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Original Research Article

Analysis of caesarean-section rates according to Robson's ten group classification system and evaluating the indications within the groups

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ABSTRACT

Background: With Caesarean sections on the rise WHO proposes that health care facilities use the Robson's 10 group classification system to audit their C-sections rates. This classification would help understand the internal structure of the CS rates at individual health facilities identify key population groups, indications in each group and formulate strategies to reduce these rates.

Methods: This was a cross sectional study for a period of 24 months at a tertiary care hospital in a tribal area of Kerala South India. Women who delivered during this period were included and classified into 10 Robson's classes and percentages were calculated for the overall rate, the representation of groups, contribution of groups and Caesarean percentage in each group.

Results: Highest contribution was by Group 5 and Group 2. Together these two groups contributed to 38% of the total Caesareans. Followed by Group 8 and 10. All four added contributed to 63% of the section rate The least contribution was by Group 3. Groups 6, 7 and 9 by themselves did not contribute much but within their groups had a 100% C-Section rate.

Conclusions: The contribution of the various Robson's Group to the absolute C-Section rates needs to be looked into. Reducing primary section rates, adequate counselling and encouraging for VBAC, changing the norms for dystocia and non-reassuring fetal status, training and encouraging obstetricians to perform versions when not contraindicated could reduce the contribution of Robson's groups towards the absolute C-Section rates.

Keywords: C-section, HDI, Robson's classification

INTRODUCTION

It is a well-established that caesarean section (CS) rates have risen in both developed and developing world over the past three decades.¹⁻³ Developed countries like the United States have seen a drastic rise in C- Sections from 1996 to-2011.⁴ The developing world too has seen a similar rise. Countries in south east Asia and sub Saharan Africa have recorded increases in C-Section rates though they vary widely from one country to the other.^{5,6} In India the average C- Section rate till 2006 stands at 8% as per the World Health Organization (WHO). This is an increase over the rates recorded in 1992 (2.4%) and subsequently 1996 (6.8%).⁷ But this national rate of 8% can well mask the differences within the country and

national data after 2006 is not available India has substantial variations in the availability, quality and acceptability of health care facilities including maternal health. Tertiary care centres have high C-Section rates but areas where health care facilities are not available may have maternal deaths due to lack of C-Section facilities.⁸⁻¹⁰

It would therefore be prudent to assess caesarean section rates in tertiary health care facilities which could in some ways be representative of the C-section rates of the population which is catered to by that centre.

Also each of these centres as proposed by WHO should use the Robson's 10 group classification system to audit

their C-Sections rates. This classification would help understand the internal structure of these rates at individual health facilities and specific population groups.¹¹⁻¹³

Identifying the indications that lead to each group's contribution to the section rates would help in formulating guidelines to reduce rates. Within groups without compromising maternal and fetal welfare In 2015, the WHO issued an official statement concerning CS rates and promoting the use of the Robson classification as a tool for optimizing the CS rate at health care facilities.¹⁴ With this in mind we framed the following objectives for our study

Aims and objectives

- To classify our population into the 10 Robson's groups
- To identify which among these groups have the highest C-Section rates
- To formulate plans of reducing these rates

METHODS

Approval was obtained from the Institutional Review Board (IRB). This was a cross sectional study was conducted for a period of 24 months from December 2014 to November 2016 at DM Wayanad Institute of Medical Sciences, a tertiary care hospital in a tribal area of the state of Kerala in South India. All the women delivered during this period whether booked or unbooked were included. All relevant information (see below) which would help to classify the women according to the Robson's 10 classes were entered into an excel chart on a

monthly basis Results were calculated at the end of 24 months.

Percentages were calculated for the overall rate, the representation of the group's contribution of each group to the overall rate and percentage in each group.

There are two classifications one is the original Robson's and the other is its modified version.

We used the original Robson's classification which goes as follows:

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).

RESULTS

The total number of women who delivered were 1624. There were 1640 live births as 16 were twins. The total numbers of C-Sections were 474 and the overall C-Section rate for this period of time at our hospital was 28.90 (Table 1).

Table 1: Description of the Robson's groups in our population.

| Robson's group | Total no in group | Relative size (%) | C-Section rate (%) | CS/ all live births % |
|----------------|---|-------------------|--|-----------------------|
| 1 | 360 | 22.16 | 6.94 (25 sections) | 1.52 |
| 2 | 180 | 11.08 | 45 (81 sections) | 4.93 |
| 3 | 620 | 38.17 | 1.93 (12 sections) | 0.73 |
| 4 | 80 | 4.92 | 27.5 (22 sections) | 1.34 |
| 5 | 160 | 9.85 | 85 (136 sections) | 8.29 |
| 6 | 40 | 2.46 | 100 (40 sections) | 2.43 |
| 7 | 20 | 1.23 | 100 (20) | 1.21 |
| 8 | 120 Live births are 120+16=136 (16 twin deliveries) | 7.38 | 54.58 (62) 62 sections lead to 78 live births so rate is 62 divided by 136 | 3.78 |
| 9 | 20 | 1.23 | 100 (20) | 1.21 |
| 10 | 24 | 1.477 | 25 (56 section) | 3.41 |
| Total | 1640 | | 474 sections | 28.9 |

We calculated CS rates separately for booked and un-booked cases.

Booked cases were defined as having had three antenatal check-ups with us as defined by the Ministry of Health and Family Welfare of India guidelines.¹⁵ The C-Section rate for un-booked cases was 36.3% (227 sections out of 624 live births) and that of booked cases was 24.3% (247 out of 1016 live births) (Table 2).

