Original Research Article

A descriptive analysis of caesarean section rate in a tertiary care hospital according to Robson's criteria

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ABSTRACT

Background: There has been a rapid increase in rates of caesarean section (CS) in the past decade, leading to increased complications not only in the current pregnancy but also in subsequent pregnancies. Hence Robson's ten group classification has been used to analyse the indications, scrutinize the rate of CS so that only obstetrically indicated CS are carried out.
Methods: The cross-sectional study was carried out for a period of 6 months from 1/7/2019 to 31/12/2019 at Silchar medical college and hospital. All the women ≥28 weeks who delivered during the said period were taken into account. The data was then regrouped according to Robson's classification.
Results: The overall CS rate in our study was 38.09%. Most of the women who underwent CS belonged to age group 20-24 years (49%). 43.26% were nullipara and 91.86% females were term. On analysis of CS according to Robson's classification, it was observed that group 1 (35.14%) constituted the largest number of women. However, group CS rate was highest in group 9 (100%). Group 5 made the greatest relative (38.83%) as well as absolute contribution (14.79%). Fetal compromise seems to be the leading cause for primary CS.
Conclusions: The CS rates in our study have been found to be comparatively higher as the hospital is a tertiary referral centre. Since the maximum contribution has been made by the previous CS group, the rate of primary CS should be reduced and more vaginal birth after CS may be encouraged.

Keywords: CS, Robson's classification

INTRODUCTION

Caesarean section (CS) is a major obstetric intervention which involves delivery of fetus through an abdominal incision (laparotomy) and an incision in the uterus. This intervention has saved lives of thousands of women and their newborns from life-threatening complications.[1-2]

However, the past decade has witnessed an enormous surge in C-section rates globally, the average rate being 27% in both developed and developing countries during year 2013.[3] WHO has advocated caesarean rate of not more than 15%.[4]

CS leads not only to immediate complications but may also be associated with long term risk affecting the health of the woman and her baby in subsequent pregnancies.[5]

It has been observed that the increased rate in CS is often due to the fact that many of them are not medically indicated, thus posing unnecessary threats to the mother and neonate.[6] Also the rate of CS is not uniform throughout the world, the reasons being difference in institutional protocols of management, diversity in patient attributes, access to resources etc. Hence it is prudent to carry out need-based and indication-based CS, and not striving to achieve an arbitrary rate.[7]

The ten-group classification proposed by Robson has been used to critically analyse the rate of CS in a tertiary care hospital and provide a proposition so that the overall rate may be minimized. This classification has been endorsed by world health organization (WHO) and international federation of gynecology and obstetrics (FIGO) as a global standard for evaluation and comparison of CS rates within heath care institutions.[8]

This system divides deliveries into ten groups based on a set of predefined obstetric parameters including parity, previous CS, onset of labor, fetal presentation, number of fetuses and gestational age (Table 1).[9]

Table 1: Robson's classification.

Groups	Criteria
1	Nulliparous, single cephalic pregnancy, at least 37 weeks' gestation, spontaneous labour
2	Nulliparous, single cephalic pregnancy, at least 37 weeks' gestation, with either induced labour or a CS prior to the onset of spontaneous labour
3	Multiparous, no previous caesarean section, single cephalic pregnancy, at least 37 weeks' gestation, spontaneous labour
4	Multiparous, no previous CS, single cephalic pregnancy, at least 37 weeks' gestation, with either induced labour or a CS prior to the onset of spontaneous labour
5	Previous CS, single cephalic pregnancy, at least 37 weeks' gestation
6	Nulliparous, single breech pregnancy
7	Multiparous, single breech pregnancy including women with previous uterine scars
8	Multiple pregnancy including women with previous uterine scars
9	Single pregnancy with transverse or oblique lie including women with previous uterine scars
10	Single cephalic pregnancy, 37 weeks' gestation or less including women with previous uterine scars

METHODS

The cross-sectional study was carried out for a period of 6 months from 1/7/2019 to 31/12/2019 at Silchar medical college and hospital. All the women ≥28 weeks who delivered during the said period were taken into account. Laparotomy done for uterine rupture and hysterotomy before fetal viability (<28 weeks) were excluded. Age of the patient, parity, mode of previous deliveries, previous CS, gestational age, onset of labor, whether the labour was spontaneous or induced were considered through a questionnaire. The data was regrouped according to Robson's classification. The overall rate, relative and absolute contribution of each group to the overall rate as

well as CS rate within the group were considered. Data were entered in Microsoft excel and managed in SPSS version 16. Analysis was done in the form of percentages and proportions and represented as tables and figures where necessary.

RESULTS

The total number of deliveries during this tenure was 6579, out of which caesarean deliveries were 2506. Overall, CS rate was 38.09% (Figure 1).
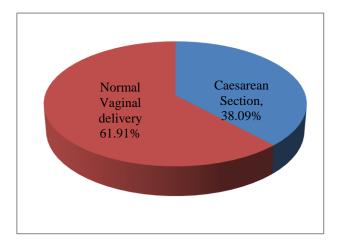

Figure 1: Rate of CS.

