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ASSESSMENT OF CAESAREAN SECTION TRENDS BY USING ROBSON'S TEN GROUP CLASSIFICATION SYSTEM IN A TERTIARY CARE HOSPITAL IN WEST BENGAL, INDIA: A RETROSPECTIVE ANALYSIS

Hasibul Hasan Shirazee [1], Pritilata Show [1], Animesh Naskar [2], Suvasmita Saha [*3] and Monimala Murmu [1]

Department of Gynecology & Obstetrics [1], R. G. Kar Medical College & Hospital, Kolkata - 700004, West Bengal, India.
Department of Gynecology & Obstetrics [2], S. C. C. Government Medical College & Hospital, Uluberia, Howrah - 711316, West Bengal, India.
Department of Gynecology & Obstetrics [3], College of Medicine & JNM Hospital, Kalyani - 741235, West Bengal, India.

ABSTRACT: Introduction: The increasing trends for caesarean section (CS) not only in India but also globally have been a cause of concern. With the aim of comparing and analyzing CS rates worldwide, the WHO suggests Robson's ten group classification system (RTGCS). **Aims and Objectives:** To find the groups of women with high CS rate which will help policymakers to target that specific groups of women for the reduction of overall CS. **Materials and Methods:** This was a retrospective study design using hospital records for women delivered between January 1, 2021 and December 31, 2021. Data were entered and analyzed using Excel and presented in percentages after using RTGCS. **Results:** Out of total 12645 women delivered during the study period, 7180(56.78%) were delivered by CS. The high CS rates were in group 9 (abnormal lie) - 100%, group 6 (breech nulliparous) - 94.73%, group 5 (previous CS) -93.67%. In respect of all CS, the maximum contribution was done by group 5 (31.03%), group 1 (23.90%) and group 10 (20.55%). **Conclusions:** The result indicates that group 5 (previous CS) was the most common indication. Trial of labour after CS should be practiced as a routine. CTG (cardiotocography) should not be used as a tool for monitoring labour patient rather than clinical examination and maintaining partograph for each and every patient who is in active labour should be done in labour room to reduce the Group 1 CS rate.

INTRODUCTION: Lower segment cesarean section (LSCS) is the most common surgery in obstetrics. According to the WHO, cesarean section (CS) delivery should not exceed 10- 15% of all deliveries [1]. However, the worldwide trends suggest that CS rate has risen from 20% to 28% within the past 20 years [2].

India is also facing the same trend which rose to 15.5% in 2015. In some states and private institutes, it is over 30% also [3]. A high CS rate is a crucial public health problem. It not only increases the cost of health services but also results in morbidities and mortalities of the mothers as well as neonates [4, 5].

Hence, it is important to stop the unnecessary CS deliveries. However to achieve this, we need to classify women into various groups by universally acceptable and comparable classification system i.e Robson's Ten Group Classification System (RTGCS). The RTGCS classifies women into 10 categories based on their obstetric characteristics

without needing the indication for CS (2001) [6]. This study was done in R. G. Kar Medical College and Hospital, a tertiary care hospital in Kolkata, which performs more than 10000 deliveries annually with a proportion of surgical deliveries exceeding 30%. This large proportion of CS is mainly because of being a referral hospital for complicated cases from a large catchment area.

Aims and Objectives: The objective of this study was to identify the proportion of caesarean deliveries in mothers classified as per Robson's Ten Group Classification System (TGCS) and to find out the groups having the high CS rates. This will help the policymakers to optimize the policies to decrease the rate of unnecessary CS which ultimately will improve the maternal and child health.

MATERIAL AND METHODS: This was a retrospective study conducted at R. G. Kar Medical College and Hospital, a tertiary care hospital in Kolkata, West Bengal, India during a period of 1 year between 1st January 2021 and 31st December 2021. Ethical clearance was obtained from Institutional Ethical Committee (Memo No-RKC/104, Dated- 12/02/2020).

Sample Size and Inclusion Criteria: During this period, a total of 12645 deliveries were conducted in R. G. Kar Medical College and Hospital, a tertiary care hospital in Kolkata, west Bengal, India. All of them are included in the study so the sample size became 12645.

Exclusion Criteria: Incomplete records or inadequate case details were excluded. As there was no incomplete record or case paper in this study population so there is no exclusion.

Study Tool and Data Collection: Hospital delivery records were used for data collection. All the required informations were collected as per Robson classification.

