Indications For Caesarean Sections In A Tertiary Care Hospital, Mandya - A Record Based Analysis Using Robson's Ten Criteria

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Abstract

Introduction: Caesarean section rate is increasing in the world, including India (28.1% according to Indian Council of Medical Research).[1] Because of this rising trends in caesarean section rate, World Health Organization recommends to conduct institutional audits to reduce C-section rate using Robson's ten group classification system, thus postulating the institutional protocols to reduce the C-section rate.

Objectives of the study are to describe various indications of C-section as per Robson criteria ten group classification in our institute and to identify modifiable factors to reduce C-section rate in our institute.

Method: A record based study was conducted over a period of 12 months (July 2019 to June 2020) among the women who delivered through C-section in a government tertiary care centre, Mandya. All women who underwent C-section were classified according to Robson 10 group classification.

Results: Out of total 7738 women delivered during study period, 3207 women (41.1%) underwent C-section. Largest contribution to the total C-section rate was group 5, 1329(41.1%) women underwent C-section. Second largest group was group 2 (nulliparous, induced or C-section before labour) contributing to 23.4% to overall C-section rates. Modifiable indications identified were failed induction (53.2%) in group 2, failure to progress (40.1%) in group1 and repeat C-section (group 5).

Conclusion: Robson 10 group classification helps in auditing institutional C-section rate and thus formulating institutional protocols to reduce the C-section rate.

Keywords: Caesarean section, Robson ten criteria, Modifiable factors

Introduction

Caesarean section (C-Section) is defined as delivery of a baby through an incision given on an intact abdominal and uterine wall. According to World Health Organization (WHO), in 1985 the ideal rate for caesarean section was between 10-15%. Based on WHO systemic review in 2015, an increase in C-section rate above 15% was no longer associated with reduced mortality. [2]

According to Indian Council of Medical Research (ICMR) C-section rate in India has increased 28.1% (2005-06), which was 21.8% in 1993-94.[1]

In line with global trends, the C-section rate in India has increased from 8.5% in 2005–06 to 17.2% in 2015-16 (according to WHO). In the same period the C-section rate in private (including non-profit) facilities, which now account for more than 1 in 4 deliveries, has increased from 27.7 to 40.9%.[4]

A Robson criterion was proposed by Dr. Michael Robson in 2001. WHO also recommends this system as a global standard for assessing, monitoring and comparing C-Section rates within healthcare facilities over time (WHO systematic review 2011).[3]

There are 10 classes in Robson criteria which are used to find out the common causes of increased C- section rates and thereby formulating plans to reduce these rates. Identifying the indications that lead to each group's contribution to the section rates would help in formulating guidelines to reduce rates.[4,5]

Aims and Objectives

- To describe various indications of C- section as per Robson criteria ten group classification in our institute.
- To identify modifiable factors to reduce C-section rate in our institute.

Methods

This retrospective record based study was conducted from July 2019 to June 2020 (1 year) at Mandya Institute of Medical Sciences (MIMS), a tertiary care government hospital, Mandya. The research proposal was approved by the institutional ethical committee of MIMS.

Records of all women delivered during study period of one year from July 2019 to June 2020 were included in the study.

The data was collected from Medical record section, OT register, parturition register of all women who delivered during July 2019 to June 2020 and were entered in Microsoft excel sheet and analysed using SPSS version 16.0 software. Among the women delivered by C-section proportions in various groups according to Robson's ten group classification were calculated.

Results

A total of 7,738 women delivered during the study period out of it 4,531 women (58.55%) had vaginal delivery and 3,207 women (41.44%) women underwent C-section.

Among the women who delivered during the study period, according to Robson's 10-groups classification system, most of the women 2133 (27.4%) were in group 1 followed by 1562 (20.1%) women in group 2. In group 3 and 4 there were 1346 (17.3%) and 537 (6.9%) women respectively whereas group 5 constituted by 1374 (17.7%) women with previous LSCS. Of the women with breech presentations 141 (1.8%) were in group 6 that is nulliparous women and 119 (1.5%) women were multiparous (group 7). There were 62 (0.8%) women with multiple pregnancy (group 8). The smallest group was group 9, with only 29 (0.37%) women having abnormal lies. Group 10 included 445 (5.7%) women with singleton pregnancy with cephalic presentation at <37 weeks POG (Table 1).

