Retrospective Evaluation of Caesarean Section by Robson's Ten Group Classification System (RTGC System) in a Tertiary Care Hospital

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ABSTRACT

BACKGROUND

It is noticed that caesarean section (CS) rates are rising worldwide.(1) Robson, proposed a new classification system, the Robson's Ten-Group Classification System to allow critical analysis according to characteristics of pregnancy. WHO proposes that health care facilities use the Robson's 10 group classification system to audit their C-section rates. The study was done to determine the relative size of each group of RTGC system, the CS rate in each group and percentage of contribution of CS by each group to the overall CS rate.

METHODS

It was a retrospective study conducted at MCH, Kolkata. All the women who delivered between Jan 2016 and Dec 2016 were included. All relevant obstetric parameters were collected from the logbook in the records section and were entered in Microsoft Excel and analysed.

RESULTS

Group 1 was the largest (26.08%) followed by group 3 (23.34%) and 5 (19.04%). Group 10 had the smallest relative size (1.24%). CS rate was highest in group 9 (100%) followed by group 5 (92.8%).This group had the highest (17.66%) contribution to the overall CS rate followed by group 1. (11.5%). The" composite model" revealed: NPOL (Non-Progress of Labour) was the most common indication for CS in group 1. Caesarean section rate was the highest (23.21%) for primary/secondary infertility, elderly primi etc. in group 2. PIH (Pregnancy Induced Hypertension) was the most common indication in group 3, 4, 7 and 8 undergoing CS. Group 5 had highest CS rate for post caesarean pregnancy in labour. Primi breech per se was the most common indication for CS in Group 6. Scar tenderness had the highest CS rate (14.19%) in the group 9 and others (primary and secondary infertility, elderly primigravida, persistent less foetal movement, induction failure) were the most common causes of CS (38.02%) in Group 10.

CONCLUSIONS

RTGC is an internationally accepted classification needed to scientifically study the effects of the rising caesarean section rate. We may reduce primary CS rate by proper antenatal check-up and labour management, external cephalic version in breech or transverse lie and conduction of assisted vaginal breech delivery in indicated cases and VBAC/ TOLAC in suitable cases of post caesarean pregnancy.

KEY WORDS

Caesarean Section, Robson's Classification, RTGC, Retrospective

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BACKGROUND

In recent decades, rising caesarean section (CS) rates have been observed worldwide. According to WHO in 1985 in Brazil, "There is no justification for any region to have a caesarean rate (CS) higher than 10%- 15%.[1] The caesarean section rate continues to increase worldwide exceeding 27%.[2] Actually there is no reduction in perinatal/ maternal mortality and or morbidity if CS rate is greater than 15%. When medically justified, CS can effectively prevent maternal and perinatal morbidity and mortality [(1)]. It was revised in 1994 and 1997 by UNICEF, WHO, and UNFPA stating the proportion of caesarean births should range between 5% and 15%. The rate of CS below 5% seems to be associated with gaps in obstetric care leading to poor health outcome, whereas rates over 15% do not seem to improve either maternal or infant health.[3]

Rise in caesarean section rate is to be assessed for increased quality care for the pregnant women. Four criteria will be used for assessment of maternity care: level of interventions and outcomes, choice, cost and efficiency. The Philosophy is that, it is not the caesarean section rate high or low rather whether it is appropriate or not after considering all the relevant information.[2] Indication based classification informs us "why" caesarean section is being done, while RTGC indicates "who" is being done to caesarean section and" when" (Before/after onset of labour and induction of labour) it is being done.[(3)] RTGC system utilizes five obstetric parameters (These are mutually exclusive but totally inclusive) like parity with/without previous CS, onset of labour either spontaneous or induced, period of gestation, number of foetuses and lie/presentation. The Ten-Group Robson classification has been praised for its simplicity, robustness, reproducibility, and flexibility and has been recommended for both the monitoring rates over time as well as between facilities by both WHO in 2014 and FIGO in 2016.[(4)] The study was conducted to determine relative size (%) of each group of RTGC system, to determine CS rate (%) in each group, to determine percentage of each group contributing to the overall CS rate, to undertake the suitable preventive measures which may reduce the burden of CS rate.

