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Research Article

Analysis of caesarean sections according to Robson's ten group classification system at a tertiary care teaching hospital in South India

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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 retrospective study was conducted at Pondicherry Institute of Medical Sciences (PIMS), a tertiary care teaching hospital in Puducherry, South India. The data was collected for the women delivered by CS during January 2011 to December 2011 and proportions in various groups as per Robson's ten-group classification system were calculated.
Results: Among a total of 1123 women delivered during study period, 367 (32.6%) delivered by CS. The CS rates among various groups varied from 100% among women with breach presentation (group 6 and group 7) and abnormal lies (group 9) to 5.9% among multiparous women with spontaneous labour having single cephalic pregnancy (group 3). Among women with precious section, CS rate was very high (89.6%). Women with previous CS (group 5) contributed maximum (40.1%) 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: Robson's ten group classification, Cesarean section

INTRODUCTION

The Caesarean Section (CS) delivery rate in the India has steadily increased over last 20 years. According to an Indian Council of Medical Research (ICMR) task force study, the CS rate has increased to 28.1% in 2005-06, that was 21.8% in 1993-94.[1,2] World Health Organization has recommended that Caesarean Section (CS) rates should not be more than 15%, as CS rates above this are not associated with additional reduction in maternal and neonatal mortality and morbidity.[3,4]

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 multifetal 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. The rates vary from one hospital to other and one country to other. Analyzing CS rates in different hospitals and resulting potential reasons of these, can provide important insights into this problem.

For this an appropriate classification to identify the groups of women undergoing CS and investigation of the underlying reasons for trends is essential so that appropriate effective measures to reduce CS rates can be implemented.

A systematic review of classifications for caesarean section in 2011 suggested that a women-based classifications in general and Robson's classification in particular is best for auditing, analyzing and comparing CS rates across different settings and this helps to create and implement effective strategies specifically targeted to optimize CS rates wherever necessary.[5]

The Robson ten-group classification system[6] allows analysis of CS rates according to following characteristics of pregnancy.

i. Single or multiple pregnancy.

ii. Nulliparous, multiparous, or multiparous with a previous CS.

iii. Cephalic, breech presentation or other malpresentation.

iv. Spontaneous or induced labor.

v. Term or preterm births.

The present study was conducted to find out the frequency and indications for CS in our setup and to analyze them according to Robson' ten group classification. This would be helping in adopting suitable measures to reduce the CS rate and identifying various challenges in our setting.

METHODS

This retrospective study was conducted at Pondicherry Institute of Medical Sciences (PIMS), a tertiary care teaching hospital in Puducherry, South India. The study protocol was approved by the Institute Ethics Committee of PIMS.

All the women delivered during a period of one year from January 2011 to December 2011 were included in the study.

Data collection and analysis: The data was collected from the records available in the hospital. A semi-structured questionnaire was used to collect all relevant obstetric information (parity, mode of previous deliveries, previous CS and indications, gestational age, onset of labor, spontaneous or induced labor). All the data was entered in the Microsoft excel spreadsheet 2010 and was analyzed by using SPSS version 16.0 software. Among the women delivered by CS proportions in various groups according to Robson's ten group classification were calculated.

RESULTS

A total of 1123 women delivered during the study period. Among them, according to Robson's 10-groups classification system, most of the women 374 (33.3%) were in group 1 followed by 222 (19.7%) women in group 3. In group 2 and 4 there were 155 (13.8%) and 74 (6.5%) women respectively whereas group 5 was constituted by 164 (14.6%) women with previous LSCS. Of all the women with breech presentations 20 (1.7%) were in group 6 that is nulliparous and 10 (0.8%) women were multiparous (group 7). There were 17 (1.5%) women with multiple pregnancy (group 8). The smallest group was group 9, with only 5 women having abnormal lies. Group 10 included 82 (7.3%) women with singleton pregnancy with cephalic presentation at <36 weeks' period of gestation (Table 1).

Table 1: Relative size of each group according to Robson's ten-groups classification system.

Group number	Robson's ten-groups classification	Relative size of each group	
		N	(%)
1	Nulliparous, single cephalic, >37 weeks in spontaneous labor	374	33.3
2	Nulliparous, single cephalic, >37 weeks, induced or CS before labor	155	13.8
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	222	19.7
4	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	74	6.5
5	Previous CS, single cephalic, >37 weeks	164	14.6
6	All nulliparous breeches	20	1.7
7	All multiparous breeches (including previous CS)	10	0.8
8	All multiple pregnancies (including previous CS)	17	1.5
9	All abnormal lies (including previous CS)	5	0.4
10	All single cephalic, <36 weeks (including previous CS)	82	7.3
	Total	1123	100.0

During the study period a total of 367 women were delivered by CS giving the CS rate of 32.6%.

