Analysis of rates of caesarean section using Robson's 10-group classification in a tertiary care hospital

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Abstract

Background: The most commonly performed surgery in obstetrics is caesarean section. In view of the increasing rate of Caesarean section which is a public health concern WHO proposed the Robson's 10-Group classification for assessing Caesarean section rates at individual health facilities and to formulate strategies to reduce Caesarean section rates. The present study was conducted to analyse the rates of Caesarean sections in a tertiary care hospital using Robson's 10-Group classification system and to identify the specific group of women to be targeted to reduce the caesarean section rate. Materials and methods: This was a retrospective study conducted over a period of 1 year from 1st January 2018 to 31st December 2018 at the OBGY Department, DY Patil Hospital. The delivered women were classified using Robson's 10 Group classification. The proportion of women delivering in each group, CS rate in each group and the relative contribution of each group to overall caesarean section was calculated. Results: A total of 2194 women delivered during the study period out of which 1013 women were delivered by Caesarean section. Caesarean section rate in this study was 46.2%. Primigravida group was the larger group that contributed to 38.9% of total deliveries. Major contributors to overall CS rate were Group 5 at 38.2% followed by Group 2 and 1 at 21.4 % and 13.3% respectively. Totally these three Groups contributed to 72.9% of the overall CS rate while the other Groups contributed to 27.1% of total CS rate. Conclusion: Robson's 10 Group classification is helpful to classify pregnant women and identify the category of women most likely to have CS. Reduction of primary CS rate and increase of VBAC rates will help to decrease the CS rate. Key Word: Caesarean Section, Term pregnancy, Indication of CS, Induction, Robson's 10 Group Classification.

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INTRODUCTION

Caesarean Section is an important surgery to save the life of the pregnant woman and the foetus. Caesarean section rate has steadily increased in India in the last few years. As reported by an Indian Council of Medical Research (ICMR)task force study, the CS rate has increased from 21.8% in 1993-94 to 28.1% in 2005-2006^{1,2}. The increase in the CS rate could be due to rising maternal age, widespread use of electronic foetal monitoring, breech delivery by Caesarean to avoid foetal injury, decrease in

the frequency of forceps, vacuum deliveries, increase in induction of labour, obesity, pre-eclampsia, decrease in VBAC rate, increase in elective caesarean deliveries for medically indicated per-term birth, reduction of foetal injury risk, pelvic floor injury associated with vaginal birth and for maternal request. More than 85% of these operations are performed for four reasons - prior caesarean delivery, dystocia, foetal jeopardy or abnormal foetal presentation³ According to the World Health Organization (WHO)the caesarean section rate should range between 5-15% and no additional benefit would be gained to the mother or the neonates when the rate exceeds 15%^{4,5}. Caesarean section may be associated with short term risks like bleeding, postoperative infections, injury to urogenital and gastrointestinal organs, deep vein thrombosis and long term risks like severe bleeding following abnormal placental complications like Placenta praevia and placenta accreta in subsequent pregnancies[6,7,8]. Increasing rate of CS has become a public health concern. For this WHO in 2011conducted a systematic review of systems and

How to cite this article: Sudha Rani Gandi, Babita Vaswani, Sriram Gopal. Analysis of rates of caesarean section using Robson's 10group classification in a tertiary care hospital. *MedPulse International Journal of Gynaecology*. May 2019; 10(2): 87-90. http://medpulse.in/Gynaecology/index.php concluded that Robson's 10 Group classification is the most appropriate system to classify Caesarean section.^{4,9} which was first proposed by Dr Michael Robson in 2001. The system classifies all women into one of 10 categories that are mutually exclusive and as a set totally comprehensive. The categories are based on five basic obstetrics characteristics that are routinely collected in all maternity hospitals which are as follows:

• Parity (nulliparous, multiparous with and without previous caesarean section)

- Gestational age (term or preterm)
- Foetal presentation (cephalic, breech or transverse)
- Number of foetuses (single or multiple)
- Onset of labour (spontaneous, induced or prelabour caesarean section)

Using the above characteristics all the delivered women are divided into ten groups(Table 1)

Number of the group	Robson's 10-Group classification				
1	Nulliparous, single cephalic, >37 weeks in spontaneous labour				
2	Nulliparous, single cephalic, >37 weeks induced or CS before labour				
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labour				
4	Multiparous (excluding previous CS), single cephalic, >37 weeks induced or CS before labour				
5	Previous CS, single cephalic, >37 weeks				
6	All nulliparous breech (including previous CS)				
7	All multiparous breech (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)				

Table 1. Debcon/s 10 Croup classification

This classification allows comparison and analysis of Caesarean section rates within and across these groups. WHO expects that this classification will help healthcare facilities to optimise the use of Caesarean sections by identifying, analysing and focussing intervention on specific groups^{4,9}. The aim of the study was to classify the deliveries in our institution according to Robson's 10 group classification and analyse the CS rate in various groups. This would help us to identify the specific groups of women to be targeted to reduce CS rates.

