

ANALYSIS OF CESAREAN SECTIONS USING ROBSON'S 10 GROUP CLASSIFICATION: NEED OF THE HOUR

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ABSTRACT

Objective: The number of women delivering by cesarean sections has increased exponentially over the past decade hence making its reanalysis of absolute importance. Delving into the indications and rationale of this surgery is crucial. An audit of the cesarean sections performed in a Post-Graduate teaching institute with the use of Robson's classification.

Methods: A retrospective study was carried out for 4 years in PGI YCMH, Pimpri from January 2018 to December 2021, where details of women delivered by the cesarean section were collected. The indications for cesarean section were sorted as stated by Robson's classification and the results were analyzed.

Results: The cesarean section rate in the hospital during the study duration was 35.22%. The highest contribution to the study population was from group 2 (23.4%) and then from group 1 (18.1%) and 3 (17.5%). The lowest representations were from groups 9 (0.43%) and 8 (1.01%). Group 5 had the greatest contribution to the total cesarean section rate (44.57%) closely followed by group 2 (19.98). Group 9 had a 100% cesarean section rate even though it was only 0.43% of the population.

Conclusion: An audit of the cesarean section as an important intervention is needed and Robson's classification should be utilized in all maternity care. This will help in triaging the indications, give insights into important indications, and provide a glimpse of the burden of the intervention. This will help us to reduce unwanted cesarean sections. Robson's classification can be of great help in it; however, it has some limitations which need to be looked at.

Keywords: Cesarean section, Robson's classification, Audit.

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INTRODUCTION

Robson's classification renowned as the ten-group classification system is a universal standard endorsed by the World Health Organization (WHO) in 2015 [1] for the analysis and measurement of cesarean section rates in healthcare institutes. It divides all the women who underwent a cesarean delivery into ten groups based on obstetric history. Points that were asked in all maternity institutes-were gravida and parity status, history of previous cesarean sections, number of fetuses, age of gestation, labor onset, and fetal presentation. Women fit exclusively in only one group as the classification process is designed to do so [2].

Cesarean section rate is a useful index to gauge the approach to maternity health. Worldwide over a decade cesarean section rates were increased, and true factors for increments were argumentative. Cesarean sections were more harmful to concurrent as well as succeeding pregnancies when compared with vaginal births [3,4]. The risk of some maternal complications, such as anesthetic complications [5], thromboembolisms, injury to nearby important structures, hemorrhage, and infections are increased with the cesarean section when compared with vaginal births [4]. The objective of our study was to determine the cesarean section rate, to ascertain the group of women (classified as per Robson's criteria) contributing to the total cesarean section rate and for evaluation in the hospital.

METHODS

A retrospective study was carried out in the Department of Obstetrics and Gynecology at PGI YCMH Pimpri, Pune teaching institute in Western India. The Institutional Ethics Committee approved this study. Data

over 4 years from 2018 January to 2021 December was considered. Data were retrieved from institutional records and case papers. The overall number of confinements in that period was 28719, which were taken as the sample size.

Inclusion criteria

All the women undergoing cesarean section at the institute were included in the study.

Exclusion criteria

Women undergoing cesarean section before 28 weeks of gestation were excluded from the study.

Patients undergoing exploratory laparotomies for rupture of the uterus.

Data were collected in a pro forma, and details of the indications of the cesarean section were documented as per Robson's criteria and the women were split into ten groups.

Statistical analysis

All the group sizes, cesarean section rates with respect to number of delivery in each group, and relative cesarean section rates with respect to the total number of cesarean sections were calculated and results were calculated.

RESULTS AND DISCUSSION

During the study period, 28719 deliveries occurred in the institute out of which 10115 were cesarean sections: the rate of cesarean section was 35.22%. The year-wise data are illustrated in the table below.

Table 1: Robson's classification

Group	Description
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 <37 weeks (including previous CS)

The maximum study population in our study was from the first five groups (1, 2, 3, 4, and 5), which was (84.42%) while the past five groups only contributed (15.58%). Furthermore, the first five groups contributed 81.31% to overall cesarean sections, whereas the past 5 groups accounted for merely 18.69%.

Group 2 (23.4%) had the highest number of participants in our study and was closely followed by group 1 (18.1%) and 3 (17.51%). While group 9 (0.43%), group 8 (1.01%), and group 7 (1.22%) had minimal representations.

