

Robson's 10-group Classification System Analysis of Cesarean Deliveries Performed at a Tertiary Care Teaching Institution

Shashi Lata Kabra¹, Richa Madaan², Sonal Maheshwari³, Pratibha Nanda⁴

Received on: 25 April 2023; Accepted on: 17 August 2023; Published on: 04 December 2023

ABSTRACT

Background: Cesarean section (CS) is defined as the delivery of a fetus through surgical incisions made through the abdominal wall (laparotomy) and the uterine wall (hysterotomy). Cesarean section delivery is to be performed only when it is necessary, as it increases maternal morbidity. There is a substantial rise in the CS rate over the previous three decades, and an objective and scientific analysis of the indications of CS deliveries is necessary to decrease the number. As a result, Robson's classification of global standards has become indispensable. To reduce the rising CS rate, this study used Robson's criteria to analyze the CS trend at a tertiary care teaching hospital. It also identified the proportion of women in each category according to Robson's 10-group categorization scheme and the CS rate among them.

Methods: The Deen Dayal Upadhyay Hospital, a tertiary care teaching hospital in New Delhi, served as the site of this retrospective study. Data were gathered from women who underwent cesarean deliveries between January 2022 and January 2023, and proportions in various categories were computed using Robson's 10-group classification scheme.

Results: About 33.33% of deliveries at DDU Hospital throughout the study period were CS. Robson group I (21.95%) had the highest level of representation in the study group, followed by Robson groups III (20.89%) and 2 (18.74%), while Robson groups VIII (1.23%) and 9 (0.32%) had the lowest levels. Group II came in second at 7.3%, while the Robson group V contributed the most overall to the CS rate at 12.42%. Group IX had a 100% CS rate despite comprising the smallest proportion of the study group.

Conclusion: The most common indication for previous lower segment cesarean section can be reduced by judicious use of trial of labor after cesarean. Every effort must be done to reduce primary CS.

Keywords: Cesarean section, Pregnancy, Robson's 10-group classification.

Journal of South Asian Federation of Obstetrics and Gynaecology (2023): 10.5005/jp-journals-10006-2324

INTRODUCTION

Over the past 20 years, India's cesarean section (CS) delivery rate has continuously climbed, almost 2–3-fold increase in the cesarean rate from about 10% to 15–20%. The exact incidence in India is not known but probably varies from 10 to 20% (up to 40% in some private hospitals). Cesarean sections performed without a medical reason do not lower mother or baby mortality rates if done at a rate higher than 10–15%.¹ The reasons for the increase in the cesarean rates are variable. A few are greater percentage of multipara, increasing incidence of elderly primigravida, use of electronic fetal monitoring, increased diagnosis of fetal distress, decline in instrumental delivery, losing the art of performing vaginal breech delivery in multipara, cesarean in almost all breech presentations, or frequent use of repeat cesarean in women with prior cesarean delivery, medicolegal reasons, and increased rate of induction of labor. Due to potential maternal (increased prevalence of placenta accreta spectrum disease) and neonatal hazards, cost concerns, and access disparities, this global surge in CS rates has become a subject of controversy and growing public health concern.² The following are a few of the most typical short- and long-term complications linked to cesarean procedures. The modern nightmare with an increase in cesarean deliveries is placenta accreta spectrum disorder, which is linked to significant maternal mortality as well as increased maternal mortality and morbidity, increased blood transfusion requirements, prolonged hospital stays, postpartum

^{1,2,4}Department of Obstetrics and Gynecology, Deen Dayal Upadhyay Hospital, Delhi, India

³Department of Obstetrics and Gynecology, Grant Medical College and JJ Hospital, Mumbai, Maharashtra, India

Corresponding Author: Shashi Lata Kabra, Department of Obstetrics and Gynecology, Deen Dayal Upadhyay Hospital, Delhi, India, Phone: +91 9718990168, e-mail: drshashikabra@gmail.com

How to cite this article: Kabra SL, Madaan R, Maheshwari S, et al. Robson's 10-group Classification System Analysis of Cesarean Deliveries Performed at a Tertiary Care Teaching Institution. *J South Asian Feder Obst Gynae* 2023;15(6):643–646.

