

## Caesarean section audit by Robson's ten group classification at a rural mission hospital in Tamil Nadu

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### Abstract:

**Background:** In last few decades there has been an increase in the caesarean section rates leading to a lot of discussion regarding the indications of caesarean section and need for caesarean section audits. World Health Organisation recommends the use of the Ten-Group Robson's classification as the global standard for assessing Caesarean Section Rate. We conducted this study to see how Robson's classification helps us to analyse Caesarean Section Rate.

**Methods:** This is a cross sectional study conducted for a period of 12 months from January 2017 to December 2017. All women delivered during this period were divided according to Robson's 10 group classification. Overall Caesarean Section Rate, relative size of each group, Caesarean Section Rate and relative contribution of each group to the overall Caesarean Section rate were calculated.

**Results:** Overall Caesarean Section Rate was 27.2%. Highest contribution to Caesarean Section Rate was by group 5 (8.61% of the total 27.2%) followed by group 1 (7.47% of the total 27.2%) and 2 (4.04% of the total 27.2%). Major indication for Caesarean Section in group 1 was non reassuring Cardiotocography (64.3%) followed by arrest of cervical dilatation (15.3%) and arrest of descent (13.3%).

**Conclusion:** Robson's classification facilitates auditing, analyzing and comparing Caesarean Section Rate across different units, hospital and settings. Regular workshops on Cardiotocography interpretation, redefining dystocia, encouraging Vaginal Birth After Caesarean section and continuing the art of external cephalic version will help in reducing and maintaining the caesarean section rate.

**Key Words:** Robson's classification, Caesarean section rates, caesarean audit

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### I. Introduction:

In last few decades there has been an increase in caesarean section rate (CSR) which has led to a lot of discussion regarding the indications of caesarean section (CS) and the need for CS audits. World Health Organization guidelines and US Healthy initiative 2000, recommended that cesarean section rate should not be beyond 15 % (1). The studies on which the WHO based this 15% recommendation about two decades ago were "limited by either having incomplete data or relying on averaged cesarean delivery rates from multiple years without accounting for year-to-year variation in these estimates" (2). Identifying the underlying factors for the continuing increase in CS could improve the efficacy of interventions to reduce CSR (3). Along with this, the use of a single CS classification will facilitate auditing, analyzing and comparing CSR across different settings and help to create and implement effective strategies to optimize CSR. In this context, Robson's ten group classification will help to look into CSR in each group, and make it easy to implement into the available perinatal data (4). Robson's system classifies deliveries into ten groups depending on five parameters : onset of labor (spontaneous induced or elective caesarean), obstetric history (parity and previous caesarean section), fetal lie and presentation, gestational age, and number of fetuses.

### II. Aims and objectives:

1. To classify the study population based on Robson's Ten-Group classification system
2. To identify which group contributes to maximum percentage of caesarean section
3. To analyse if ceasrean section rates can be brought down in these groups

### III. Methods and methodology:

This is a cross sectional study conducted for a period of 12 months from January 2017 to December 2017 at Christian Fellowship Hospital, a rural mission hospital in Dindigul district of Tamil Nadu state, India. All the women delivered during this period in the labor ward were included in the study. All relevant obstetric information (parity, mode of previous deliveries, previous CS and indications, gestational age, onset of labor whether spontaneous or induced labor) was entered on a questionnaire and then into Microsoft excel according

to original Robson's Ten-Group classification and analyzed using simple statistical measures like percentage and proportion. Overall CSR, relative size of each group, CSR in each group, and relative contribution of each group to the overall CSR were calculated after entering the data. Before proceeding, approval was sought from hospital ethical and research committee.

Robson's Ten group classification:

1. Nulliparous, single cephalic, >37 wks in spontaneous labor.
2. Nulliparous, single cephalic, >37 wks, 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, <36 wks (including previous CS).

#### IV. Results :

Total number of women who have delivered were 1,311. Out of these 357 delivered by CS, with an overall CSR of 27.2%. Table 1, shows CSR in each group as per original Robson's classification and contribution by each group to overall caesarean section rate.

Group 5 contributed maximum to the overall CSR which is 8.61%, from an overall rate of 27.2%. Within the group caesarean section rate was 97.41%. In this group, only 2 patients were willing for vaginal birth after caesarean section (VBAC). Group 1 and 2 are the next maximum contributors to the overall CSR, at 7.49% and 4.04% respectively. Indications for CS in groups 1 and 2 have been analyzed in table 2 and 3 respectively. Group 9 contributed least to the overall CSR at 0.07%. The relative size of this group is also less at 0.08%.

**Table 1** shows the overall CSR, relative size of each group, CSR in each group, and relative contribution of each group to the overall CSR as per original Robson's classification.