MATERIALS AND METHODS

This was a retrospective study conducted in the Department of Obstetrics and Gynaecology at DY Patil Hospital. All the women who delivered during a period of one year from Jan 2018 to Dec 2018 were included in the study. The data was collected from the institutional

medical and delivery records. A case report form was used to collect the data (Age of the patient, parity, mode of previous deliveries, previous caesarean section and indications, gestational age, onset of labour, spontaneous or induced labour). The delivered women were classified according to Robson's 10-Group classification and proportion of women delivering in each group, caesarean section rate in each group, contribution of each group to the overall caesarean section rate were calculated.

OBSERVATIONS AND RESULTS

A total of 2196 women delivered during the period of the study out of which 1013 women had caesarean section. The overall caesarean section rate during this study period was 46.17%.

Number of group	Robson's 10-Group classification	Size of each group	% of each group
1	Nulliparous, single cephalic, >37 weeks in spontaneous labour	460	20.96
2	Nulliparous, single cephalic, >37 weeks induced or CS before labour	394	17.95
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labour	393	17.9
4	Multiparous (excluding previous CS), single cephalic, >37 weeks induced or CS before labour	213	9.7
5	Previous CS, single cephalic, >37 weeks	403	18.3
6	All nulliparous breech (including previous CS)	38	1.73
7	All multiparous breech (including previous CS)	36	1.64
8	All multiple pregnancies (including previous CS)	42	1.91
9	All abnormal lies (including previous CS)	04	0.18
10	All single cephalic <37 weeks (including previous CS)	211	9.61
		2194	100%

Table 2: Distribution and proportion of women in each group according to Robson's 10 Group classification

When they were categorized according to Robson's classification, Groups 1 and 2 contributed to 38.9% of and Groups 3and4 contributed to 27.6% of all deliveries. The women in Group 5 contributed to 18.3% of all deliveries. All the other Groups contributed to 15.07% of all deliveries. The contribution of various groups to the caesarean section rate is given in table 3:

Number of the group	Robson's 10-Group classification	No of CS	No of women in each group	CS rate in each group (No of CS /No of women in each group)	Relative contribution of each group to overall CS rate
1	Nulliparous, single cephalic, >37 weeks in spontaneous labour	135	460	29.3	13.3%
2	Nulliparous, single cephalic, >37 weeks induced or CS before labour	217	394	55.1	21.42%
3	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labour	26	393	6.6	2.56%
4	Multiparous (excluding previous CS), single cephalic, >37 weeks induced or CS before labour	55	213	25.8	5.42%
5	Previous, single cephalic, >37 weeks	387	403	96.0	38.2%
6	All nulliparous breech	35	38	92.1	3.45%
7	All multiparous breech (including previous CS)	34	36	94.4	3.35%
8	All multiple pregnancies (including previous CS)	31	42	73.8	3.06%
9	All abnormal lies (including previous CS)	4	4	100	0.39%
10	All single cephalic <36 weeks (including previous CS)	89	211	42.2	8.78%
		1013	2194		100%

Table 3: CS rates among women groups according to Robson's 10-Group classification.

Maximum contribution to overall section rate was from Group 5 with relative contribution of 38.2% and CS rate of 96.02%. This was followed by Group 2 with relative contribution of 21.42% and CS rate of 55.01%. The third contributor to CS rate was from nulliparous Group 1 with relative contribution of 13.3% and CS rate of 29.3%. Both CS rate and relative contribution to overall CS rate was more in Group 2 when compared to Group 1. In multiparous Group, CS rate was lower in Group 3 (6.6%) when compared to Group 4(25.8%). Relative contribution from Groups 3 and 4 to overall caesarean section rate was 2.56% and 5.42% respectively. All the other Groups contributed to 15.07% of all deliveries and 19.03% of overall CS rate. Among the other Groups - 6,7,8 and 9 although CS rate was high (92.1%, 94.4%, 73.8% and 100% respectively), the relative contribution of all these groups to overall caesarean section rate was low (3.45%, 3.35%, 3.06% and 0.39% respectively). The CS rate in the Group 10 was 42.2% with relative contribution to overall CS rate being 8.78%.