All the data were entered into Microsoft Excel and women were classified according to Robson's criteria in 10 different groups as below:

GROUP 1 — Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour

GROUP 2 — Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour

GROUP 3 — Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour

GROUP 4 — Multiparous women without a previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation who either had labour induced or were delivered by caesarean section before labour

GROUP 5 — All multiparous women with at least one previous uterine scar, with a single cephalic pregnancy, ≥37 weeks gestation

GROUP 6 — All nulliparous women with a single breech pregnancy

GROUP 7 — All multiparous women with a single breech pregnancy, including women with previous uterine scars

GROUP 8 — All women with multiple pregnancies, including women with previous uterine scars

GROUP 9 — All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars

GROUP 10 — All women with a single cephalic pregnancy <37 weeks gestation, including women with previous scars

Statistical Analysis: All the data were entered into Microsoft Excel. Every group size, absolute CS rates in relation to total deliveries in each group, and relative CS rates in relation to total number of CS were calculated and presented as percentage.

RESULTS: In our study total of 12645 women delivered during the study period and among them 7180 women (56.78%) delivered by Caesarean section and the rest (43.22%) were vaginal delivery **Fig. 1.**

From **Table 1** in this study it has been seen that total population in group 1(26.07%) and group 2(15.36%), which includes nulliparous, singleton, cephalic, ≥37 weeks gestation, in spontaneous labour/ induced labour, or CS before labour was 41.43% followed by group 5(women with previous CS, singleton term pregnancy) and group 10 (preterm singleton pregnancy with cephalic presentation), each consisting of 18.80%.

Group 3 included multiparous women without a previous CS and singleton term pregnancy in spontaneous labour was 9.52% followed by group 4 (5.11%). Total 3.5% were with breech presentation (group 6 and 7), among them nulliparous women (Group 6) were double than the multiparous (Group 7) women. Only 2.61% women had multiple

pregnancies (Group 8) and only 0.23% women had abnormal lies (Group 9).
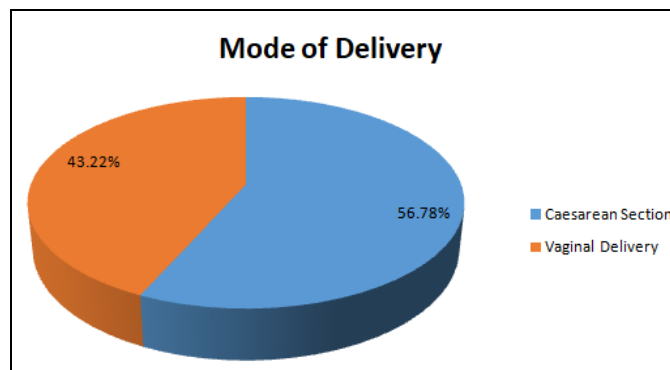
FIG. 1: MODE OF DELIVERY IN STUDY POPULATION (N = 12645)

TABLE 1: DISTRIBUTION OF CASES AS PER ROBSON'S TEN GROUP CLASSIFICATION SYSTEM (RTGCS)

Robson Group	Total Cases (n = 12645)	Percentage
Group 1	3297	26.07%
Group 2	1942	15.36%
Group 3	1204	9.52%
Group 4	647	5.11%
Group 5	2379	18.80%
Group 6	286	2.26%
Group 7	151	1.19%
Group 8	331	2.61%
Group 9	30	0.23%
Group 10	2378	18.80%

TABLE 2: MODE OF DELIVERY IN INDIVIDUAL ROBSON'S TEN CLASSIFICATION GROUPS

Robson Group	Total delivery (n= 12645)	Caesarean section (n= 7180)	Vaginal Delivery (n = 5465)
Group 1	3297	1716(52.05%)	1581(47.95%)
Group 2	1942	632(32.56%)	1310(67.45%)
Group 3	1204	286(23.75%)	918(76.25%)
Group 4	647	150(23.25%)	497(76.81%)
Group 5	2379	2228(93.67%)	151(6.34%)
Group 6	286	271(94.73%)	15(5.25%)
Group 7	151	106(70%)	45(30%)
Group 8	331	286(86.36%)	45(13.60%)
Group 9	30	30(100%)	0
Group 10	2378	1475(62.02%)	903(37.97%)

We have studied the CS rate as compared to normal delivery in each Robson's ten group **Table 2**. All the women (100%) in Group 9 (transverse or oblique lie) were delivered by CS. In Group 6 (nulliparous breech) 94.73% were delivered by CS while in Group 5(previous CS) 93.67% were delivered by CS.