During the study period a total of 3207 women were delivered by CS giving the CS rate of 41.4%. Among various groups, CS rate was 100% in all women with abnormal lie (group 9). Of the remaining groups CS rate was highest in group 5, where 96.7% (1329/1374) of women with previous CS were taken for CS. In the nulliparous women CS rate was higher 48% (751/1562) in group 2, (those who were induced or taken for CS before labour) as compared to those who went in spontaneous labour 25.8% (549/2133) group 1. In multiparous women also CS rate was lower 6.4% (87/1346) in those who went in spontaneous labour (group 3) where as it was higher 22.1% (119/537) in those who were induced. Among the women with multiple gestations that is group 8, 45.1% (28/62) had CS. In group 10 which included all the women with singleton cephalic fetus at less than 36 weeks period of gestation there were 112 CS out of total 445 women (25.1%) (Table 2).

On analysing the percentage contribution made by each group to overall CS rate it was observed that maximum 41.4% (1329/3207) percent of the CS were in group 5 (previous CS group). This was followed by 23.4% (751/3207) in group 2. Contribution made by other groups were 17.1% (549/3207) by group 1, 2.7% (87/3207) by group 3 and 3.7% (119/3207) by group 4. The percentage contribution made by women with nulliparous breech presentation was 3.5% (114/3207) in breech that is group 6 and 2.8% (90/3207) in multiparous breech group 7. Of all the CS done 0.87% (28/3207) were women with multiple gestation. The lowest percentage contribution 0.9% (29/367) was by group 9. The C section rate in group 10 that is women with cephalic presentation < 37 weeks was 3.4% (112/3207). (Table 2).

Majority of the women underwent C-section in view failure to progress (40.1%) in group 1. Majority of the women 53.2% underwent C-section because of failed induction in group 2.

Discussion

There has been a lot of concern about increasing trends in CS rates in last few years. This increase has been a global phenomenon affecting both the hospitals in developed and developing countries. One of the factors preventing a better understanding of this trend and underlying causes is the lack of a standardized internationally-accepted classification system to monitor and compare CS rates in a consistent and action-oriented manner. [6] A systematic review and critical appraisal of available classifications for CS in 2011 showed that women-based classifications in general, and Robson's Ten-group classification in particular, would be in the best position to fulfil current international and local needs.[7]

Dr. M. Robson proposed the following expected rates based on his experience.[8] The total number of caesareans and deliveries is the sum of the number of each event in Robson groups 1 to 10 combined.[8]

In our study the CS rate was 41.4%. Similar high rates were observed in study by Patel RV[9] around 40% and Yadav G et al[5] around 39.2% from various hospitals in India. Similar high rates of 32%-38% were also observed in a study done by Abdel-Aleem H[10] in Egypt. Our hospital being tertiary care hospital referrals of high risk cases are more hence the C-section rate is bit higher.

Groups 1 and 2 usually account for 35-40% of all deliveries; Group 1 should be larger than Group 2. In our study group 1 and 2 accounted for 47.6% and group 1 was larger than group 2. Groups 3 and 4 usually account for 30-40% of women; group 3 should be larger than group 4. In our study 24.3 % women were in group 3 and 4 and group 3 was larger than group 4. Group 5 should comprise no more than 10% of women. In our study group 5 comprised of 17.1% of women. Groups 6 and 7 should include 3-4% of all women, and group 6 is usually twice the size of group 7. Group 6 and 7 included 3.4% of all women and group 6 had 84.3% larger as compared to group 7. Group 8 should include 1.5-2% of women, unless the site has an IVF program or is a referral centre. In our study group 8 had 0.8% of women. Group 9 should comprise 0.2-0.6% of women with a CS rate of 100%. In our study group 9 comprised of 0.37% of women. Group 10 includes approximately 5% of women. In our study 5.7% women were in group 10. This is in accordance with the fact that higher proportions (6-7%) may be seen at referral centres and facilities with a high risk of preterm delivery. A CS rate for group 1 less than 10% is desirable.

In our study the CS rate in group 1 was 25.8% which was in accordance with study done in other parts of India by Dhodapkar BS[3] (23.5%), Shirsath A[11] (19.6%) and Kansara Vijay[12] (20.11%) but was higher than a similar study done in Oman by Tahira Kazmi[13] (13%). A major indication for C-section in group 1 was failure to progress in 40.1% women, which can be reduced by using partographs regularly and by appropriate use of oxytocics.

C-section rate in group 2 was 48%, which was similar to the studies conducted by Ray et al [14](45%), Dhodapkar BS[3] (33.5%). Failed induction was the main indication for C-section in 53.2% women in group 2. By making modifications in the method of induction can bring down the rate of C-section in this group.

The CS rate for Group 3 should be 2.5- 3%. In our study the CS rate in group 3 was 6.9% which again was in accordance with the studies by Dhodapkar BS[3] (5.9%), Shirsath A[11] (4.8%) and Kansara Vijay[12] (5.4%). The CS rate in Group 4 should be below 20%. The CS rate in our study in group 4 was 22.1%. This was slightly higher than that of the study done by Dhodapkar BS[3] (12.2%).

