	100%
All single cephalic, <36 weeks (including previous CS)	94	44	46.80%
Total	8972	2858	31.85%

DISCUSSION

For the last 30 years, there has been a public concern about increasing CS rates.[9] The increase has been a global phenomenon, the timing and rate of the increase has differed from one country to another, and marked differences in rates persist.[11] The issue of rising rates of CS in India has been further brought into the limelight by a petition on Change org. by Subarna Ghosh, addressed to the Union Minister for women and Child development,

Maneka Gandhi. The petition asks the government to direct hospitals to be more transparent about the percentage of CS they conduct.[12]

While analyzing the CS rate, the number of CS performed should be simple to determine but the indications will be more difficult to standardize. There should be one main indication rather than a list of indications, using an agreed standard hierarchical system.[13] The 10-group classification has made possible comparisons of CS over time in one unit and between different units, in different countries.[9]

Table 4: Comparison of caesarean sections at according to Robson's 10 Group between 2007 - 2011 and 2014 - 2018.

Groups	2007-2011	2014-2018
Nulliparous, single cephalic, >37 weeks in spontaneous labor	307 (12.73%)	778 (25.86%)
Nulliparous, single cephalic, >37 weeks, induced or CS before labor	91 (12.00%)	322 (27.47%)
Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	57 (2.95%)	176 (6.85%)
Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	18 (3.69%)	54 (8.82%)
Previous CS, single cephalic, >37 weeks	904 (82.55%)	1308 (98.05%)
All nulliparous breeches	30 (100%)	66 (100%)
All multiparous breeches (including previous CS)	21 (100%)	38 (100%)
All multiple pregnancies (including previous CS)	29 (58%)	48 (70.58%)
All abnormalies (including previous CS)	32 (100%)	46 (100%)
All single cephalic, <36 weeks (including previous CS)	30 (38.46%)	44 (46.80%)
Total	1519 (20.59%)	2858 (31.85%)

Table 5: Comparison of total number of CS between 2007 - 2011 and 2014 - 2018.

Time Period	Total no of delivery	CS	χ^2value	P value
2007 - 2011	6890	1519	68.95	0.01
2014 - 2018	8972	2858		

In present study CSs rate escalate from 20.59%- 31.85% during the period from 2007-11 to 2014-18. As per NFHS-3, CSs were limited to 10.6 percent of all deliveries in the country, just at the recommended level of 10-15 percent. The average annual rate of increase (AARI) of India is 8 percent, which is higher than the global AARI of caesarean rate (4.4 percent) during the period.[12]

The main contributing groups to the overall CS rate were the previous CS (Group 5) and primigravida groups, (Groups 1 and 2) 80%, which is similar to other studies.[5,11,14] In all these studies, these 3 groups contributed to 50% or more of the total CS rate. The study conducted by Kazmi T et al, in Oman had found that these groups contributed 60% of the cesarean section.

Groups 6-10 were smaller groups with high percentages of CS. High percentage in these groups was due to unavoidable obstetric indications. When compared with other studies internationally, almost all studies conveyed comparable results in groups 6-10.[11,15]

The study results showed that one third (46%) of the total CS rate was contributed by Group 5 (1308 repeat CS out of 1334 laboring women with previous 1 CS), which is slightly higher than other studies (one-fourth of the total CS rate).[11,16] The reason for the larger contribution of group 5 towards the total CS rate is the bigger size of families and repeat high order CS in India.

CONCLUSION

Being a tertiary care hospital, a high rate of caesarean deliveries was observed. The percentage of caesarean was increased from 20.59% during 2007-11 periods to 31.85% during 2014-18 periods. It is important that efforts to reduce the overall CS rate should focus on reducing the primary CS rate. The Application of Robson's Ten-group classification in our centre has helped to identify the main groups of subjects who had the overall maximum CSR. Close monitoring of these groups of patients, increasing the use of instrumental delivery and practice of vaginal birth after C-section can significantly reduce the CSR in our centre.

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