

Analysis of Caesarean Section Rate in a Tertiary Hospital – according to Robson’s 10 Group Classification System (TGCS)

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Abstract: Objective to analyze caesarean section (CS) rate, classify according to the Robson’s Classification and interpret them clinically.

Methods: The study was conducted in a tertiary hospital attached to medical college Mysuru, Karnataka. Total deliveries during 2013 were 15182, CS done were 3917. Women were classified according to Robson’s classification in 10 Group Classification System (TGCS). **Summary:** The CS rate was 25.80% - higher than stipulated WHO 15%, but lesser than other Asian countries. Group 1+2 (nulliparous, single, >37 weeks, in spontaneous labour, nulliparous single, ≥37 weeks, induced or CS before labour) size was 53.73% suggesting high number of people in the group. Ratio of Group 1+2 indicates low rate of induction and low pre-labour CS rate in this group. CS rate is slightly high in Group 1. In Group 3 (multiparous excluding previous CS single cephalic ≥37 weeks in spontaneous labour) CS rate is 12.99% which should not have been >3%. CS rate Group 4 (multiparous (excluding previous CS) ≥37 weeks, induced or CS before labour) was high at 38.68%. It contributed only 2.27% of overall CS rate. Relative size of Group 5 (previous CS, single cephalic ≥37 weeks) 8.7% suggests low CS rates in previous years. CS rate contributed highest in Group 5 at 8.48%.

Conclusion: Use of Robson’s classification for analysis of Caesarean section rate is easy. Continued classification and subdivision will help to look in to the reason of increase in CS rate Group 1, 3, 4 & 5.

Keywords Caesarean Section Rate, Robson’s Classification, TGCS.

I. Introduction

Caesarean section rate is increasing worldwide. This has raised a professional debate about appropriate indications for the operations.¹ In 1985 WHO stated caesarean section rate should be less than 15%.^{2,3} Our assumption is that low rate of caesarean section is the most appropriate and the best. Caesarean section is the most significant delivery event. Therefore it will be at the center of discussion.⁴ The caesarean section rate continues to increase worldwide, exceeding 27% in 2004.⁵ Too high in some labour rooms and too low in some. The reason not yet known.

Rise in caesarean section rate is to be assessed for increased quality care for the pregnant woman. In order to achieve an appropriate caesarean section rate, the concept of Multi Disciplinary Quality Assurance Program needs to be implemented.⁶ Four criteria will be used for assessment of maternity care: level of interventions and outcomes (including safety), choice (experience), cost and efficiency. The philosophy is that, it is not that the caesarean section rate is high or low but rather whether it is appropriate or not after considering all the relevant information. The lack of standardized internationally accepted classification system to monitor and compare caesarean section rate is a factor preventing a better understanding this trend and underlying cause.⁷ In 2011 systematic review of caesarean section concluded that women based classification in general Robson’s 10 Group Classification in particular meets the International and local needs.⁸

Robson’s classification depends on women’s gestation age, onset of labour, fetal presentation and number of fetuses without needing the indication of induction. Categories are totally inclusive and mutually exclusive. It can be easily classified and it can provide the critical assessment of care at delivery. Information obtained by Robson’s classification helps delivery units for the better care of women.

We wanted to analyze the caesarean section rate by classifying the caesarean section done in our tertiary hospital, Cheluvamba, Mysore Medical College & Research Institute, Mysuru, Karnataka. Objective was to interpret 10 group classifications, to know the highest rate or trend of caesarean section, compare with other studies, to experience classification, interpretation, implementation and any difficulty in the process of the study.

II. Methodology

This was a retrospective study. Data was collected from hospital records. All women delivered during the period of 2013 were included. Delivery notes of labour wards and operative notes of operation theatres, classifying them to the 10 Group Robson’s classification for the year 2013. Relevant information as parity, mode of previous delivery, gestation age, and onset of labour, spontaneous or induced was collected.

III. Result

Total number of women delivered during the period was 15182 out of which 3912 were Caesarean sections. These women were categorized according to Robson's classification Groups and analyzed as per the Table 1.

