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Original Research Article

Analysis of caesarean section rate in tertiary care hospital according to Robson`s 10 groups classification

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ABSTRACT

Background: The caesarean section (CS) delivery rate is steadily increasing worldwide, including India. Identifying the proportion of women in various categories as per Robson's ten group classification system and CS rate among them is important to bring down the increasing CS rate.
Methods: This case series study was conducted at Vijayanagar Institute of Medical Sciences (VIMS), a tertiary care teaching hospital in Ballari, Karnataka, India. All pregnant women who have been admitted for delivery were enrolled and the data was collected for the women delivered by CS during January 2016 to December 2016 and proportions in various groups as per Robson's ten-group classification system were calculated.
Results: Among a total of 6980 women delivered during study period, 2992 (42.8%) delivered by CS. The CS rates among various groups varied from 100% among women with abnormal lies and group 6-95% (all nulliparous breeches) group 5-94% (Previous CS, single cephalic, >37 weeks) to 10 to 15% among multiparous women with spontaneous labour having single cephalic pregnancy (group 3). Among women with previous section, CS rate was very high (89.6%). Women with previous CS (group 5) contributed maximum (40.24%) to the total number of CS.
Conclusions: In the present study, all women with breech presentation and abnormal lies delivered by CS and repeat CS was the highest contributor to all CS deliveries.

Keywords: Caesarean section, Robson's ten group classification

INTRODUCTION

Caesarean section rate (CSR) is one of the most frequently used indicators of health care quality at the national and international levels for clinical governance. The CSR has been increasing in the last 50 years, WHO suggested that optimal CSR is 15%, there seems to be little effect on the current CSR.[1,2]

The reason for the increase in caesarean births are variable including use of electronic fetal monitoring during labor, increasing number of pregnancies following infertility treatment including the multi fetal pregnancy, increasing incidence of elderly gravida, increasing number of women with prior caesarean delivery, changes in obstetric training regarding the use of instruments and medico legal concerns etc.

Rise in caesarean section rate is to be assessed for increased quality care for the pregnant woman. In order to achieve an appropriate caesarean section rate, the concept of multi-disciplinary quality assurance program needs to be implemented.[3] Four criteria will be used for assessment of maternity care: level of interventions and outcomes (including safety), choice (experience), cost and efficiency.

The philosophy is that, it is not that the caesarean section rate is high or low but rather whether it is appropriate or not after considering all the relevant information. The lack of standardized internationally accepted classification system to monitor and compare caesarean section rate is a factor preventing a better understanding this trend and underlying cause.[4] In 2011 systematic review of caesarean section concluded that women-based classification in general Robson's 10 Group Classification in particular meets the International and local needs.[5]

Robson's classification depends on women's gestation age, onset of labour, fetal presentation and number of fetuses without needing the indication of induction. Categories are totally inclusive and mutually exclusive. It can be easily classified, and it can provide the critical assessment of care at delivery. Information obtained by Robson's classification helps delivery units for the better care of women. Here in this study an effort has been done to apply the same classification in a tertiary care hospital set up.

Aims and objectives of this study was to analyze caesarean section rates at a tertiary care centre over a period of one year, based on the Robson`s 10 group classifications.

METHODS

Study design, study setting and duration

It is case series study conducted under the setting of tertiary care hospital in the department of OBG, Vijayanagar Institute of Medical Sciences (VIMS), Ballari during the year 2016.

Sample size

Since it was a time bound study, during the one year of study period, a total of 6980 pregnant women were enrolled who had come for safe confinement.

Inclusion criteria

All pregnant women who have been admitted for delivery

Exclusion criteria

Pregnant women who have less than 28 weeks of gestation.

Data variables

All pregnant women who have been admitted for delivery were enrolled and the data was collected for the women delivered by CS during January 2016 to December 2016 and proportions in various groups as per Robson's ten-group classification system were calculated.

Ethical clearance

The Institutional Ethical Committee of VIMS has issued ethical clearance for the conduct of the study.

Statistical analysis

All the collected data was entered into an excel sheet and after appropriate data cleaning, the data was transferred and analyzed using SPSS software version 22. Appropriate descriptive statistics like percentages and mean, standard deviation is used to describe the data variables.

RESULTS

The total number of women delivered during the study period was 6980, out of which CS deliveries were 2992 leading to a rate of 42.8% (Table 1). Out of the total CS deliveries, half of them in the age group of 20-24 years, followed by 25-29 years age group (29.87%), less than 20 years group (14.3%) and rest in the age group of more than 30 years group (5.7%). Similarly, out of the total CS deliveries, majority of them were in the 37-40 weeks of gestation (74%) followed by more than 40 weeks of gestation (14%) and 32-36 weeks of gestation (12%) (Table 2).

Table 1: Caesarean section rate among the study subjects.

Total deliveries	6980
No. of vaginal deliveries	3988
No. of caesarean sections	2992
Caesarean rate	42.80%

Table 2: Distribution of the caesarean section rate with respect to age and gestation.