Robson's class	No of cs over no of deliveries in each group	Relative size of group %	CS rate in each group %	Contribution made by each group to overall CS rate of 27.2%
1	98/471	35.92(471/1311)	20.8	7.48(98/1311)
2	53/207	15.92(207/1311)	25.6	4.04(53/1311)
3	14/263	20.06(263/1311)	5.32	1.07(14/1311)
4	6/108	8.24(108/1311)	5.55	0.46(6/1311)
5	113/116	8.85(116/1311)	97.41	8.62(113/1311)
6	23/24	1.83(24/1311)	95.83	1.75(23/1311)
7	5/6	0.46(6/1311)	83.33	0.38(5/1311)
8	6/7	0.53(7/1311)	85.71	0.46(6/1311)
9	1/1	0.08(1/1311)	100	0.07(1/1311)
10	38/108	8.24(108/1311)	35.18	2.89(38/1311)

**Table 2** Indications for caesarean section in group 1

Indications	Number:	Percentage (%) contribution to the group
Non – reassuring CTG	63	64.3
Arrest of dilatation	15	15.3
Arrest of descent	13	13.3
Thick Meconium stained liquor	6	6.1
Cord prolapse	1	1.0

**Table 3** Indications for caesarean section in group 2

Indications	Number	Percentage (%) contribution to the group
Failed IOL	18	46.15
Non – reassuring CTG	15	38.46
Arrest of descent	4	10.27
Arrest of dilataion	1	2.56
Thick Meconium Stained Liquor	1	2.56

### V. Discussion:

The overall CSR in our study is 27.2%. There has always been a wide variation in the cesarean section rates between two regions or countries. Studies in India have shown wide variation in CSR, with an average CSR being 17.2%, ranging from 5.8 % in Nagaland to 58.0 % in Telangana (5). The same study also stated that, in the state of Tamil Nadu (where the present study has been conducted ) the CSR in public institutions is 26.3% and 51.3% in private institutions. Our hospital despite of being a private institution, has CSR comparable to that in the public institutions in the state. Even though, being a referral obstetric unit, the CSR is less than other private institutions as there has been a standard guidelines in the department for induction of labor (IOL), monitoring the progress of labor and also External cephalic version (ECV) is being routinely offered to all term breech pregnancies who do not have any contraindication for the procedure.

Among-st the various groups, group 5 has contributed maximum to the overall CSR (8.61%). Out of 116 participants in this group only 2 have opted for VBAC and delivered vaginally. Almost the entire study population opted against VBAC. Though several studies have stated that in previous caesarean women with non-recurrent indications, VBAC is a safe mode of delivery (6), there has been very less acceptance in the population. As this group contributes maximum to the overall CSR, any measures directed to bring down the CSR in this group will bring down the overall CSR. Few studies have stated that establishing dedicated VBAC clinics can improve VBAC rates (7). Best way to reduce the size of this group is by decreasing primary CS.

Next major contributors to the CSR are Group 1 and 2. In Group 1, CSR was 20.80%. In Group 2, out of 207 patients 14 patients were taken for CS before labor, and 193 patients were induced. In the induced group, 39 were delivered by CS. The CSR in the induced patients of group 2 was 20.21%. In our study, the CSR in spontaneous labor patients of Group 1 is similar to the induced patients in Group 2. Patients in the department are routinely induced at 40+6 wks (post dates is the most common indication for induction of labor in Group 2), and method used for induction are prostaglandin E analogues. This is similar to the findings in recent systemic reviews that have shown that IOL when offered judiciously, does not increase the CSR. One of these studies have shown significant reduction in risk of cesarean delivery with the use of prostaglandin E analogues (prostaglandin E2 and misoprostol) than the use of oxytocin and amniotomy which is still widely practiced induction methods(8). In another meta-analysis of 31 trials, it is seen that IOL is associated with a reduction in the risk of CS as compared with expectant management (9).

Major indication for CS in Group 1 (table 2) has been non reassuring cardiotocography (CTG) (64.3%), followed by arrest of dilatation (15.3%) and arrest of descent (13.3%). Major indication for CS in group 2 (table 3) was failed induction (46.15%), followed by non-reassuring CTG (38.46%). To address these issues: frequent teaching workshops for the staff can be conducted to reduce the inter-observer difference in the interpretation of CTG (10). Also, it maybe necessary to revisit and redefine labor dystocia because recent data has shown that labor progresses at a rate substantially slower than what it was historically taught (11). Studies have shown that the rate of cervical dilatation accelerates after 6 cm and progress from 4 to 6 cm was far slower than previously described (12).

Groups 6-10 have high CSR but these are all due to unavoidable indications. Only the size of Group 6 and 7 can be reduced by offering external cephalic version which is already being practiced in the department.

### VI. Conclusion:

The use of a single CS classification like Robson's classification will facilitate auditing, analyzing and comparing CS rates across different settings and help to create and implement effective strategies specifically targeted to optimize CSR where necessary. Dr Michael Robson once said "Caesarean section rates should no longer be thought of as being too high or too low, but rather whether they are appropriate or not, after taking into consideration all the relevant information." Regular workshops on CTG interpretation, redefining dystocia, encouraging VBAC and continuing the art of ECV will help in reducing and maintaining the caesarean section rate.

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