With good perinatal outcomes, a CS rate of 50-60% in Group 5 is excellent. In our study the CS rate in group 5 was 96.7% which is in accordance with those observations done by Kansara Vijay[12] (98.3%) This was higher than the CS rate in study by Dhodapkar BS[3](89.6%).

If the CS rate in Group 10 is 15-16% it suggests a high proportion of women with spontaneous onset of preterm labour. Higher CS rates (30-40%) in this Group reflect more

women with CS following preterm labour induction or a cesarean delivery without labour. In our study the CS rate in group 10 was 25.1%.

In our study women with previous CS that is group 5 made the highest contribution of 41.1% to overall CS. This was similar with the observation made in most of the studies across India. According to a study done by Wanjari SA [14] in Maharashtra repeat CS accounted for 32.8% of all CS. Similar results were also obtained by Shirsath A[11] (54.5%) and Kansara Vijay[12] (46.1%). Similar observation was made in a study done by Abdel – Aleem H[10] in Egypt where 30% CS were repeat CS. We can reduce the C-section rate by conducting vaginal birth after C-section(VBAC) in suitable cases.

Conclusion:

It is thus important that efforts to reduce the overall CS rate should focus on reducing the primary CS rates by modifying the method of induction and also encouraging vaginal birth after C-section in patients with previous LSCS.

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Table 1: Robson ten group classification system

Groups	Description
1	Nulliparous, single cephalic, $\geq$ 37 weeks, in spontaneous labor
2	Nulliparous, single cephalic, $\geq$ 37 weeks, induced or CS before labor 2a- Nulliparous, singleton, cephalic, $\geq$ 37 weeks' gestation, induced labor. 2b- Nulliparous, singleton, cephalic, $\geq$ 37 weeks' gestation, cesarean section before labor
3	Multiparous (excluding previous cesarean section), singleton, cephalic, $\geq$ 37 weeks' gestation, in spontaneous labor.
4	Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, $\geq$ 37 weeks' gestation, induced or cesarean section before labor. 4a- Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, $\geq$ 37 weeks' gestation, induced labor. 4b- Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, $\geq$ 37 weeks' gestation, cesarean section before labor
5	Previous cesarean section, singleton, cephalic, $\geq$ 37 weeks' gestation

6	All nulliparous with a single breech.
7	All multiparous with a single breech (including previous cesarean section)
8	All multiple pregnancies (including previous cesarean section)
9	All women with a single pregnancy in transverse or oblique lie (including those with previous cesarean section).
10	All singleton, cephalic, < 37 weeks' gestation pregnancies (including previous cesarean section).

Table 2: Relative size of each group according to Robson's ten-group classification system

Group number	Robson's ten-groups classification	Relative size of each group (n)	Percentage (%)
1	Nulliparous, single cephalic, >37 weeks in spontaneous labor	2133	27.4
2	Nulliparous, single cephalic, >37 weeks, induced or CS before labor	1562	20.1
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labo	1346	17.3
4	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	537	6.9
5	Previous CS, single cephalic, >37 weeks	1374	17.7
6	All nulliparous breeches	141	1.8
7	All multiparous breeches (including previous CS)	119	1.5
8	All multiple pregnancies (including previous CS)	62	0.8
9	All abnormal lies (including previous CS)	29	0.37
10	All single cephalic,<37wks (including previous LSCS)	445	5.7
	Total	**7738**	**100**

Table 3: Classification of caesarean section according to Robson ten group classification system.

Groups	CS rate in each group (%)		Contribution by each group to overall CS rate	
		(%)		**(%)**
1	549/2123	25.8	549/3207	17

2	751/1562	48	751/3207	23.4
3	87/1346	6.4	87/3207	2.7
4	119/537	22.1	119/3207	3.7
5	1329/1374	96.7	1329/3207	41.1
6	114/141	80.8	114/3207	3.5
7	90/119	75.6	90/3207	2.8
8	28/62	45.1	28/3207	0.87
9	29/29	100	29/3207	0.9
10	112/445	25.1	112/3207	3.4

Table 4: Indications for C-section in group 1

Indications	Percentage (%)
Failure to progress	40.1
Fetal distress	16
Meconium stained liqour	29.4
Cephalopelvic disproportion in labour	11.7
Oligohydramnios	1
Abnormal Doppler study	1.6

Table 5: Indications for C-section in group 2

Indications	Percentage (%)
Failed induction	53.2
Precious pregnancy	8.5
Cephalopelvic disproportion in labour	5.6
Fetal distress	2.6
MSL	2.6
Failure to preogress	1.6