Table 2: Characteristics of women who delivered by CS.

Variables	No. of women who underwent LSCS	Percentage (%)
Age (in years)		
15-19	275	10.97
20-24	1228	49
25-29	701	27.97
≥30	302	12.05
Total	2506	99.99
Parity		
0	1084	43.26
≥1	1422	56.74
Total	2506	100
Gestational age (Weeks)		
<37	204	8.14
≥37	2302	91.86
Total	2506	100
Pregnancy		
Single fetus	2565	98.36
Multiple fetus	41	1.64
Total	2506	100

Most of the women who underwent CS belonged to age group 20-24 years [49%] followed by 25-29 years [27.97%]. 43.26% were nullipara and 91.86% females who underwent LSCS were term. The 98.36% of the females had singleton pregnancy (Table 2).

On analysis of CS according to Robson's classification, it was observed that group 1 (Nullipara, term, spontaneous deliveries) [35.14%] constituted the largest number of women followed by group 3 (Multipara, term, spontaneous labour). However, group CS rate was highest in group 9 (Transverse or oblique lie), amounting to 100%, followed by group 5 (previous CS group) and 6 (Nullipara, single breech pregnancy). Group 5 (previous CS group) made the greatest relative [38.83%] as well as absolute contribution [14.79%]. Group 1 (Nullipara, term, spontaneous deliveries) had the second highest contribution followed by group 2 (Nullipara, term, CS before labour onset or after failed induction) (Table 3).

Repeat or secondary caesarean [39.82%] was the most common indication. On analysis of primary CS, the most frequent reason was found to be fetal compromise [21.19%] (Table 4).

Table 3: Classification of CS according to Robson's criteria.

Groups	No. of CS in group (a)	Total women in group (b)	Group size, (%) (A)	Group CS rate, (%) (B)	Relative group contribution to overall CS rate, (%) (C)	Absolute group contribution to overall CS rate, (%) (D)
1	462	2312	35.14	19.98	18.44	7.02
2	411	595	9.04	69.08	16.4	6.25
3	160	1739	26.43	9.2	6.38	2.43
4	173	247	3.75	70.04	6.90	2.63
5	973	1180	17.94	82.46	38.83	14.79
6	130	169	2.57	76.92	5.18	1.98
7	37	75	1.14	49.33	1.48	0.56
8	41	67	1.02	61.19	1.64	0.62
9	24	24	0.37	100	0.95	0.36
10	95	171	2.60	55.56	3.79	1.44
Total	2506 (n)	6579 (N)	100	38.09	99.99	38.08

A=[number of women in the group(b)/total number of women delivered in the hospital(N)]×100, B= [number of CS in the group(a)/total number of women in the group(b)]×100, C= [number of CS in the group(a)/total number of CS in the hospital(n)]×100, D=[number of CS in the group(a)/total number of women delivered in the hospital(N)]×100.

Table 4: Indications of CS.

Indications of CS	No. of patients, (n=2506)	Percent (%)
Secondary CS (including multiple pregnancy, malpresentation, preterm CS)	998	39.82
Primary CS	1508	60.17
Compromised Fetus (fetal distress, intrauterine growth retardation, abnormal cardiotocography/ doppler, fetal bradycardia etc.)	531	21.19
Non progress of labour	245	9.78
Failed induction	202	8.06
Malpresentation (breech, transverse lie) (excludes multiparous pregnancy with previous CS)	174	6.94
Obstructed labour	96	3.83
Cephalo-pelvic disproportion	97	3.87
Antepartum haemorrhage	68	2.71
Maternal indication (Eclampsia/ gestational DM/ bad obstetric history etc.)	59	2.35
Multiple pregnancy (excludes multiparous pregnancy with previous CS)	36	1.44

DISCUSSION

The total number of deliveries in our hospital during the study period was 6579 out of which 2506 were CSs, with a caesarean rate of 38.09%. While WHO advocates a caesarean rate of not more than 10-15%, the rate was comparatively high in our study, as the hospital is the only tertiary referral centre in the southern part of Assam. The rate of CS was 34.7% in a study carried out in Ethiopia over 6 months while it was 20.3% at Khoula hospital, a tertiary care hospital in Muscat, Oman.[10,11] The rates were respectively 32.6% and 49.68% in two separate studies carried out in Puducherry and Telangana.[12,13]

Most of the women who underwent CS was in the age group 20-24 years. Since most of them belonged to low socioeconomic strata, the girls were married off at a comparatively younger age. 43.26% were nullipara and 91.86% had gestational age ≥37 weeks. The mean age of participants was 26.4 years, 47.1% were nullipara and 80.5% presented at or beyond 37 weeks in a study in Ethiopia, while a study in Bareilly found that 85.6% were in age group 21-35 years, 45.4% were nullipara and 81.6% presented ≥37 weeks.[10,14]

