The Journal of Obstetrics and Gynecology of India (November–December 2023) 73(6):496–503
https://doi.org/10.1007/s13224-023-01851-y

ORIGINAL ARTICLE

Study of Caesarean Section Births in a Tertiary Care Hospital in Mumbai Using Robson Classification System

Hitendrasing Rajput[1] · Pradnya Changede[1] · Niranjan Chavan[1] · Arun Nayak[1] · Shikhanshi[1] · Hera Mirza[1] · Shalini Mahapatra[1]

Received: 28 April 2023 / Accepted: 30 August 2023 / Published online: 10 October 2023

Abstract

Introduction Robson ten-group classification system is recommended by WHO (World health organization) as a global standard for assessment and monitoring caesarean section (CS) rates. This classification is simple and robust. It is prospective, easily reproducible and clinically relevant.

Methodology We conducted a prospective observational study of CS births at a tertiary care institute. Caesarean births in a tertiary care hospital were classified using Robson classification system as recommended by WHO. The study was conducted for period of 6 months duration. The ethics committee of the institute approved this study. We enrolled 4771 consecutive women who delivered during this study period. We included patients who had vaginal delivery as well as those who had delivery by CS. Both live births and stillbirths (of at least 500-g birth weight or at least 22 weeks gestation (according to WHO recommendations) were included in this study.

Results During this study period, we had 4771 deliveries, out of which 2231 pregnant women (46.76%) were delivered by CS as compared to 2540 vaginal deliveries. Women with previous CS (term with single cephalic pregnancy) were included in Robson group 5. Group 5 had the highest CS rate (13.41%). Robson group 5, 1 and 10 were the largest contributors to the high CS rates at our institute.

Conclusion In our study, 4771 deliveries were conducted during this study period (6 months). Out of 4771 deliveries, CS was done in 2231 pregnant women (46.76%). 2540 women had vaginal deliveries. Group 5 (13.41%) which comprised of women with previous CS had the highest CS rate followed by group 1 and group 10. The second largest contribution was from Group 1 with CS rate of 9.01%. Robson Group 1 included nulliparous term women with single cephalic pregnancy in spontaneous labour. Group 10 was the third largest contributor to the overall CS. Group 10 included women who delivered preterm (single cephalic presentation). Group 10 contributed to 8.09% of overall CS rate. We should make every effort to provide CS for women requiring this procedure, rather than work towards achieving a specific rate for CS.

Keywords Robson Ten-group classification system (TGCS) · Caesarean section rate · Caesarean section (CS) births · Audit of caesarean births · Rising trends of caesarean births · Indications of caesarean section

Introduction

Caesarean section is a very common surgical procedure carried out in Obstetrics. Over the recent years, the rate of caesarean sections has been increasing [1]. Absolute indication for caesarean section includes contracted pelvis, malpresentations (transverse lie and brow) and placenta previa. CS delivery poses more risks to the patient as compared to vaginal delivery if we compare these two modes of delivery [1].

Robson ten-group classification system (TGCS) is recommended by WHO (World health organization) as a global standard for assessing and monitoring caesarean section rates

Hitendrasing Rajput (MS (OBGY), MBBS) is a Postgraduate, Pradnya Changede (MS (OBGY), FICOG, FCPS, DGO, MBBS, IBCLC) is a Associate Professor, Niranjan Chavan (MD (OBGY), MICOG, FCPS, DGO, DFP, MBBS) is a Professor and Head of Unit, Arun Nayak (MD (OBGY), FICOG, FAMS, FCPS, DGO, MBBS) is a Professor and Head of Department, Shikhanshi (MS (OBGY), MBBS) is a Postgraduate, Hera Mirza (MS (OBGY), MBBS) is a Postgraduate, Shalini Mahapatra (MS (OBGY), MBBS) is a Postgraduate.

✉ Pradnya Changede
pradnyachangede@gmail.com

[1] Department of OBGY, LTMMC, Mumbai, Maharashtra, India

[2]. CS rates can be compared within healthcare facilities and between them using this classification. Robson classification is simple and robust.