Table 1

GROUPS COLUMN 1	Overall CS Rate (%) 3917/15182 (25.80%) Cheluvamba Hospital 2013			
	Number of CS over total number of women in each group COLUMN 2	Relative size of groups (%) COLUMN 3	CS rate in each group (%) COLUMN 4	Contribution made by each group to the overall CS rate (%) COLUMN 5
1. Nulliparous, single cephalic, ≥ 37 weeks, in spontaneous labour	766/5924	39 5924/15182	12.95 766/5924	5.05 766/15182
2. Nulliparous, single cephalic, ≥ 37 weeks induced or CS before labour	679/2237	14.73 2237/15182	30.35 679/2237	4.47 679/15182
3. Multiparous (excluding previous CS) single cephalic, ≥ 37 weeks, in spontaneous labour	487/3750	24.70 3750/15182	12.99 487/3750	3.20 487/15182
4. Multiparous (excluding previous CS) ≥ 37 weeks induced or CS before labour	345/892	5.88 892/15182	38.68 345/892	2.27 345/15182
5. Previous CS, single cephalic ≥ 37 weeks	1287/1321	8.7 1321/15182	97.43 1287/1321	8.48 1287/15182
6. All nulliparous breeches	160/221	14.56 221/15182	72.40 160/221	1.05 160/15182
7. All multiparous breeches (including previous CS)	90/178	1.17 178/15182	50.56 90/178	0.59 90/15182
8. All multiple pregnancies (including previous CS)	19/81	0.53 81/15182	23.45 19/81	0.12 19/15182
9. All abnormal lies (including previous CS)	34/34	0.22 34/15182	100 34/34	0.22 34/15182
10. All single cephalic, ≤ 36 weeks (including previous CS)	50/544	3.58 544/15182	9.19 50/544	0.33 50/15182

IV. Discussion

Data was analyzed for overall caesarean section rate.

Groups were interpreted according to M. Robson's et. Al./ Best Practice & Research Clinical Obstetrics and Gynaecology.⁶ All groups were analyzed clinically according to Current Progress in Obstetrics & Gynaecology by John Studd.⁴ Caesarean section rate in the study was 25.80%. It was higher than WHO criteria of 15% CS rate. But lesser than Australia (28%) in Tasmania (33%) in Queensland^{10,11} and 27% in United States of America.¹ Asian countries 27.3%.¹² Rate of caesarean section can be reduced by efficient uterine contraction and limiting the induction, pre labour CS. Induction of labour continues to be the cause of increase in the CS rate.

TGCS allows unique analysis of this. Group 1 (nulliparous, single, > 37 weeks, in spontaneous labour), 2 (nulliparous, single, ≥ 37 weeks, induced or CS before labour) and 5 (previous CS, single cephalic ≥ 37 weeks) contributes to the two thirds of overall CS rate. In our study Group 5 made the greatest contribution to the total caesarean section rate 8.48%. Group 1 has the second highest contribution to the CS rate at 5.50%, then comes Group 2 at 4.47%. In our study Group 3 (multiparous (excluding previous CS) single cephalic ≥ 37 weeks spontaneous labour) also contributed 3.2% to overall CS rate.

4.1 Interpretation of results of the study Ten group classification system according to M. Robson's et. Al./ Best Practice & Research Clinical Obstetrics and Gynaecology.⁶

1. The groups are mutually inclusive and totally exclusive so all numerators and denominators should add up to the total numerator and the total denominator. In our study also all numerators and denominators added up to total numerator and total denominator.
2. In Group 9 (All abnormal lies (including previous CS)) the relative size in third column should be 0.2-0.6% and the CS rate should be 100%. In our study the relative size and CS rate corresponds to the same.
3. In column 3, Group 1 plus 2 usually contains 35-42% of total woman. In our study it is 53.73% of total women. The increase in size may be due to inappropriate data collection or due to the referral system of the tertiary hospital. The ratio of Group 1 and Group 2 is more than 2:1, suggesting less induction and pre labour caesarean section rate. Caesarean section rate in Group 2 is 30% which also suggests less of pre labour caesarean section.

4. In column 3, Group 3 and 4 combined, usually contains 30-40% of women. In our study also Group 3 and 4 combined, constitute 30.58%. Ratio of Group 3 and 4 is greater than Group 1 and 2. (4:1 > 2.78:1). Group 4 (multiparous (excluding previous CS) ≥ 37 weeks, induced or CS before labour) has a caesarean section rate of 38.68% suggesting high pre labour caesarean section in multiparous women. This may be due to high referral of more number of multiparous women with no live babies to the hospital.
5. In column 3, Group 5 the size is 8.7%. A rate less than 10% suggests previous low caesarean section rate.
6. In column 3, Group 6 (All nulliparous breeches) and 7 (All multiparous breeches (including previous CS)) combined should contain 3-4% of women. In our study the relative size is 2.63%, suggesting low premature delivery rate. This also correlated with the column 3, Group 10 (All single cephalic, ≤ 36 weeks (including previous CS)) which is 3.58% and is less than 4-5% confirming the less premature delivery rate.
7. In column 3, Group 8 (All multiple pregnancies (including previous CS)) should contain 1.5-2% of women. The relative size in our study is 0.53% and is less though it is a tertiary hospital.
8. In column 3, Group 10 should contain 4-5% of women. It is 3.58% in our study and caesarean section rate is 9.19% suggesting less of preterm labour caesarean section rate though it is a tertiary hospital.
9. In column 4 Group 1, the caesarean section rate should be less than 10%. In our study it is 12.93% suggesting slightly high caesarean section rate in Group 1.
In column 4 of Group 3 the caesarean section rate should be no more than 3%. But in our study the caesarean section rate is 12.97% suggesting poor data collection or previous caesarean sections being included. Subdivision of this Group is essential to improve the data collection.
In Group 5 the Caesarean section rate should be 50-60%, but in our study it is 97.43%, suggesting subdividing women in this group to two previous sections.
In Group 8 the caesarean section rate should be 60%, but in our study it is 23.46%.
10. In column 5, Group 1, 2 and 5 normally contribute to two thirds of overall caesarean section rates. It contributes to 69.74% in our study slightly more.