Table 2: Section rates in booked and un-booked cases.

| | Total number of live births | C-sections | Percentage |
|------------------|-----------------------------|------------|------------|
| Booked cases | 1016 | 247 | 24.3 |
| Unbooked cases - | 624 | 227 | 36.3 |

Robson's Group 3 had the greatest representation in our population followed by Group 1 and 2. Groups 7 and 9 had the least representation (Table 1).

Contribution to the total section rates was highest by Group 5 followed by Group 2. Together these two groups contributed to 38% of the total Cesareans Then came group 8 and 10. When all four groups were added they contributed to 63% of the section rate. The least contribution was by Group 3 (Table 1).

Percentage wise groups 6, 7 and 9 had the greatest section rates all had 100% section rates meaning all women in these three groups underwent CS. Followed by group 5 and 8 which had 85% and 54% respectively (Table 1).

DISCUSSION

Overall section rates

Our overall C-Section is 29.8 %. WHO proposes that at a population level caesarean section rates higher than 10% are not associated with reductions in maternal and newborn mortality rates. Our higher rates reflect the hospital section rate and not the population section rate. Ours is the biggest referral centre in the Wayanad District and receives several referrals from centres not well equipped. To be truly representative of the population section rate we have to include the live births in all other hospitals in this district When compared to other countries our rates were lower than those of the USA (31.1%) and Australia (30%), higher than that of Norway (13.9%) and almost same as that of the Asian countries (27.3%).¹⁶⁻²⁰ However our rates should not be equated with the national rate as recent data about Indian C-Section rates are not available.

Section rates for un-booked cases were higher than the booked cases which could be explained by last minute

referrals, unavailability of section and transfusion facilities at the primary booking centre or other logistics.

For further comparisons we have used a study published in the Lancet in 2012.²¹ This study has reported deliveries in 287 facilities in 21 countries that were included in both the WHO Global Survey of Maternal and Perinatal Health (WHOGS; 2004-08) and the WHO Multi-Country Survey of Maternal and Newborn Health (WHOMCS; 2010-11). Using this data countries were stratified according to Human Development Index (HDI) groups (very high/high, medium, or low) and the Robson criteria were applied to both datasets. The relative size of each Robson group, the caesarean section rate in each Robson group, and the absolute and relative contributions made by each to the overall caesarean section rate was reported.

Representation of the Robson's groups

In our population Group 3 had the greatest representation followed by Groups 1 and 2. We compared this representation with other countries categorized based on Human Development Index which also showed the same trend. India is categorised under Medium HDI.

Group 5 has the greatest absolute contribution to the C-Section rates in our study and this was echoed in the Lancet article where all three HDI category countries were compared and group 5 was found to have the largest contribution. However the next greatest contribution to the absolute C-section rate was by Group 2 in our study whereas the Lancet study uniformly finds the group 1 to be the next greatest contributor irrespective of the HDI status of the country.

Analysis of the indications for C-section in these two groups

In Group 5 out of 160 in this group 136 underwent C-Section. 102 women were fit for and were offered VBAC 33 accepted and rest chose elective section without going into labor. On asking the reason we got answers as "afraid prior stitches might open up", "one has been done so why not two", "can do ligation simultaneously". It appears that with this group counselling and preparedness for VBAC may be the means to decrease section rates. Of the ones that agreed for VBAC non progress and non-reassuring fetal status were the chief indications for section.

In Group 2 again the chief indications for C-Section were non progress and non-reassuring fetal status.

It would be therefore be prudent to address these two most important indications contributing to high C-Section rates in both these groups In this context it would be good to follow the guidelines (March 2014) developed jointly by the American college of Obstetrics and Gynaecologists and the Society for Foetal and Maternal Medicine for safe reduction of caesarean section rates.²²

Remedial measures suggested reducing rates

For dystocia

- a) Consider the threshold of 6cm (not 4cm as earlier) dilatation as the beginning of the active phase.
- b) Latent phase could be prolonged beyond 20 hours in primi-para (earlier 12) and 14 hours (earlier 8) in a multi-para.
- c) Consider arrest only if no progress after 4 hours of adequate uterine contractions or 6 hrs with oxytocin infusion.
- d) Do not apply rules of progress of labour before 6cm dilatation.
- e) In second stage Allow for pushing for two hours in multipara and three hours in primipara.
- f) Rotate occiput manually.
- g) Try instrumental delivery.

For non-reassuring foetal status

- a) Improve the documentation of the non-reassuring status.
- b) Categorize foetal heart rate tracing whereby Category I is normal, Category III which is ominous requiring immediate delivery and the rest as Category II. -For Category II try, as well as.
- c) Document resuscitative measure like maternal repositioning, oxygen supplementation and scalp stimulation to illicit acceleration.

Group 1 in our study had a considerably lesser contribution to the absolute C-Section rates which is of great importance in reducing primary section rates and should be maintained or even improved.

Groups 6, 7 and 9 had lesser representation but a 100% C-Section rates. These three groups mainly represented the mal presentations and this part could have been reduced by versions. Both primi and multi particularly those with un-scarred uterus could undergo versions and stabilizing inductions. Also breech delivery in multis could be promoted.

CONCLUSION

Even though the overall CS rate in the study is not high as compared to international studies, the contribution of the various Robson's Group to the absolute C-Section rates needs to be looked into. Reducing primary section rates, adequate counselling and encouraging for VBAC, changing the norms for dystocia and non-reassuring fetal status, training and encouraging obstetricians to perform versions when not contraindicated could reduce the contribution of Robson's groups towards the absolute C-Section rates. More studies using this classification could further help obstetricians and hospitals formulate strategies to reduce their section rates till they reach the proposed WHO recommendations.

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