The ten-group Robson classification is simple, robust, reproducible and flexible [3, 4]. Robson classification has been now used to analyze rising trends of caesarean births and factors contributing to this increasing rate. The present study was done at our tertiary care centre to assess the frequency and indications for CS. CS births were analysed using Robson ten group classification. This study would help identify the group which has maximum caesarean section rate and possibly point out measures which can reduce rising CS rate.

Material and Method

This is a prospective observational study of caesarean section births. Caesarean births were analysed using Robson classification system as recommended by WHO. This study was conducted in a tertiary Care Hospital and Medical College for a period of 6 months duration in 2019 (1st July 2019 to 31st December 2019). The ethics committee of our institute approved this study.

- *Design* This was a prospective observational study.
- *Place of Study* Tertiary care hospital in Mumbai.
- *The Study Population* We enrolled 4771 consecutive women who delivered during this study period. We included patients who had vaginal delivery as well as those who had delivery by CS. Both live births and stillbirths (of at least 500-g birth weight or at least 22 weeks gestation (according to WHO recommendation) were included in this study.

Inclusion Criteria

1. All caesarean births (at least 500-g birth weight or at least 22-week gestation delivered during the study period).
2. All vaginal births (at least 500-g birth weight or at least 22-week gestation delivered during the study period).

Exclusion Criteria

1. Clinically diagnosed abdominal pregnancy proved on laparotomy.
2. Clinically diagnosed rupture uterus proved on laparotomy.

Aims and Objectives

Aims

- The aim of this study was to study caesarean section births using Robson classification system in a tertiary care hospital.

Objectives

- To determine the rate of caesarean section in all Robson groups.
- To determine relative size of each Robson group.

All delivered patients were classified into 10 groups using Robson classification as recommended by WHO. Robson Classification with subdivisions is mentioned in Table 1.

Sample size is calculated by following formula:

$$\text{Sample size} = z\alpha 2pq/l2$$

where $z\alpha = 1.96$, corresponding to 95% confidence interval, $\alpha = 0.05$ i.e., the level of significance. p = power of analysis = 80% $q = 1 - p$ i.e., 0.2 l = relative error, here taken as 5%. The total sample size for this study was 240. We enrolled 4771 patients to avoid errors and bias in sample selection.

Results

4771 deliveries were conducted during this study period (6 months). Out of 4771 deliveries, CS was done in 2231 pregnant women (46.76%). 2540 women had vaginal deliveries. The ranking of contribution of CS of each group to total number of deliveries i.e., CS rate in each group is mentioned in Table 2, Fig. 1. Rate of C/S in each group is mentioned in Fig. 2. Ranking according to relative size of each group and rate of caesarean section in each group by Robson classification is stated in Table 3, Fig. 3. Contribution of CS of each group to total number of CS is mentioned in Fig. 4.

Group 5 (13.41%) which comprised of women with previous CS had the highest CS rate followed by group 1 and group 10. The second largest contribution was from group 1 with CS rate of 9.01%. Robson group 1 included nulliparous term women with single cephalic pregnancy in spontaneous labour. Foetal distress, cephalopelvic disproportion and prolonged labour were the three most common reasons for doing CS in this group.

Group 10 was the third largest contributor to the overall CS. Group 10 included women who delivered preterm

Table 1 Robson classification with subdivisions

Group	Obstetric population
1	Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour
2	Nulliparous women with a single cephalic pregnancy, ≥ 37 weeks gestation who had labour induced or were delivered by CS before labour
2a	Labour induced
2b	Pre-labour CS
3	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour
4	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation who had labour induced or were delivered by CS before labour
4a	Labour induced
4b	Pre-labour CS
5	All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥ 37 weeks gestation CS
5.1	With one previous
5.2	With two or more previous CSs
6	All nulliparous women with a single breech pregnancy
7	All multiparous women with a single breech pregnancy including women with previous CS(s)
8	All women with multiple pregnancies including women with previous CS(s)
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)
10	All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

Table 2 The ranking of contribution of CS of each group to total number of deliveries i.e. CS rate in each group (A/total number of deliveries × 100)