The single highest contributor to total cesarean section was group 5 (44.58%), while the next came from group 2 (19.98%). The contribution to the cesarean sections of the above two groups was around 2/3rd followed by some contribution from groups 1 (11.81%) and 6 (8.22%). Although group 9 had the least contribution (1.23%) to overall cesarean sections it had the maximum (100%) cesarean section rate, which implies that all the patients in this group underwent cesarean section. 93.45% of women in group 5 and 90.23% in group 6 undergone cesarean sections. Groups 3 and 4 had the lowest cesarean section rates 5.39% and 9.26%, respectively, which means that most of the women in these groups delivered vaginally.

In our study, the cesarean section rate was 35.22%. Which was way more as per the recommendation of the WHO (15%) [6]. This high rate can be attributed to the large number of high-risk pregnancies referred to our tertiary care postgraduate medical institute.

The rate in our study was slightly more in comparison to studies of Prameela *et al.* (29.33%) [7] (Karnataka, India) and by Gilani *et al.* (33.3%) [8]. Vogel *et al.* in the WHO multi-centric survey (2010–2011) noted cesarean section rates ranging from 9.8% in Nigeria to 47.6% in China [9]. PCMC's PGI, YCM Hospital is a tertiary care institute that has round-the-clock operation theatre facilities, an anaesthesia, and pediatrics department and Intensive Care Unit (ICU), and neonatal ICU facilities, so it receives numerous unregistered antenatal women and many referred patients from private and peripheral hospitals, which explains the higher cesarean section rate in our study. The same observation was found in a study by Katke *et al.* [10] and Patel *et al.* [11]. Furthermore, as we can see from Table 2. And Fig. 2., the cesarean section rates are slowly but steadily on the upward trend.

Taking a cue from his research, Robson not only formed the classification but also gave some guidelines and numbers for interpretation of the classification.

The results of our study are discussed and compared with the guidelines formulated by Robson. "35–40% of all delivery from groups 1 and 2. Group 1 should be larger than Group 2 and a cesarean section rate for Group 1 < 10% is desirable." [2].

Table 2: Year-wise data

Year	Deliveries	Vaginal deliveries	Cesarean deliveries	Percentage of cesarean deliveries
2018	9352	6173	3179	33.99
2019	9088	5940	3148	34.63
2020	3026	1969	1057	34.93
2021	7253	4522	2731	37.65
Total	28719	18604	10115	35.22