4.2 Clinical analysis of each group according to Current Progress in Obstetrics & Gynaecology Vol-2 John Studd,

Group 1 – is the gold standard of any labour unit. In our study the relative size of this group is 39.01% which is large and caesarean section rate is also more in this group – 12.93%. The reason for increased size of the group other than aberration in data collection is the referral system in our hospital. Proper labour management is necessary to reduce the CS rate in this group. Achieving a good uterine contraction, proper usage of oxytocin drip, use of partogram and proper dystocia treatment, foetal monitoring in the labour unit will reduce the caesarean section rate in this group.

Group 2 – the CS rate is 30% which is corresponding. The size of combination of Group 1 and 2 is 53.73% being more.

Group 3 – Caesarean section rate in this group should be less than 3%. It should be similar in every labour unit. In our study it is 12.99% indicating high CS rate probably due to inappropriate data collection.

Group 4 – Caesarean section rate should be 5-8%. Our study corresponds to this being 38.68%. This indicates high pre labour caesarean section in this group. This may be due to our hospital being referral hospital and that women with repeated pregnancy loss with no live baby would be referred here or may be due to inappropriate data collection like in group 3.

Group 5 – relative size is 8.48% which is less than 10% suggesting previous low CS rate. This group contributes highest CS rate in the study period.

Group 6 – CS rate is 72.4% though contribution to overall CS rate is small, being 1.05%. However risk benefit ratio is very different.

Group 7 – CS rate is less than Group 6, as the incidence of breech is more in primis.

Group 8 – It is a heterogeneous group, contributing less to the overall CS rate, has a significantly high perinatal mortality rate. Hence the subdivisions of chorionicity and other factors is of help. Relative size is 0.53 and rate is 0.12%.

Group 9 – relative size should be 0.4-0.8%. In our study it is 0.22% and the caesarean section rate is 100% contributing to the overall rate is low but important in assessing the quality of data collection.

Group 10 – caesarean section rate in this group is 9.19% in our study. Up to 10% is normal. Suggest less of caesarean section rate in pre term section. This is the reason given in tertiary hospital for high Caesarean section rate. This is very rarely the case when data is analyzed.

4.3 Summary

1. Overall Caesarean section rate is 25.8%, higher than WHO standard but less, compared to Asian countries.
2. CS rate in Group 1 is marginally raised.
3. Relative size of Group 1 plus 2 was 53.73%, more than the expected 42%. This may be due to referral system of our hospital or aberration in the data collection.
4. Ratio of relative size Group 1 to Group 2 in column 3 is not less than 2:1, Indicates less induction and less prelabour CS in nulliparous women.
5. Group 3 and 4 CS rate was much higher than the stipulated rate, probably due to improper data collection and high pre labour CS rate in multiparous women in our hospital. Sub dividing these groups according to indication might help in finding out the exact reason for increase CS rate.
6. Group 5 had 97.43% CS rate. This group needs subdivision indicating the reason for caesarean section.
7. Relative size of Group 5 is 8.7%. CS rate below 10% suggests low CS rates in previous years in the Institution.
8. Relative size of Group 6 & 7 is less than 4% suggesting low premature labour CS rates. This is confirmed by relative size of group 10 which is less also than 4%.
9. Relative size of Group 9 is 0.22% and CS rate is 100% suggesting good data collection.

V. Conclusion

Good information collection is important in maintaining the quality standard. Robson's classification is easy in collecting information about caesarean section rate. It gives more information about delivery unit. Sensitization amongst staff in delivery units will go a long way in collecting relevant information about classification. Sub classification of Group 3, 4 and 5 will give reasons to the raised CS rates in these Groups in our Institution.

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