Rank	Classification group	Contribution of CS of each group to total number of deliveries i.e., CS rate in each group (A/total number of deliveries × 100) (%)
1	Group 5	13.41
2	Group 1	9.01
3	Group 10	8.09
4	Group 2	4.63
5	Group 3	3.43
6	Group 4	2.01
7	Group 6	1.90
8	Group 7	1.80
9	Group 8	1.80
10	Group 9	0.64

(single cephalic presentation). Group 10 contributed to 8.09% of overall CS rate. Group 2, 3 and 4 had CS rate of 4.63%, 3.43% and 2.01% respectively. Three groups who were the largest contributors to the CS rate were group 5, group 1 and group 10.

We had 230 breech presentations (in both primigravida and multigravida) during this study period. 53 of these breech presentations were delivered vaginally and the remaining were delivered by CS. Group 6 and group 7 thus accounted for 3.7% CS. Group 9 included patients with transverse or oblique lie. This group contributed to 0.64% of total number of deliveries. CS was done for all women in group 9 (transverse lie or oblique lie). The caesarean section rate of this group was 100%. Patients with multifetal gestations were included in group 8. This group contributed to 1.80% of all CS.

Discussion

After analysis of this study by Robson classification we noted that group 5 which included women with previous CS had the highest contribution to the total CS rate. This group contributed to 13.41% of total CS rate. Groups who had significant contribution to the caesarean section rate were Group 1, Group 10 and Group 2 with each contributing to 9.01%, 8.09% and 4.63% CS rate respectively. Women in group 5 women were delivered by CS, mainly due to the

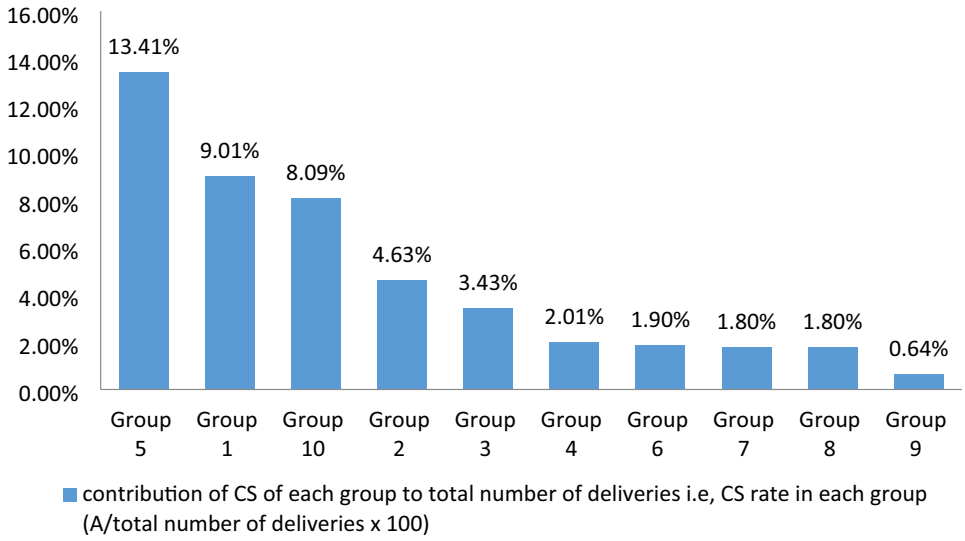

Fig. 1 Contribution of CS of each group to total number of deliveries i.e. CS rate in each group (A/total number of deliveries × 100)