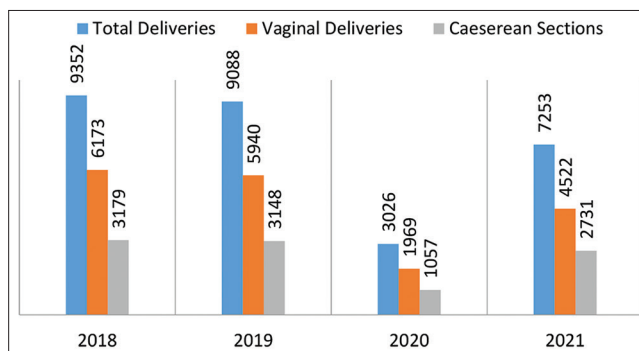


Fig. 1: Yearly data

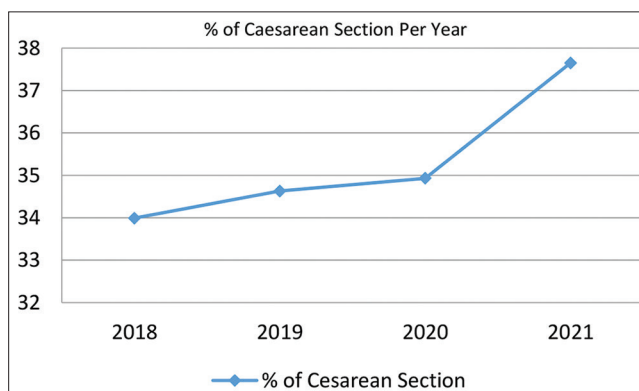


Fig. 2: Percentage of cesarean section per year

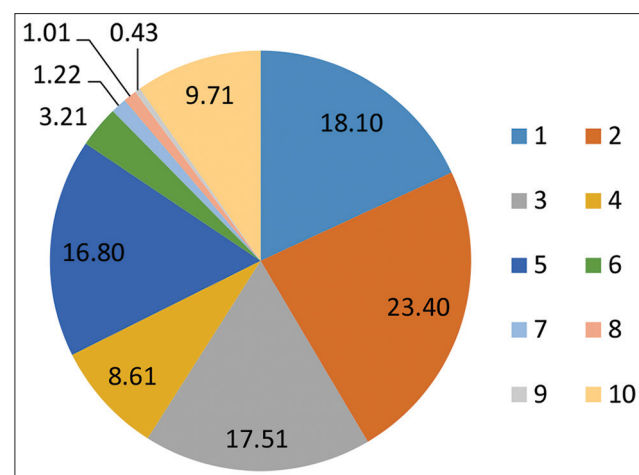


Fig. 3: Percentage of patients in each group

In our study, groups 1 and 2 had 41.5% representation as suggested by Robson, however, group 2 was a larger contributor to the study population, in group 1 (11.81%) which was just over the levels suggested by Robson. This may be due to the study being conducted at a tertiary care

center, which receives a high number of complicated cases. Most of the studies have shown that groups 1 and 2 have the maximum contribution to the overall cesarean section rate. Their joint contribution of 31.79% in our study was in conjunction with the study of Reddy et al. [12].

“Groups 3 and 4 account for 30–40% of women, group 3 should be larger than group 4. The cesarean section rate 2.5–3% for group 3 and below 20% for group 4.”[2].

Groups 3 and 4 in our study constituted 26.12% women. Group 3 had approximately 2 times the women in Group 4. The cesarean section rate in Group 3 was 2.68% while in group 4 it was 2.26% corresponding to

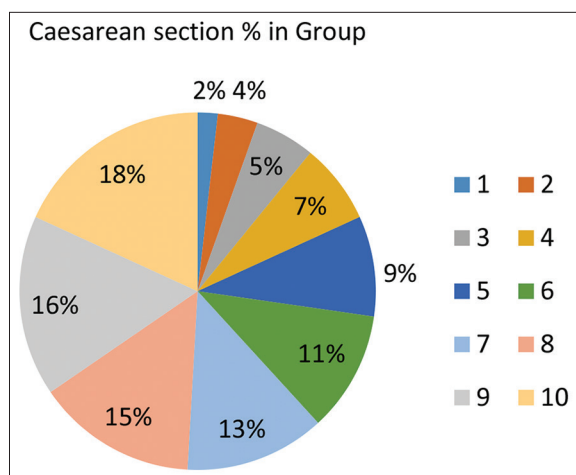


Fig. 4: Cesarean section percentage in each group

the value provided by Robson. These 2 Groups had the most percentage of vaginal deliveries in comparison to cesarean section.

“Group 5 should contain no more than 10% of women. 50–60% of cesarean section rate in group 5 indicates good perinatal outcomes.”[2].

In our study group 5 had 16.80% of representation which is more than the value suggested by Robson. It may be due to the fact that hospitals in the periphery do not want to take risks with previous cesarean section patients and refer such patients to tertiary hospitals where they undergo cesarean section without much thinking for a trial of labor after cesarean section. The findings of this where almost 93% of group 5 women underwent cesarean section was considerably greater than the figure given by Robson but was equivalent in studies by Dhodapkar et al. (89.6%) [13] and Jogia and Lodhiya (100%) [14].

“Group 6 and 7 should involve 3–4% of all women and group 6 is generally twice the size of group 7.”[2].

In our study group 6 had 3.21% and group 7 had 1.22% contribution which were equivocal with Robson’s values. Group 6 had 3 times more than the patients in group 7. The relative cesarean section rate in group 6 was 90.23% showing a reluctance for external cephalic version and assisted vaginal breech delivery. Similar numbers were seen in the study by Dhodapkar et al. [13] where 100% of women had a cesarean section.

“Group 8 should involve 1.5–2% of all women. Group 9 should include 0.2–0.6% of all women with 100% cesarean section rate.”[2].

Corresponding numbers as given by Robson are seen in this study where group 8 had 1.01% and group 9 had 0.43% representation respectively. 100% cesarean sections were noted in group 9.