The other groups in descending order of CS rate were Group 8 (86.36%), Group 7 (70%), Group 10 (62.02%), Group 1 (52.05%) and Group 2

(32.56%). In our study CS rate was statistically significant in Group 5 to 10 in comparison to vaginal delivery. Least surgical delivery rate of 23.50% was observed in Group 3 and Group 4 each where the vaginal delivery was significantly more than CS.

In the present study **Fig. 2** showed the comparison of absolute caesarean section rate in different Robson's ten classification groups.
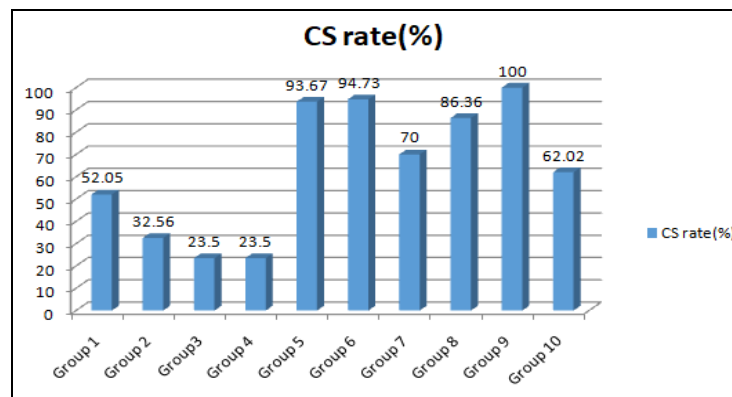
FIG. 2: COMPARISON OF ABSOLUTE CAESAREAN SECTION RATE IN DIFFERENT ROBSON TEN GROUPS

TABLE 3: RELATIVE CAESAREAN SECTION RATES IN DIFFERENT ROBSON GROUPS IN RELATION TO TOTAL NUMBER OF CS

Robson Group	No of CS (n= 7180)	Relative contribution to overall CS rate (%)
Group 1	1716	23.90
Group 2	632	8.80
Group 3	286	3.98
Group 4	150	2.09
Group 5	2228	31.03
Group 6	271	3.77
Group 7	106	1.48
Group 8	286	3.98
Group 9	30	0.42
Group 10	1475	20.54

In our study **Table 3**, we have found the number of women delivered in each group of Robson Ten classification. We also found the number of CS in each group and relative CS rate as compared to overall CS. Total 7180 (56.78%) women delivered by CS out of 12645 deliveries. The highest contribution of total CS are from Group 5 (31.03%), followed by Group 1 (23.90%) and Group 10 (20.54%). No other group contributed more than 9% of total caesarean section.

DISCUSSION: The present study was conducted in the Department of Obstetrics & Gynaecology, R. G. Kar Medical College & Hospital, Kolkata, West Bengal, India which is a tertiary care teaching hospital in West Bengal, India. This study includes the necessary retrospective data from 1st January 2021 to 31st December 2021.

Being a tertiary care centre, a huge number of referrals are made to this institute every year for better management from a large catchment area. The primary reason behind the high rates of caesarean section in this hospital can be attributed to the large proportion of population being referred from suburban areas and peripheral centres even from the district hospitals. Most of them are complicated cases or unbooked cases. Labour wards in this hospital are always flooded with patients, many of them requires constant monitoring and proper decision of delivery at the right time.

Robson Ten Group Classification System (RTGCS) has recently been used to make international comparisons in caesarean section rates. The results of this study suggests that the largest contributor to the overall rates of CS in group 5 followed by group 1 and group 10. This result is comparable to most other studies by Kambo I *et al* 2002)[7], Naidu N *et al* (2009)[8], Singh G *et al* (2013)[9], Preetkamal *et al* (2017)[10] and Khan MA *et al* (2020)[11].

Group 5, women with previous caesarean section and a single cephalic presentation at term is the largest contributor to the overall CS rate (31.03%) in this hospital. This group is the most common indication for caesarean section world wide as per the study by Naidu N *et al*[8]. In the first half of the 20th century, a woman who had a caesarean section was likely also to deliver by caesarean section in subsequent institutional delivery. Similar results were obtained from the study of Khan MA *et al* (2020)[11].