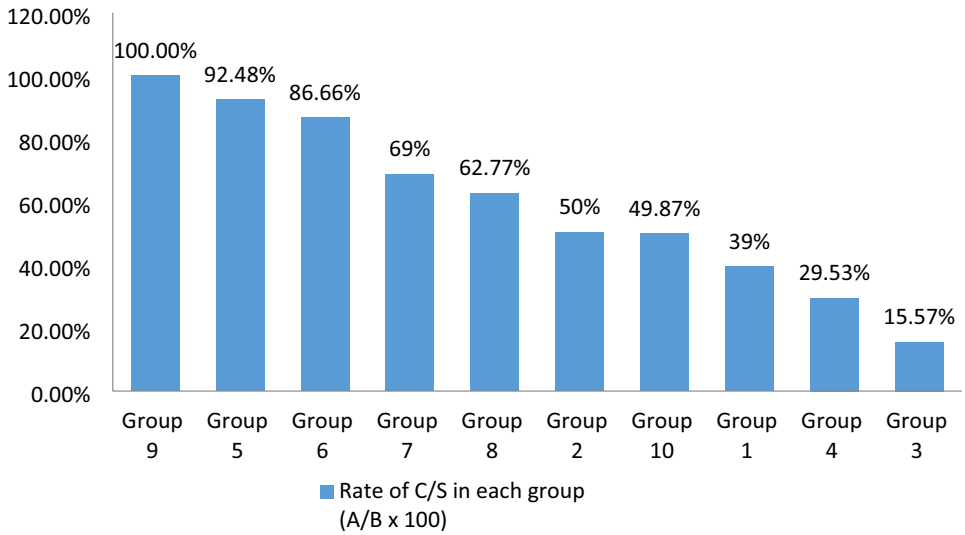

Fig. 2 Rate of CS in each group (A/B × 100)

fear of life threatening complication such as uterine rupture. Repeat CS was thus responsible for increased CS rate. Study conducted by D. Leno et al. reported similar findings [5]. It has been noted that reducing primary CS and successful VBAC (vaginal birth after caesarean) will help reduce CS in this group [6–8]. Patients can be given TOLAC (trial of labor after caesarean) after proper selection of cases. FLAMM scoring system can also be used to reduce the rate of CS [6]. Continuous monitoring of both mother and fetus can ensure successful VBAC. High CS rate in group 5 was also seen in study done by S. Gadappa et al., V. Das et al. and A. Ray et al. [4, 6, 7, 9, 10]. Increase in incidence of CS in primigravida patients can be avoided by avoiding unnecessary induction of labor in primigravida patients [10]. Treating obstetricians need to proficient in conducting vaginal examinations, pelvic assessments and giving trial of labor to patients with borderline pelvis. In our study CS rate was 46.76%. WHO recommends caesarean rate of 10–15%, it may be difficult to achieve this rate in a tertiary institute like LTMMC & GH Sion, Mumbai, catering to a large population of high risk referred cases. Our hospital is located near Asia's largest slum Dharavi. Caesarean section rates were higher than other studies which could be explained by referral of high risk cases requiring emergency CS. Lack of facilities for emergency caesarean section and transfusion of blood and blood products, unavailability of NICU, patients requiring tertiary care (ICU) were some other reasons for referral of cases requiring CS to our institute. Similar high rates were observed in study done by Varija T et al. and Patel RV et al. [11, 12].

As per WHO relative size (B/total number of deliveries × 100) of group 1 and 2 combined should represent 35–42% of obstetric population. In our study the relative size of group 1 and 2 combined was 32.04%. This contribution

Table 3 Ranking according to relative size of each group and rate of caesarean section in each group by Robson classification during our study period

Classification group	Number of caesarean sections in each group (A)	Number of deliveries in each group (B)	Rate of CS in each group (A/B × 100) (%)	Relative size of each group (B/total number of deliveries × 100) (%)	Contribution of CS of each group to total number of CS (A/total number of CS × 100) (%)	Contribution of CS of each group to total number of deliveries i.e., CS rate in each group (A/total number of deliveries × 100) (%)
1	430	1090	39.44	22.84	19.27	9.01
2	221	439	50.34	9.20	9.90	4.63
2a	132	350	37.71	7.33	5.91	2.76
2b	89	89	100	1.86	3.98	1.86
3	164	1053	15.57	22.07	7.35	3.43
4	96	325	29.53	6.81	4.30	2.01
4a	36	265	13.58	5.55	1.61	0.75
4b	60	60	100	1.25	2.68	1.25
5	640	692	92.48	14.50	28.68	13.41
5.1	491	543	90.42	11.38	22	10.29
5.2	149	149	100	3.12	6.67	3.12
6	91	105	86.66	2.20	4.07	1.90
7	86	125	68.80	2.61	3.85	1.80
8	86	137	62.77	2.87	3.85	1.80
9	31	31	100	0.64	1.38	0.64
10	386	774	49.87	16.22	17.30	8.09