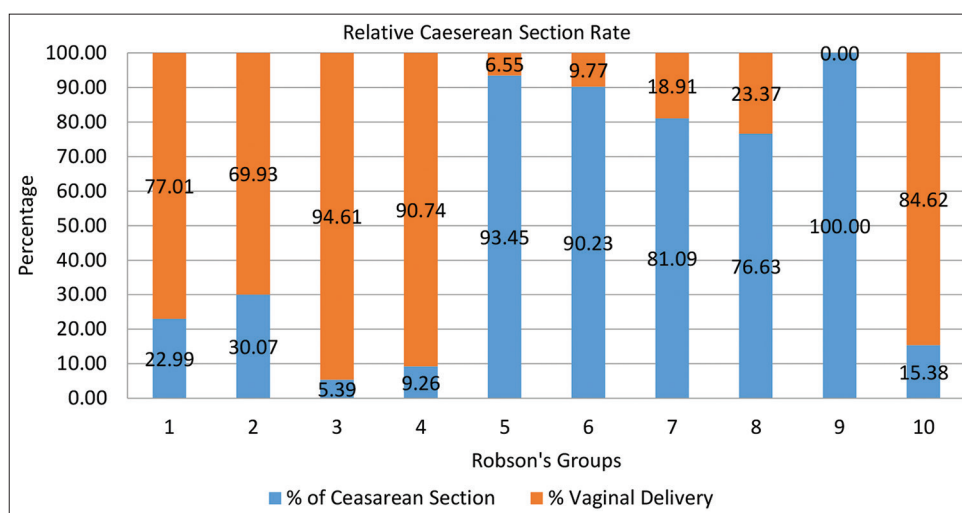


Fig. 5: % of cesarean section in relation to vaginal delivery in each group

Table 3: Distribution of patients on the basis of Robson’s groups

Robson group	Patients in group	% patients in the group	Cesarean section in the group	Cesarean section % in group	Relative % of cesarean section in group	% vaginal delivery in group
1	5197	18.1	1195	11.81	22.99	77.01
2	6721	23.4	2021	19.98	30.07	69.93
3	5028	17.51	271	2.68	5.39	94.61
4	2473	8.61	229	2.26	9.26	90.74
5	4825	16.8	4509	44.58	93.45	6.55
6	921	3.21	831	8.22	90.23	9.77
7	349	1.22	283	2.8	81.09	18.91
8	291	1.01	223	2.2	76.63	23.37
9	124	0.43	124	1.23	100	0
10	2790	9.71	429	4.24	15.38	84.62

"Group 10 involves around 5% of women. 15–16% cesarean section rate in group 10 indicates a higher proportion of women with spontaneous onset of preterm labor." [2]

Group 10 in our study comprised 9.71% population, which was almost 2 times the recommended number and almost 15% of them underwent cesarean section contributing around 4% of the cesarean section rate.

Our study noted the maximum contribution to the total cesarean section rate was from group 5 (44.58%) making the findings similar to the numbers from Dhodapkar *et al.* [13], Jogia and Lodhiya [14] and Wanjari [15].

CONCLUSION

The findings of our study do not depict the exact scenario of the entire country, as our study was carried out in a tertiary teaching institute so some of the variations with respect to cesarean section rates may be seen. However, the results are comparable with other national and international studies as mentioned in the discussion.

Group 5 and Group 2 women contribute a major part to the total cesarean section rate which brings us to implement conventional policies and regulations about vaginal delivery after previous cesarean section (VBAC) with proper maternal as well as fetal monitoring (Group 5) and only indicated labor induction (Group 2).

Cesarean section rate is increasing with patients having breech presentation (Groups 6 and 7). Hence, precise training about the external cephalic version and assisted vaginal delivery should be imparted to upcoming generations to encourage them to perform the external cephalic version to decrease the cesarean section rate in groups 6 and 7.

This study will help in auditing the indications of cesarean sections and help in the formulation of health policies for the prevention of unwanted cesarean deliveries.

Recommendations

- The first and foremost point is that everyone should accept that the rising number of cesarean sections is a problem and it needs to be solved.
- To decrease the cesarean section rate by standardizing vaginal births, for that the officials and health authorities must set in motion a plan with an organized perspective that encourages and aids vaginal delivery to reduce unnecessary cesarean section, especially in nulliparous women.
- To reduce the number of primary as well as repeat cesarean section evidence-guided interventions, initiatives, or health campaigns are needed.
- Make sure that at least one of the five common reasons (non-reassuring fetal heart rate, non-progress or obstructed labor, Cephalopelvic disproportion, pre-eclampsia, macrosomia) is justified and clinical judgment is met for each cesarean section to be performed.
- Make evidence-based criteria to help in cesarean decision-making.
- Indications of cesarean section and perinatal outcomes are not included in the Robson classification. In addition to this vital information and analysis the data may help in refining the cesarean section rate and enhance maternal and perinatal well-being.
- Use of a globally accepted system such as Robson's classification to avoid unnecessary cesarean section.

ETHICS COMMITTEE APPROVAL

Yes.

CONFLICTS OF INTERESTS

None.

AUTHORS FUNDING

Nil.

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