Variable	No. of LSCS (n=2992)	Percentage
Age group		
<20 years	428	14.30%
21-24 years	1502	50.20%
25-29 years	894	29.87%
30-34 years	120	4.01%
>35 years	48	1.60%
Gestation		
32-36 weeks	359	11.99%
37-40 weeks	2214	73.99%
>40 weeks	419	14%

The incidence of the CS rate was highest in Group 9 (All abnormal lies including previous CS) 100%, Group 6 (All nulliparous breeches):95% and Group 5 (Previous CS, single cephalic, >37 weeks) 94%. The CS rate was comparatively low in Group 3 (Multiparous excluding previous CS, single cephalic, >37 weeks in spontaneous labour) 10%, Group 4 (Multiparous excluding previous

CS, single cephalic, >37 weeks, induced or CS before labour) 26.6% and Group 10 (All single cephalic, <36 weeks including previous CS) 27.6%. In rest of the groups i.e. Group 7 (All multiparous breeches including previous CS) 62%, Group 8 (All multiple pregnancies including previous CS); 49.3% Group 1 (Nulliparous, single cephalic, >37 weeks in spontaneous labour) 42.1% and Group 2 (Nulliparous, single cephalic, >37 weeks induced or CS before labour) 34.9%. Among all the groups, groups with low risk of CS like Group 1, 2 and 4 had higher CS rate comparatively.

Table 3: CS rates among women groups according to Robson's ten-groups classification system.

Group	Robson's Ten-group classification	No. of women in group	No. of CS	CS rate (%)	(%) Contribution made by each group to the overall CS n=2992
1	Nulliparous, single cephalic, >37 weeks in spontaneous labor	1440	607	42.15	20.28
2	Nulliparous, single cephalic, >37 weeks induced or CS before labour	1400	489	34.92	16.34
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labour	1280	130	10.15	4.34
4	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labour	500	133	26.6	4.44
5	Previous CS, single cephalic, >37 weeks	1280	1204	94.06	40.24
6	All nulliparous breeches	80	76	95	2.54
7	All multiparous breeches (including previous CS)	70	44	62.85	1.47
8	All multiple pregnancies (including previous CS)	83	41	49.3	1.37
9	All abnormal lies (including previous CS)	47	47	100	1.57
10	All single cephalic, <36 weeks (including previous CS)	800	221	27.62	7.38

In this study overall 2992 have undergone CS, out which pregnant women in Group 5 (40.2%) have contributed highest rates of CS followed by Group 1 (20.2%), Group 2 (16.3%), Group 10 (7.3%), Group 4 (4.4%) and Group 3 (4.3%). The rest of the groups i.e. from Group 6 to 9 contributed about 6.9% of the total cases of CS deliveries.

DISCUSSION

In this study LSCS rate was 42.8%. Although the WHO recommends that there is no justification to increase a caesarean rate in excess of 10 to 15%, it may be difficult to contain the rates in tertiary institute like VIMS, catering to a large population of referred cases. Similar high rates were observed in study by Patel RV et al (40%), Barber et al.[6,7]

Group 1 is the gold standard of any labour unit. In this study the relative size of this group is 20.6% which is large and caesarean section rate is also more in this group 20.28%. The reason for increased size of the group is thereferral system in the hospital. Proper labour management is necessary to reduce the CS rate in this group. Achieving a good uterine contraction, proper usage of oxytocin drip, use of partogram and proper dystocia treatment, fetal monitoring in the labour unit will reduce the caesarean section rate in this group.

Group 5 (previous LSCS) led to highest rate of LSCS 40.24%. This was similar to the observation made in most of the studies across India. According to a study done by Wanjari SA, in Maharashtra repeat CS accounted for 32.8% of all CS.[8] Similar results were also obtained by Shirsath A (54.5%) and Vijay K (46.1%).[9,10] Similar observation was made in a study done by Abdel -Aleem Hin Egypt where 30% CS were repeat CS.[11] It is thus important that efforts to reduce the overall CS rate should focus on reducing the primary CS rates and also encouraging VBAC in patients with previous LSCS.

As Vogel et al noticed it in a WHO survey; women who have previously had a caesarean section are an increasingly important determinant of overall caesarean

section rates in countries with a moderate or low human development index.[12] Young medical doctors are frightened by vaginal delivery after caesarean section cause to pelvis is usually only clinically assessed and CT pelvimetry is rarely done for financial reasons. Strategies to reduce the frequency of the procedure should include avoidance of medically unnecessary primary caesarean section. Improved case selection for induction and pre labour caesarean section could also reduce caesarean section rates.

Howell et al applied Robson`s classification retrospectively to Queen`s land perinatal data and found that LSCS rate have risen in all groups between 1997 and 2006.[13] Lithorp et al, on a dataset of 1,37,094 from 2000-2011 found that three largest groups (groups-1, 3 and 5) contributed most to the total LSCS rate over the study period.[14]

Pros of the Robson classification as experienced by users

Users praise the simplicity, robustness, reproducibility and flexibility of the classification; and the fact that the classification is clinically relevant and categorizes women prospectively which in turn allows the implementation and evaluation of interventions targeted at specific groups. The classification itself can be used as an intervention to reduce CS rates (22-24) and help to analyze the contribution of inductions to the overall CS rate.[15]

Cons of the Robson classification as experienced by users

Users report that the basic Robson classification identifies the contributors to the CS rate but does not provide insight into the reasons (indications) or explanations for the differences observed. The classification does not take into account other maternal and fetal factors that significantly influence the rate of CS (e.g. maternal age, pre-existing conditions such as BMI or complications) and therefore additional statistical methods (e.g. adjusting) are necessary to account for these factors.[15]

CONCLUSION

An internationally accepted classification must be implemented in all delivery units. Robson's classification is easy in collecting information about caesarean section rate. Measures to avoid unnecessary caesarean section are best found on evidence-based guidelines and quality standards.

Caesarean section can be reduced by optimal management in labour, appropriate use of augmentation, correct interpretation of fetal heart rate monitoring, senior obstetrician involvement in decision making and use of confirmatory tests where fetal compromise is suspected.

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