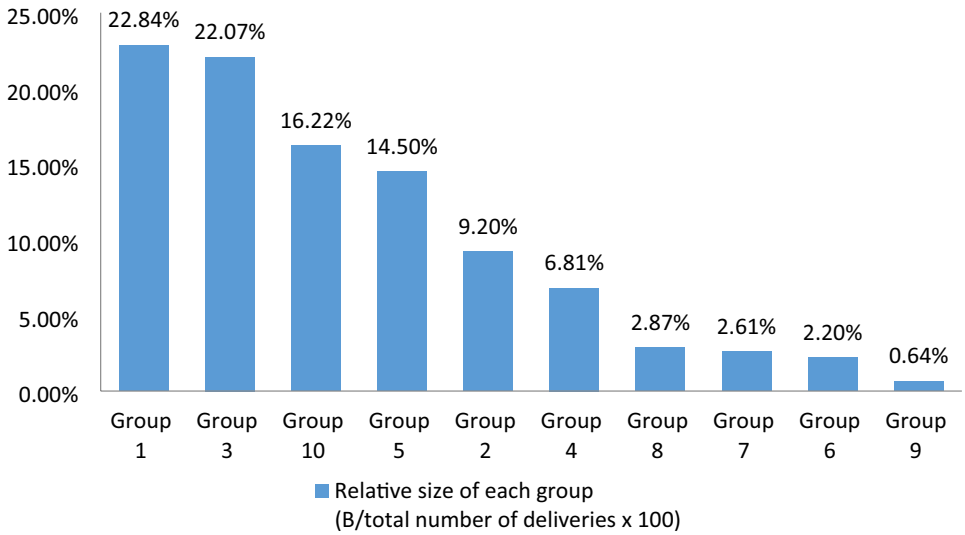

Fig. 3 Relative size of each group (B/total number of deliveries × 100)

is less than WHO expectation as most of our population included multiparous women [3]. Relative size of group 3 and 4 combined usually represents about 30% of women but in our study we found relative size of group 3 and 4 combined is 28.88%. The reason for reduced size of groups 3 and 4 could be that the size of group 5 (repeat CS) is very high [3]. Increase in number of patients in group 5 contributes to overall high CS rate.

Main reason behind rising rates of CS among group 1, 2, 3 and 4 are fetal distress which is one of the most common indication of CS [5, 6, 13]. Studies have shown that increasing number of unnecessary CS are carried out on the basis of non-reassuring fetal heart rate detected by continuous electronic fetal heart monitoring. Many cases of fetal hypoxia and acidosis are predicted on the basis of continuous electronic fetal monitoring [2, 6]. In low risk