METHODS

This was an retrospective study conducted at MCH, Kolkata. All the women delivered from Jan 2016 to Dec 2016 in the labour ward were included in this study. The Institute of Ethics Committee approved our study in Medical College Hospital, Kolkata. All relevant obstetric parameters(parity, mode of previous delivery, period of gestation, number of pregnancies, presentation or lie, previous C. S and indication, whether C.S done before onset of labour, &onset of labour: whether spontaneous or induced labour) were collected from Logbook, BHT and Register khata at the record section and then were entered on Microsoft excel. Data of all delivered mothers was included in the study. All cases with gynaecological complaints, miscarriage, ectopic, molar pregnancy were excluded from the study.

Data was analysed at the end of the study period. Results obtained were compared with the values obtained in "Current Progress in Obstetrics & Gynecology; John Stud Viol 2 (p151- p161) Table 1" We put three tables in our study. First table informed us about the percentage of the relative size of each group of RTGC system. The second table indicated the CS rate of each group and percentage of C.S rate of each group contributing to the overall CS rate. The third table was composite table of both RTGC system and indication based caesarean section classification. This composite table not only identified the contributors to differences in C.S rate across subgroups but also provided an explanation at the specific reason for performing the CS. Actually, the composite model classified the subgroups by indications only.

Statistical Analysis

The total number of women delivered during study period was 12416, out of which CS deliveries were 6155. Overall CS rate calculated for MCH, Kolkata in this specified time period was 49.57%. We used "Measure of frequency "(Count percent etc.), type of descriptive tests in statistical analysis. We used contingency table and chi square statistics in case of inferential statics.

RESULTS

Table 1 shows relative size of size of each group according to RTGCS. The largest relative size was for group 1(26.08%), then group 3(23.34%) and then group 5 (19.04%).The smallest contribution in respect to relative size was for group 9 (1.24%).(Some % in this table do not add up to 100% because of rounding errors). Table 2 shows the result of CS rate of each group and % of contribution of each group to the overall CS rate. The highest CS rate was found in group 9 (100%), while its contribution to the CS rate was 1.24%. Our study showed CS rate was highest for Group 5 (92.8%) followed by Group6 and 7 i.e. 88.7% and 80.62% respectively. Group 3 had the smallest CS rate (14.74%), while group 3 contributed 3.44% to the overall CS rate. Group 5 had 92.81% CS rate, for it would contribute 17.66% to the overall CS rate. Actually group 5 and group1 made highest contribution to the overall CS rate i.e. 17.66% and 11.5% respectively. Moro ever, group 10, 7, 8, and 9 contributed 1.71%, 1.68%, 1.57% and 1.24% to the overall CS rate respectively. Table 3 describes a composite model and divided each group of RTGC system into subgroups by indication of CS. It indicated "who", & "when" were being done to CS and" why" CS was done in a single table.

Group Number	Robson's Ten Groups Classification	N (Number of Each Group)	Relative Size of each Group % (n X 100/Total No. of Deliveries)
I	Nulliparous, single cephalic, > 37 wks. in spontaneous labour	3238	3238/12416 x 100= 26.08%
II	Nulliparous, single cephalic, > 37 wks., Induced or CS before labour	1406	1406/12416 x 100= 11.32%
III	Multiparous (excluding previous CS),single cephalic, > 37 wks. in spontaneous labour	2897	2897/12416 x 100= 23.34%
IV	Multiparous (excluding previous CS),single cephalic, > 37 wks. induced or CS before labour	819	819/12416 x 100= 6.59%
V	Previous CS, single cephalic, > 37 wks.	2363	2363/12416 x 100= 19.04%s
VI	All nulliparous breech	345	345/12416 x 100= 2.78%
VII	All multiparous breech (including previous CS)	258	258/12416 x 100= 2.08
VIII	All multiple pregnancies (including previous CS)	354	354/12416 x 100= 2.86%
IX	All abnormal lies (including previous CS)	155	155/12416 x 100= 1.24%
X	All single cephalic, < 36 wks. (including previous CS)	581	581/12416 x 100= 4.67%