It was found from their study that group 5, group 2, group 10 were the most contributing group to overall CS rate. One common observation in all of these studies has been that the vaginal delivery is feared to impart uterine rupture among the women with previous history of caesarean section. VBAC (vaginal birth after cesarean section) is a practice which should be considered in hospitals like this with CEmONC (Comprehensive Emergency Obstetric And Newborn Care) services. In the context of overall increase in the CS rates, this group 5 needs to be analyzed critically because as caesarean section rates increase in the other groups, group 5 will increase its size and therefore it will become an even more important contribution to the overall caesarean section rate. However, reducing caesarean section in this group is likely to be most difficult because having a previous delivery by CS increases the likelihood of caesarean delivery in the next pregnancy. Therefore, the best way to reduce the overall CS rate in this group is to prevent the first caesarean section.

Group 1, nulliparous women with single cephalic pregnancy at term in spontaneous labour is the second largest contributor to the overall caesarean section rate (23.90%) in this hospital. Study by Dhodapkar SB *et al* [12] has observed that group 1 is the largest contributor followed by group 5 and group 2. A Caesarean Section rate in group 1 less than 10% is desirable. In our study CS rate in group 1 is 23.90% which was in accordance with study done in other parts of India by Shirsath A *et al* [13] and Kansara V *et al* [14] (19.6% and 20.11% respectively).

The third largest contributor to the overall rates of CS is group 10 (20.54%) which includes all women with single cephalic pregnancy carrying <37 weeks of gestation, including women with previous scars. These women mainly presented with premature rupture of membrane, antepartum haemorrhage, scar tenderness in post CS or repeat CS, hypertensive disorder of pregnancy including severe preeclampsia and eclampsia. Also medical comorbidities like diabetes mellitus, chronic hypertension were other common causes. This could be representative of the fact that being a leading tertiary care hospital, most cases might be referred to our facility as high risk cases. In our setup, we found that group 2 also contributes a significant portion of caesarean section, that is (8.80%) which includes all nulliparous women with a single cephalic pregnancy carrying >=37 weeks gestation, who either had labour induced or were delivered by CS before labour, which is definitely a matter of concern. The high CS rates indicate that a considerable proportion of women either had a high incidence of conditions that required labour induction or had elective labour induction and prelabour caesarean section for the same of convenience or other potentially non medical reason.

Clearly this group would need to be investigated in detail to understand the exact reason of the high rate and take appropriate action. By reviewing the indication for ending the pregnancy before spontaneous labour and how labour induction was managed in these women, one could identify gaps in application of evidence based clinical practices and potentially reduce unnecessary caesarean section in this group. On analysis of indications of CS in primigravida group, many of women was delivered by CS following non reassuring cardiotocogram (CTG). According to Bernardes J et al this fraction can be lowered by reducing the inter observer difference in interpretation of CTG by implementing frequent teaching programme for the Obstetric staffs [15].

The overall CS rate in the present study was 56.78% which is higher than that recommended by the WHO (15%) [1]. Our finding is consistent with the studies of Kansara *et al,* 2014 (46.1%) [14], Dhodapkar *et al,* 2015 (40%) [12] and Wanjari SA *et al,* 2014 (32.8%) [16]. To reduce the caesarean section rate in group 5, Trial of labour after caesarean section (TOLAC) is the only available option. However for TOLAC, no specific guidelines are available, so it entirely depends on the subjective decision of the obstetrician and his/her risk taking attitude and varies from centre to centre.

CONCLUSIONS: The Robson Ten Group Classification System (RTGCS) is a simple and standard tool for the classification of CS and to identify the groups that make the significant contribution to the overall caesarean section rates. Our result indicates that group 5 (previous CS) was the most common indication. Trial of labour after

CS should be practiced as a routine to decrease the CS rate. For reduction in the percentage of overall caesarean section rate, Group 1, 2 (when induced) and Group 3,4 (when induced) needs intensive intrapartum monitoring.CTG (cardiotocography) should not be used as a tool for monitoring labour patient rather than clinical examination and maintaining partograph for each and every patient who is in active labour should be done in labour room to reduce the CS rate. Significant rise in Groups 1, 2 and 10 have a direct impact on Group 5. This is a matter of concern as the more the number of unindicated CS has been done, more will be the risks of morbidity and mortality because caesarean section is a major surgical procedure and comes with its own sets of complications.

Analysis of Robson TGCS will help to build strategies which will reduce caesarean section rates wherever appropriate.

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