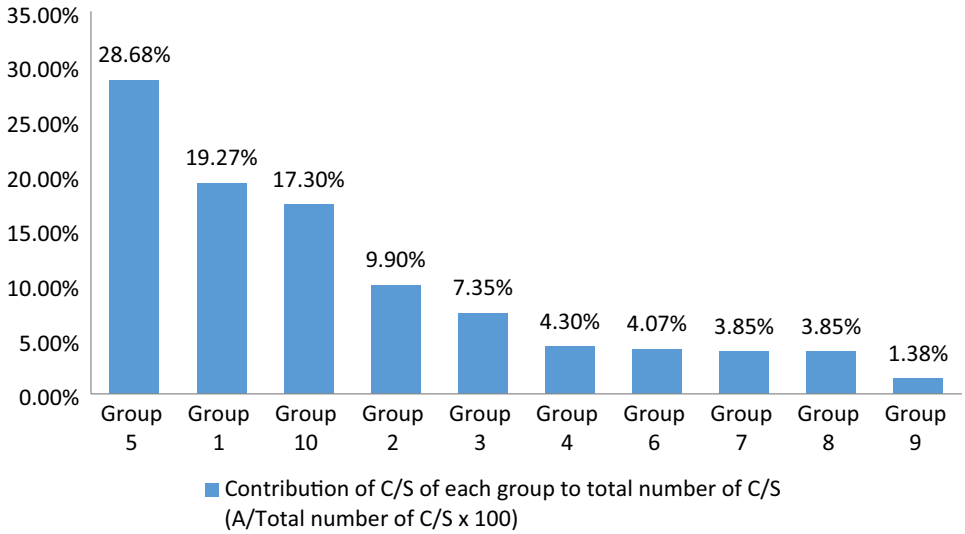

Fig. 4 Contribution of CS of each group to total number of CS (A/Total number of CS × 100)

pregnancies intermittent auscultation with electronic fetal Doppler as opposed to continuous electronic fetal monitoring may be done. It is important to correctly identify cases of fetal distress requiring prompt delivery.

WHO recommends that relative size of groups 6 and 7 which included women with breech presentation should be 3–4%. In our study we found out it to be 4.81%. We should reduce CS in this group by doing external cephalic version in women with breech presentation eligible for this procedure. Vaginal breech delivery can be conducted in suitable women with the help of *Z* score assessment. Similar rates of CS among breech presentation are also found in study done by A. Yerra et al. and M. Patel et al. [14, 15].

As per WHO, relative size of Group 8 should be 1.5–2% but in our study, we found it to be 2.87%, this higher rate is explained by the fact that our hospital is a tertiary care center where patients with high risk pregnancy (including women with multiple pregnancy) get registered for antenatal care. Moreover, patients requiring LSCS are referred from peripheral center's due to lack of adequate facilities for LSCS and NICU at these centers. As per WHO implementation manual relative size of group 9 (women with transverse lie or oblique lie) should be less than 1%. In our study group 9 contributed to 0.64% CS.

Robson group 10 included all women with single cephalic pregnancy who underwent a CS before term gestation (< 37 weeks). In our study group 10 stood at 3rd position for CS. Fetal distress was the primary cause of rising CS in this group. Early delivery in preterm babies may be required if fetus is at risk of hypoxia leading to fetal distress due to high risk maternal and fetal factors [14]. Fear of scar rupture was the primary reason for repeat caesarean deliveries and rising CS rates.

There are various studies where other Robson groups contributed to the largest number of caesarean section rates. Few such studies are as follows:

1. Analysis of caesarean sections using Robson ten-group classification system in a university hospital in eastern Ethiopia: a cross-sectional study by Abera Kenay Tura et al., Robson group 3 was the highest contributor followed by group 5 [16]. Group 3 which included single cephalic multiparous women at term in spontaneous labor with no previous history of CS was the highest contributor to the overall CS rate, contributing 21.4% of all CS. The second highest contributors were (group 5) contributing 21.1% to the overall CS.
2. In a study by Gautam et al. in Kathmandu (Nepal), Robson's group number 2 (which included nulliparous, singleton, cephalic, ≥ 37 weeks, induced labour or cesarean section before labour) was a major contributor for caesarean section [17]. As group 2 was the largest contributor to CS (28%), this shows that we need to be more attentive and concerned regarding proper indications and methods of induction of labour.
3. In a study published by Parveen R et al. from Pakistan. Most of the patients, 85 (50.9%) turned out to be from group-10. group-5 and group-1 were the 2nd and 3rd most common group, accounting for 24 (14.4%) and 19 (11.4%) cases respectively [18].

Thus, we can see that though most of the Indian studies state the Group 5 is the highest contributor to high CS rate, worldwide data suggests several other groups can contribute to high CS rate. Thus, Robson classification is a bench mark tool which enables international comparisons.

Efforts should be taken to reduce the primary CS rate. Increasing vaginal birth after CS (VBAC) and reducing planned repeat caesarean section may bring down CS rate. Reducing primary CS rate and thereby reducing overall CS

rate is the need of the hour [10]. A dedicated and conscious effort should be taken by treating obstetrician to aim for vaginal delivery. Measures like use of partogram to monitor progress of labor, WHO checklist and use of epidural analgesia can reduce cesarean delivery for maternal request to avoid the pain associated with normal labor.