DISCUSSION

In our study caesarean section rate was 46.17% which is higher than the WHO criteria for optimal care. High rate of the CS can be due to higher referral rate of high risk cases as ours being a tertiary care hospital. Robson's 10-Group classification enabled the identification of the specific group of women to be targeted to reduce the caesarean section rate. The maximum contribution to overall CS rate was from the Group 5 (Previous caesarean section, single cephalic, >37 weeks) at 38.2% which is similar to the studies done by Wanjari SA¹⁰ and Sneha B Dhodapkar et al¹¹ which reported overall contribution to CS rate of group 5 in their studies as 36.2% and 40.1% respectively while the studies done by Koteshwar S et al12 and Gomathy *et al*¹³ reported the contribution of group 5 to overall CS rate as 28.9% and 29.9% respectively. The CS rate in group 5 in our study was 96.2% which is similar to the studies done by Koteshwar S et al^{12} and Gomathy *et al*¹³ that reported CS rate in group 5 as 99.2%and 92.2% respectively while the CS rate reported in the Group5 in Sneha et al study was 89.6%. The high CS rate in the Group 5in this study was due to low VBAC rate of 3.98%. The next major contributor to overall CS rate was Group 1 and 2 (Nulliparous Group) at 34.7% and the CS rate in this Group was 84.3%. On further analysis it was found that those who had spontaneous labour (Group 1) had a lower CS rate of 29.3% when compared to those with induced labour/CS before labour (Group 2) in which CS rate was 55.1%. This is similar to the studies by Sneha B Dhodapkar *et al*¹¹ and Gomathy $etal^{13}$ which reported overall CS rates in Group 1 and 2 as 38.2% and 39.75% respectively along with higher CS rates in Group 2 when compared to Group 1 - 33.5% vs 23.5% and 34.1% vs 23.7% respectively. The CS rate in multiparous Group was 32.4% and it contributed to 7.9% of the overall CS rate. On further analysis, it was again found that CS rate was higher in Group 4 (induced labour or caesarean section before labour) -25.8% when compared to Group 3 (spontaneous labour) - 6.6%. In Groups 6-10,

Caesarean Section rate was high due to unavoidable obstetric indications and they contributed to15.01% of total deliveries and 19.03% of overall CS rate. In our study Group 1, Group 2 and Group 5 contributed to 72.9% of the overall CS rate which is similar to the studies by Koteshwara S et al^{12} and Gomathy et al^{13} which reported 79.7% and 69.65% respectively. Other studies also showed similar high incidence of CS in these Groups. Therefore, by using Robson's classification system we could identify these groups of women which are major contributors to overall CS rate and need to be targeted to reduce the CS rate namely all previous CS group, all nulliparous cephalic term with induction/CS before labour and Nulliparous Cephalic term taken for LSCS in labour. Use of Robson's 10 Group classification allows us to compare specific sub-groups of our obstetric population.

CONCLUSION

Robson's 10-Group classification promotes easy way to collect information about Caesarean Section rates. It helps to identify specific categories of women who need to be targeted to reduce CS rate. Detailed analysis of 10 Groups helps us to detect the causes of increased Caesarean Section rates for each group. The efforts to reduce the overall Caesarean section rate should focus on reducing the primary section rate, increasing VBAC deliveries with appropriate counselling, motivation and monitoring of these women and proper training of obstetricians.

REFERENCES

1. Kambo I, Bedi N, Dhillon BS, Saxena NC. A critical appraisal of caesarean section rates at teaching hospitals in India. Int J Gynecol Obstet.2002;79:151-8

- Dhillon BS, Chandhiok N, Bharti S, Bhatia P, Coyaji KJ, Das MC *et al.* Vaginal birth after caesarean section (VBAC) versus emergency repeat caesarean section at teaching hospitals in India: An ICMR task force study.Int J Reprod Contracept Obstet Gynecol.2014 sep;3(3):592-597
- Caesarean Delivery and Peri partum Hysterectomy, Cunningham, Leveno, Bloom, Spong, Dashe, Hoffman, Casey, Sheffield. Williams Obstetrics,24th Edition, Section 8, 587,588
- 4. WHO statement on caesarean section rates. World Health Organization,2015
- 5. World health Organization, Monitoring Emergency Obstetric Care, A Handbook, Geneva, Switzerland 2009
- Lavender T. Hofmeyr GJ, James P Neilson, Carol Kingdon, Gillian ML Gyte. Caesarean section for non – medical reasons at term. Cochrane database of Syst Rev.2012;3:CD 004660
- 7. Silver RM,*et al.* Maternal morbidity associated with multiple repeat caesarean deliveries. Obstet Gynecol. 2006 Jun;107(6):1226-32.
- 8. Robson MS. Classification of caesarean sections. Foetal and maternal medicine review.2001 feb; 12(1):23-39.
- 9. Torloni MR, Betran AP,Souza JP, Gulmezoglu M, *et al.* Classifications for caesarean section: a systematic review.PLoS One.Jan 2011;6(1):e14566
- Wanjari SA. Rising caesarean section rate: a matter of concern? Int J Reprod, Contracept Obstet Gynecol. 2014 sep;3(3):728 – 731
- 11. Dhodapkar SB *et al.* Analysis of caesarean sections according to Robson's ten group classification system at a tertiary care teaching hospital in south India. Int J of Reprod Contracept Obstet and Gynecol. 2015 Jun; 4(3): 745-749.
- Koteshwara S, Sujatha M. S. Analysis of caesarean section rates using Robson's ten group classification – The first step. Int J Reprod Contracept Obstet Gynecol.2017 Aug; 6(8):3481-3485
- Gomathy E *et al.* Use of the Robson classification to assess Caesarean Section trends in tertiary hospital. Int J Reprod Contracept Obstet Gynecol. 2018 May; 7(5):1796-180.

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