Table 1. Relative Size of Each Group According to RTGCS

Group Number	Robson's Ten Group Classification	Number of CS in Each Group(x)	Number of Women in Each Group (y)	CS Rate in each Group (x/y x 100)%	Contribution of cs made by Each Group to the Overall CS Rate (x/Total no. of Deliveries x 100) %
I	Nulliparous women with single cephalic>=37 wks. in spontaneous labour	1428	3238	44.1%	11.5%
II	Nulliparous women with single cephalic >= 37 wks. who had labour induced or delivered by C.S before labour	642	1406	45.66%	5.17%
III	Multiparous women without a previous uterine scar with single cephalic >= 37 wks. in spontaneous labour	427	2897	14.74%	3.44%
IV	Multiparous women without a previous uterine scar with single cephalic pregnancy >= 37 wks. who had either labour induced /prelabour C.S	388	819	47.37%	3.12%
V	All multiparous women with at least one previous uterine scar, with a single cephalic pregnancy>= 37 wks.	2193	2363	92.81%	17.66%
VI	All nulliparous women with a single breech pregnancy	306	345	88.70%	2.46%
VII	All multiparous women with a single breech, including previous uterine scar	208	258	80.62%	1.68%
VIII	All women with multiple pregnancies including women with previous uterine scar	195	354	55.08%	1.57%
IX	All women with a single pregnancy with a transverse/oblique lie including women with previous uterine scar	155	155	100%	1.24%
X	All women with a single cephalic pregnancy < 37 wks., including women with previous scar	213	581	36.66%	1.71%

Table 2. Calculation of Continuation of Caesarean Section Rate of Each Group and Contribution made by Each Group to the Overall Caesarean Section Rates

Total no. of delivery- 12416, Total no. of LSCS- 6155, C.S rate-49.57%

RTGC System (Rate of CS in Each Group in %)										
Indications (in %)	**GR 1**	**GR2**	**GR3**	**GR4**	**GR5**	**GR6**	**GR7**	**GR8**	**GR9**	**GR10**
	44.1	45.66	14.74	47.3	92.81	88.7	80.62	55.08	100	36.66
Foetal Distress	5.81	20.56	11.71	20.1	6.43	5.56	-	5.12	7.74	6.1
NPOL	32.14	3.12	14.05	3.09	-	5.23	5.77	6.15	-	1.4
CPD	3.64	21.34	0.47	2.32	4.92	6.54	-	-	-	5.16
Obstructed labour	4.76	0.93	9.38	-	28.82.	3.26	6.33	4.61	13.54	9.39
PIH	19.46	19.47	33.49	34.28	10.9	9.15	23.08	24.61	10.96	11.73
Abruptio Placentae	13.44	1.25	5.85	3.09	4.83	6.86	1.92	2.05	8.38	0.93
Placenta Previa	4.9	2.65	9.84	18.56	6.2	8.5	6.81	4.1	9.03	2.82
Others	9.52	23.21	10.77	12.88	7.57	7.19	9.61	8.71	8.39	38.02
Oligohydramnios	6.3	7.48	4.45	5.67	5.38	7.84	-	-	7.74	6.57
Scar tenderness	-	-	-	-	12.08	-	21.71	19.48	14.19	11.73
Repeat CS	-	-	-	-	12.86	-	4.88	4.1	7.09	6.1
Twin per se	-	-	-	-	-	-	-	21.02	-	-
Breech/Transverse lie per se	-	-	-	-	-	39.87 Breech	19.89 Breech	-	12.9 Transverse lie	-

Table 3. Composite Model of "RTGC" and Indication Based Classification: "Who" and "Why" They Underwent CS.

NPOL: Non-progress of labour; GR: group. CPD: Cephalopelvic Disproportion, Others: Infertility (primary and secondary), induction failure, elderly primi, persistent less foetal movement.