Operative vaginal delivery, external cephalic version and vaginal breech deliveries can be taught by experts in workshops and conferences. We should ensure that these skills are not a dying art and do have a role in modern obstetrics (in skilled hands). Literature studies reveal that VBAC success is 70–80% however rising medicolegal problems act as a barrier to this. However, if proper training is imparted and continuous monitoring is done VBAC can be successfully carried out [19]. The best way to keep rising cesarean rates in check is to reduce primary CS rate [10]. This can be done by counselling mothers who demand LSCS for fear of labor pain and providing them with epidural analgesia for pain relief. Other measures include careful selection of cases for induction of labor and giving a fair trial of labor in these cases by use of partogram**.**

Limitations of Study

1. The term fetal distress as an indication for LSCS is not clearly defined. According to WHO, Robson classification doesn't consider indication of CS for classification instead multiple variables are considered while classifying according to Robson classification. The aim and objective of our study was not to find out the primary cause of C section but to find out group contributing to maximum CS. Since this an observational study the treating physician have taken decision of CS based on fetal distress. When we analyzed data we found that the most common indication mentioned for preterm CS was fetal distress but it was not clearly defined as it was not our objective to find out indication of CS.
2. This study was not done to suggest measures to reduce CS rate. We have conducted this study with primary aim of finding out group with highest CS rate so that this data may guide policy makers and health care workers to reduce CS rate. We are recommending measures to reduce CS in discussion section as we found high rate of repeat CS in our study and after thorough review of literature. Measures suggested to reduce CS rate have not been tested for statistical significance.

Conclusion

WHO recommends Robson 10 group classification as a way to collect information about CS rate. Important information about mode of delivery for different birth groups can be obtained.

In our study, 4771 deliveries were conducted during this study period (6 months). Out of 4771 deliveries, CS was done in 2231 pregnant women (46.76%). 2540 women had vaginal deliveries. Group 5 (13.41%) which comprised of women with previous CS had the highest CS rate followed by group 1 and group 10. The second largest contribution was from group 1 with CS rate of 9.01%. Robson group 1 included nulliparous term women with single cephalic pregnancy in spontaneous labour. Group 10 was the third largest contributor to the overall CS. Group 10 included women who delivered preterm (single cephalic presentation). Group 10 contributed to 8.09% of overall CS rate.

This data can provide a large data for meta-analysis or review articles. Trend of cesarean sections can be predicted using this data and policy makers can use it for forming or altering policies to curb rising CS rates. This data can be used for international and national comparisons across hospitals to study regional factors affecting CS rates.

Internal audit of caesarean births at individual or institute level is recommended. CS rates can be compared within healthcare facilities and between them.

To conclude, we should make every effort to provide CS for women requiring this procedure, rather than work towards achieving a specific rate for CS.

Author Contribution Authors have contributed to the design, data collection, data analysis, writing and proof reading of manuscript.

Funding No funding has been received.

Declarations

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Permission Taken from institutional ethics committee.

Informed Consent Informed consent has been obtained from all participants of this study.

Research Involving Human Participants Study has been approved by institutional ethics board and all procedures performed in study involving human participants were in accordance with the ethical standards of the institution and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

References

1. Mahadik K. Rising cesarean rates: are primary sections overused? J Obstet Gynaecol India. 2019;69(6):483–9. https://doi.org/10.1007/s13224-019-01246-y.
2. Singh A, Malik R. Changing trends and determinants of caesarean section using robson criteria in a government tertiary level hospital. Int J Reprod Contracept Obstet Gynecol. 2021;10:1066–72.