The overall largest groups of patients presenting for delivery at hospital were represented by groups 1 (35.14%), 3 (26.4%) and 5 (17.94%) respectively. Similar results were found in Ethiopia and India where group 1

(26.7% and 24.2% respectively) had the largest representation followed by 3 (22.2% and 19.2% respectively).[10,14] A study in Brazil found that group 3 was the largest contributor followed by group 1 and 5.[15]

The group CS rate in our study was largest in group 9 (100%) followed by group 5 (82.46%). It was also significant in groups 6 (76.92%), 4 (70.04%) and 2 (69.08%). The study in Puducherry found CS rates of 100% in groups 6, 7 and 9 and a CS rate of 89.6% in group 5.[12] The group CS rate was also found to be 100% in group 9 in study in Ethiopia, but their second highest contributor to group CS rate was group 2.[10] A study in Oman also showed group CS rate of 100% in group 9, with only 58.2% in group 5.[11] Group CS rate was highest in group 9, as the prospect of spontaneous delivery in abnormal lies is very grim. The high CS rate in group 5 (Previous CS group) was chiefly because of less number of vaginal births after CS (VBAC) due to fear of rupture uterus and other unforeseen complications. Only those patients who presented in active labour were taken up for VBAC. The higher CS rate in group 6 (nulliparous breech) was due to less rate of external cephalic version at our hospital and fear of complications related to aftercoming head of breech. Group 4 and group 2 which include CS before labour or after induction of labour also have high caesarean rate either due to failed induction or fetal compromise. Hence induction of labour should only be limited to cases with clear indication and the necessity for pre-labour CS should be well-defined.

Group 5 is the largest contributor of both relative (38.83%) and absolute (14.79%) caesarean rate. Similar findings have been reported, where group 5 made the largest representation, by studies carried out in Oman where absolute rate of group 5 was 6.79% as well as in various parts of India such as Puducherry, Telangana, Bareilly and Pune with relative contribution rate of group 5 at 40.1%, 48.9%, 34.59% and 34.9% respectively.[11-14,16]

The next largest contributor has been found to be group 1. This finding is comparable with other studies as well.[11-14,16] This group is mainly constituted by fetal distress, cephalo-pelvic disproportion, non-progress of labour, obstructed labour etc.

On analysis of indication of CS, we found that repeat CS is the most common indication. On analysis of indications of primary CS, the most common was CS done due to compromised fetus (fetal distress, intrauterine growth retardation, abnormal CTG/ doppler, fetal bradycardia etc.). Studies in Bareilly, Bangladesh and China also exhibited that compromised fetus is the most common indication of primary CS.[14,17,18]

CS, when carried out, without any proper indication, may prove to be a faulty obstetric practice and may intensify the risk of maternal morbidity and mortality, not only in the ongoing pregnancy but also in future ones, particularly in low resource countries.[19] The main target for reducing the rate should be group 5, since it has the highest depiction of caesarean rate. Counselling and exercising vaginal delivery after caesarean birth though careful monitoring and supervision should be advocated. Also, CSs due to maternal request in such cases should be curtailed.[20] For reducing the rate of repeat CS, primary CS need to be decreased as well. This can be achieved by preventing over-diagnosis of fetal compromise, reserving induction of labour only for clearly indicated cases, carrying out instrumental deliveries in suitable scenario, performing external cephalic version in malpresentation etc.[16]

The Robson categories are mutually exclusive, totally inclusive, and can be used for prospective application, so that each woman planned for delivery can fall categorically in a particular group for a standardized comparison. This would help in devising and implementing institute wise proper guidelines for carrying out CS in a judicious way.[21]

However, our study is not without limitations as it was a cross-sectional study carried out over a limited period of 6 months in a tertiary care referral hospital, where the rate of CS seems to be elevated in general. Hence, to extract more detailed information, a multicentered broader study covering a larger number of patients over a longer time period is required. Also, we have considered CS in patients with gestational age ≥28 weeks only, hence the findings of our study may not conform with those of other countries, where the age of viability is 24 weeks. Other factors such as maternal and perinatal outcome have not been considered in our study, which is again a limiting factor in drawing proper conclusions.

CONCLUSION

The results of this study cannot be generalized as it a cross-sectional study carried out in a tertiary hospital. CS rates in our study have been found to be comparatively high as the hospital in question is a referral centre. Since the maximum contribution to increased CS rate has been made by the previous CS group, the rate of primary CS should be reduced and more vaginal birth after CS should be encouraged. Robson's criteria are an internationally accepted classification which should be adopted to mitigate increasing caesarean rates and CS should be offered to only medically and obstetrically indicated women.

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