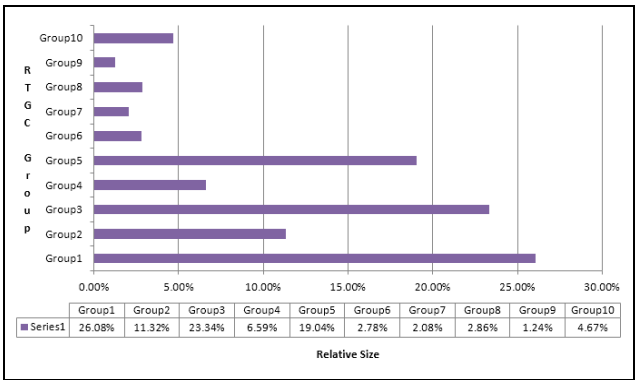

Table 1. Relative Size of Group

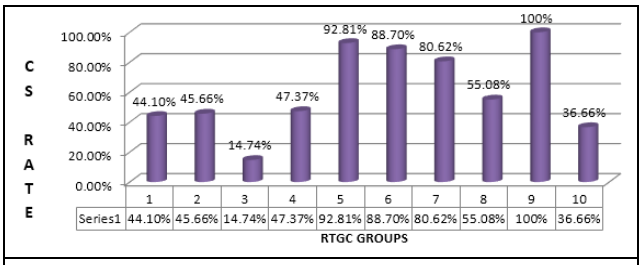

Table 3. Robson's

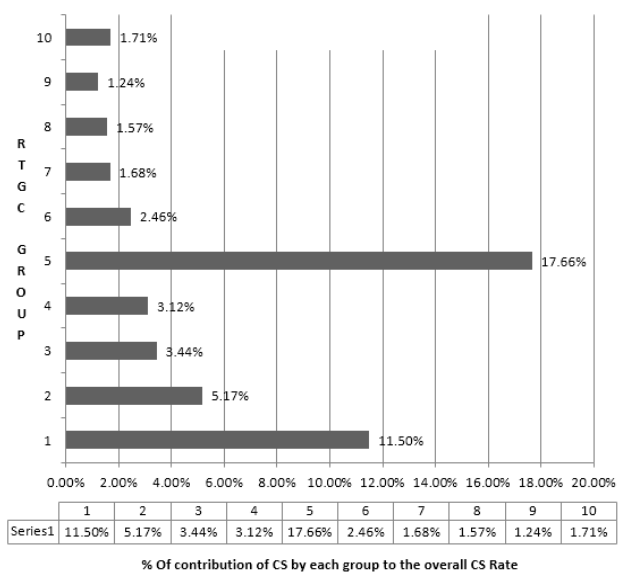

Table 4. Robson's

DISCUSSION

In the present study (From table 1 &2), the overall CS rate is 49.57% which was greater than 15% (WHO 1985) and 27.3% (Asian Country[5] and also greater than 31.2% (International CS Rate.[6]). J. Anuradha et al in the study[7] showed that CS

rate was 46.6% in KGH Hospital, a tertiary care hospital at Vishakhapatnam from Jan 2015 to Jun 2015- the rate was similar to our study. It can be explained by the fact that a tertiary care hospital received a large number of high-risk emergency cases with inadequate or no antenatal care. Most of them were brought late in labour after being handled by untrained persons. Now a day's early detection by partogram, CTG increases the CS rate.

In our study, the relative size was largest for Group 1 26.08% just like R. C. Pramela et al study[2] 39% and Sneha Badwe et al[8] study 33.3%. Our study showed CS rate was highest for Group 5 (92.8%) followed by Group 6 and 7 i.e. 88.7% and 80.62% respectively. This result exactly corresponded with the study done by Punit Hans et al[3] where CS rate were 92% for Group 5, 79.4% for Group 6 and 58.3% for Group 7. In almost all study Group 5 had contributed highest to the overall CS rate. Group 5 was responsible for 17.66% to the overall CS rate (Highest Contribution), almost similar with the study done by Punit Hans et al[3] where it was 14.8%.

Clinical Analysis of Each Group according to Current Progress in Obstetrics and Gynaecology-Vol [2] of John Studd Page 151- 161 (Table 1 & 2)

Group 1: In our study the relative size of this group was 26.08% which was large and CS rate was 44.1%. The reason for increased size of this group was either aberration in data collection or referral system in our hospital.

Group 2: The relative size of combination of group 1 and group 2 was 37.4%, which is accepted (35%- 42%) The CS rate was 45.66% in group 2 (expected up to 30%). So here, increased CS rate was due to increased prelabour CS relative to the number of inductions.

Group 3: Ideal CS rate in this group is < 3%. In our study the CS rate in this group was 14.74% either due to poor data collection or inappropriate classification (women with previous scar were wrongly placed in this group).

Group 4: The CS rate in this group should be between 5% - 8%. But our study showed 47.37% CS rate in this group. This was due to greater prelabour CS, increased number of referred women with repeated pregnancy loss with or without live baby as well as poor data collection and misclassification.

Group 5: The relative size of this group is 19.04% which is greater (expected 10%) suggesting high primary CS rate. The CS rate is also higher (92.8%) than expected (50%-60%).It contributed the highest percentage to the overall CS rate (17.66%).

Group 6: The relative size of this group is 2.78%. The CS rate is 88.7%., as most nulliparous breech is delivered now by CS.

Group 7: The relative size is 2.08% less than Group-6. CS rate is 80.62%, less compared to group 6 as the incidence of breech is more common in primigravida.

Group 8: the relative size of this group is 2.86% (expected 1.5%-2%) more or less equal to group 6 and 7. Ideally it should be less than group 6 or 7, which may be due to inappropriate data collection.