Among various groups, CS rate was 100% in women with breech presentation either nulligravida (group 6) or multigravida (group 7) and all women with abnormal lie (group 9), where all the women were taken for CS. Of the remaining groups CS rate was highest in group 5, where 89.6% (147/164) of women with previous CS were taken for CS. In the nulliparous women CS rate was higher

33.5% (52/155) in group 2, (those who were induced or taken for CS before labour) as compared to those who went in spontaneous labour 23.5% (88/374) group 1. In multiparous women also CS rate was lower 5.9% (13/222) in those who went in spontaneous labour (group 3) where as it was higher 12.2% (9/74) in those who were induced. Among the women with multiple gestations that is group 8, 76.5% (13/17) had CS. In group 10 which included all the women with singleton cephalic fetus at less than 36 weeks period of gestation there were 27 CS out of total 82 women (32.9%) (Table 2).

Table 2: CS rates among women groups according to Robson's Ten-group classification system.

Group	Robson's ten-groups classification	Number of CS	Number of women in group	CS rate in each group (%)	(%) Contribution made by each group to the overall CS (n=367)
1	Nulliparous, single cephalic, >37 weeks in spontaneous labor	88	374	23.5	24.0
2	Nulliparous, single cephalic, >37 weeks, induced or CS before labor	52	155	33.5	14.2
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	13	222	5.9	3.5
4	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	9	74	12.2	2.5
5	Previous CS, single cephalic, >37 weeks	147	164	89.6	40.1
6	All nulliparous breeches	20	20	100.0	5.4
7	All multiparous breeches (including previous CS)	10	10	100.0	2.7
8	All multiple pregnancies (including previous CS)	13	17	76.5	3.5
9	All abnormal lies (including previous CS)	5	5	100.0	1.4
10	All single cephalic, <36 weeks (including previous CS)	27	82	32.9	7.4

On analysing the percentage contribution made by each group to overall CS rate it was observed that maximum 40.1% (147/367) percent of the CS were in group 5 (previous CS group).

This was followed by 24% (88/367) in group 1. Contribution made by other groups were 14.2% (52/367) by group 2, 3.5% (13/367) by group 3 and 2.5% (9/367) by group 4. The percentage contribution made by women with breech presentation was 5.4% (20/367) in nulliparous breech that is group 6 and 2.7% (10/367) in multiparous breech group 7. Of all the CS done 3.5% (13/367) were women with multiple gestation. The lowest percentage contribution 1.4 (5/367) was by group 9. Twenty seven (7.86%) caesarean sections were in group 10 that is women with cephalic presentation < 36 weeks. (Table 2).

Group 5 was further analyzed according to the indications of CS. Total cases of previous CS > 37 weeks delivered were 164 out of which 17 had Vaginal Birth After Caesarean (VBAC) & number of patient with repeat LSCS were 147. Out of the 147 women with previous CS, 31.2% (46) had some antenatal complication including gestational diabetes and hypertension. There were 10.8% (16) women with previous 2 CS. Of the remaining women with previous CS 22.4% (33) were not willing for trial of labor. Cephalo pelvic disproportion and contracted pelvis was the indication for repeat CS in 13.6% (20) and 5.4(8) women respectively. In 12.2% (18) women scar tenderness was there and hence they were taken for CS (Table 3).

Table 3: Indication of CS during present pregnancy in women with previous LSCS (Group 5).

Indication	Number	Percentage
Antepartum complication	46	31.2
CPD	20	13.6
Contracted pelvis	8	5.4
Fetal distress	2	1.3
Not willing for TOLAC	33	22.4
Previous 2 LSCS	16	10.8
Scar tenderness	18	12.2
Unfavourable cervix	3	2.0
Total	147	100

DISCUSSION

There has been a lot of concern about increasing CS rates in last few years.[6] This increase has been a global

phenomenon affecting both the hospitals in developed and developing countries, only difference from one hospital to another is the timing and rate of the increase. 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 2011showedthat women-based classifications in general, and Robson's Ten-group classification in particular, would be in the best position to fulfill current international and local needs.[5]

Dr. M. Robson proposed the following expected rates based on his experience.[7] The total number of cesareans and deliveries is the sum of the number of each event in Robson groups 1 to 10 combined.

In our study the CS rate was 32.6%. Similar high rates were observed in study by Patel RV[8] around 40% and 25.7% by Katke RD[9] 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.

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 47.1% 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 26.2% 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 14.6% 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 2.5% of all women and group 6 had double the number of women 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 1.63% 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 0.47% of women. Group 10 includes approximately 5% of women. In our study 7.3% women were in group 10. This is in accordance with the fact that higher proportions (6-7%) may be seen at referral centers 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 23.5% which was in accordance with study done in other parts of India by 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%). The CS rate for Group 3 should be 2.5-3%. In our study the CS rate in group 3 was 5.9% which again was in accordance with the studies by 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 12.2%. This was slightly higher than that of the study done by Shirsath A[11] (6.6%). 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 89.6% which is in accordance with those observations done by Shirsath A[11] (87.2%). This was lower than the CS rate in study by Kansara Vijay[12] (98.3%). 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 32.9%.

In our study women with previous CS that is group 5 made the highest contribution of 40.1% to overall CS. This was similar to 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.

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.

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