3. Robson classification: implementation manual by WHO dated 26 November 2017 https://www.who.int/publications/i/item/9789241513197
4. Gomathy E, Radhika K, Kondareddy T. Use of the Robson classification to assess caesarean section trends in tertiary hospital. Int J Reprod Contracept Obstet Gynecol. 2018;7:1796–800.
5. Leno DWA, Bah ME, Moumbagna JC, Millimouno TM, Lamah D, Delamou A, et al. Evaluation of caesarean section practices according to Robson's 10-group classification at a level two maternity ward in Conakry, Guinea. Int J Reprod Contracept Obstet Gynecol. 2019;8:4468–73.
6. Gadappa S, Gemavat H, Deshpande S, Shah A. Interventions to reduce caesarean section rates at government medical college and hospital Aurangabad, India. Int J Reprod Contracept Obstet Gynecol. 2020;9:1563. https://doi.org/10.18203/2320-1770.ijrcog20201224.
7. Das V, Kumar N, Kumari V, Agarwal A, Pandey A, Agrawal S. Increasing rates of cesarean section, an upcoming public health problem: an audit of cesarean section in a tertiary care center of North India based on Robson classification. Int J Reprod Contracept Obstet Gynecol. 2017;6:4998–5002.
8. Patra K, Chattopadhyay S, Samanta P, Mondal C. A retrospective analytical study of caesarean section in intrauterine foetal death cases in a rural medical college. Int J Reprod Contracept Obstet Gynecol. 2018;7:2583–5.
9. Ray A, Jose S. Analysis of caesarean-section rates according to Robson's ten group classification system and evaluating the indications within the groups. Int J Reprod Contracept Obstet Gynecol. 2017;6:447–51.
10. Bhatt M, Kadikar G, Parmar DC, Kanani M. Retrospective study of cesarean section by using the Robson's ten group classification system. Int J Reprod Contracept Obstet Gynecol. 2018;7:1054–7.
11. Wahane A, Ghaisas AS. Analysis of caesarean sections according to Robson's criteria at a tertiary care teaching hospital in central India. Int J Reprod Contracept Obstet Gynecol. 2020;9:4221–6.
12. Heera ST, Shenoy ST, Anaswara T, Remash K. Analysis of caesarean delivery using Robson ten group classification system at a tertiary care teaching institute in Kerala, India. Int J Reprod Contracept Obstet Gynecol. 2019;8:1990. https://doi.org/10.18203/2320-1770.ijrcog20191956.
13. Kant A, Mendiratta S. Classification of cesarean section through Robson criteria: an emerging concept to audit the increasing cesarean section rate. Int J Reprod Contracept Obstet Gynecol. 2018;7:4674–7.
14. Yerra AK, Khan MI. Analysing trends in caesarean sections at a tertiary care teaching hospital in South India: findings from a clinical audit using Robson criteria. Int J Reprod Contracept Obstet Gynecol. 2020;9:1463–9.
15. Patel MK, Prajapati SM. A study of cesarean section rate by using modified Robson's ten group classification system. Int J Reprod Contracept Obstet Gynecol. 2019;8:2610–6.
16. Tura AK, Pijpers O, de Man M, et al. Analysis of caesarean sections using Robson 10-group classification system in a university hospital in eastern Ethiopia: a crosssectional study. BMJ Open. 2018;8: e020520. https://doi.org/10.1136/bmjopen-2017-020520.
17. Gautam P, Karki C, Adhikari A. Robson's group 2 criteria among total caesarean sections in a Tertiary Care Hospital: a descriptive cross-sectional study. JNMA J Nepal Med Assoc. 2021;59(243):1098–101. https://doi.org/10.31729/jnma.7138.PMID:35199745;PMCID:PMC9124328.
18. Parveen R, Khakwani M, Naz A, Bhatti R. Analysis of cesarean sections using Robson's ten group classification system. Pak J Med Sci. 2021;37(2):567–71. https://doi.org/10.12669/pjms.37.2.3823.
19. Trojano G, Damiani GR, Olivieri C, Villa M, Malvasi A, Alfonso R, Loverro M, Cicinelli E. VBAC: antenatal predictors of success. Acta Biomed. 2019;90(3):300–9. https://doi.org/10.23750/abm.v90i3.7623.PMID:31580319;PMCID:PMC7233729.