Group 9: The relative size should be. 4% -.8%. This group had relative size of 1.24% in our study, which was a little bit higher. The CS rate in this group was 100% which corresponds with almost all studies.

Group 10: Relative size usually should be 4% - 5%, may be higher in tertiary referral unit up to 10%. Our study showed relative size 4.67%, which corresponds. The CS rate was 36.66%. It indicates a significant portion of preterm delivery by CS is due to foetal and maternal conditions rather than spontaneous preterm labour. (<30% indicates greater number of spontaneous preterm labour and > 30% indicates preterm delivery by CS due to maternal and or foetal reasons).

Composite Model I.e. Combination of Both Indication Based Classification and RTGC System (Table 3)

Group 1: Nonprogress of labour (NPOL) was the most common indication of caesarean section (32.14%) in this group". Proper labour management is mandatory to reduce the high CS rate. We need to describe the criteria for diagnosis of labour, diagnosis and treatment of dystocia by partogram and oxytocin regimen as well as CTG monitoring for reduction of CS rate. Cervical dilatation of 6 cm. should be the threshold of active phase of labour. Augmentation of labour should be done after 6 cm dilatation of cervix to reduce the incidence of foetal distress, nonprogress of labour etc. CS should be avoided in case of prolonged latent phase of labour. Instrumental vaginal delivery is another way to reduce the CS rate (5). Increased CS rate in group 1 is the main responsible factor for increasing primary CS rate.

Group 2: CS rate was highest for primary or secondary infertility, induction failure, elderly prim and persistent less foetal movement. We may reduce the CS rate by induction of labour in proper cases after thorough assessment of pelvis and Bishop's scoring, and persistent less foetal movement should be confirmed by CTG or USG as per requirement.

Group 3: The most common indication for caesarean section was (PIH) pregnancy induced hypertensive disorders (33.49%).Proper antenatal check-up will lower the burden of CS rate.

Group 4: Here also the most common indication of CS was PIH. Again, proper antenatal care will definitely come down the CS rate.

Group 5: the most common indication for CS is post CS in labour(28.82%) followed by repeat CS (12.86%) and scar tenderness (12.08%).Patients with post CS in labour were mostly referral cases in higher number. So VBAC trial was not possible for most of them, either due to large number of referral or the cases were not suitable for VBAC.

Group 6: Primi breech per se (39.87%) was the most common indication of caesarean section in the group. CS rate can be reduced by external cephalic version at 36 weeks, and trial for assisted vaginal breech delivery in suitable cases.[4,9]

Group 7: PIH (23.08%) was the most common indication of CS in this group. Proper antenatal check-up and management reduces the rate of CS

Group 8: PIH was the most important indication of CS. We need proper and adequate antenatal check-up, management for the patient.

Group 9: Scar tenderness in post CS pregnancy in this group had the CS rate of (14.19%). This group has 100% CS rate. We may reduce the primary CS rate which can permit the case for external cephalic version at 36 weeks and therefore CS rate can be reduced.

Group 10: Others like primary or secondary infertility, elderly primigravida, persistent less foetal movement and induction failure cases underwent more caesarean section (CS rate; 38.02%) in this group. Correct use of USG with Doppler flow indices, CTG monitoring and induction in eligible cases after proper assessment of pelvis and Bishop's scoring can minimizes the CS rate.

CONCLUSIONS

There are three systems to study the CS rate: "Indication Based Classification", RTGC system and "Composite Model. Indication based classification is more acceptable to the clinicians. But it lacks proper definition for some clinical conditions leading to CS i.e. dystocia, NPOL and foetal distress. RTGC is an internationally accepted classification that is much needed to scientifically study the effects of the rising caesarean section rate[10] and it is more acceptable to public health persons. It identifies the contributors to differences in caesarean section rates but does not provide any explanation for these differences across subgroups. But "composite model" can provide an explanation for the differences in CS rates across subgroups. Composite model is a symbolic presentation of combined effort of both clinicians and public health persons. If it is applied on a large scale, composite model will be the best among three. From the study, we may conclude that primary CS rate can be reduced by proper antenatal check-up and labour management, induction of labour in indicated cases after proper assessment, instrumental vaginal delivery, external cephalic version in breech or transverse lie and conduction of assisted vaginal breech delivery in indicated cases. We may lower the CS rate in group 5 by proper arrangement of VBAC/ TOLAC in suitable cases.

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