Source of support: Nil

Conflict of interest: None

infections, primary and secondary postpartum hemorrhage, and increased rates of cesarean delivery.

This suggests that if the wrong options are made, some women may be exposed to these difficulties without needing to; on the other hand, some women may not be receiving CS delivery when they do need it.³ Understanding this issue can be gained by looking at the CS rates at other hospitals and the resulting likely causes behind them. The lack of classification methods that could be utilized internationally, allows for audit feedback, and defining

the ideal CS rate across nations was one of the key challenges. To close this gap and inform initiatives aimed at reducing it, Robson suggested an overall categorization approach in 2001. It allows for a better understanding of the rate of CS in a facility and allows for the identification of important subpopulation groupings.⁴⁻⁶

The Robson's classification is endorsed by the World Health Organization (WHO) and the International Federation of Gynaecology and Obstetrics (FIGO) since it is founded on objective standards and is very precisely defined. These groups suggested using Robson's classification as a benchmark for CS rate assessments, monitoring, and comparisons within and between healthcare facilities over time.⁷

METHODS

This retrospective study was conducted at Deen Dayal Upadhyay Hospital (DDUH), New Delhi, a tertiary care teaching hospital in New Delhi. Deen Dayal Upadhyay Hospital is the single-biggest hospital in West Delhi with an annual delivery rate of approximately 10,000. It caters to a population of approximately 40 lakhs and is a tertiary level referral center for many dispensaries, 50-bedded, 100-bedded, and 200-bedded hospitals. This hospital represents a middle, lower, poor, and very poor class of Delhi and North India, very well.

The study includes all deliveries between January 2022 and January 2023. The goal of this study was to determine the cesarean delivery frequency and indications and to classify them using

Robson's-10 groupings. We were hoping that this study would help us analyze the causes of the growing trend in CS rates in our hospital (representing North India), focus on the causes, and provide recommendations for how to lower this rate.

Data Collection and Analysis

The maternal operation registration and the labor room records held at the hospital were used to compile the data. A standardized questionnaire was used to collect all relevant obstetrics data, which was then monthly entered into an excel chart (parity, manner of prior births, prior CS and indications, gestational age, start of labor, spontaneous or induced labor, and fetal presentation). After a full year, the results were calculated. Calculated percentages included the overall rate, a representation of the overall rate for each category, and a percentage for each group individually. Robson's 10-group classification approach was used for this (Table 1).

RESULTS

In total, 9,199 women gave birth during the research period. According to Robson's 10-group classification method, the majority of the women among them in 2020 (21.958%) and 1922 (20.893%) were in groups I and III, respectively. There were 1724 (18.74%) and 1192 (12.957%) in groups II and V, respectively. About 928 people made up group IV (10.08%). All nulliparous breeches 172 (1.869%) and multiparous breeches 173 (1.88%) women with multiple pregnancies 114 (1.23%). The smallest group of women with abnormal breeches 30 (0.326%) (Tables 2 to 5).

Table 1: Robson's classification of cesarean section⁸

Groups	Clinical characteristics
I	Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labor
II	Nulliparous, singleton, cephalic, ≥37 weeks, induced labor or cesarean section before labor
III	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, spontaneous labor
IV	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, induced labor or cesarean section before labor
V	Multiparous with prior cesarean section, singleton, cephalic, ≥37 weeks
VI	All nulliparous breeches
VII	All multiparous breeches (including previous cesarean section)
VIII	All multiple pregnancies (including previous cesarean section)
IX	All pregnancies with transverse or oblique lie (including those previous cesarean section)
X	Singleton, cephalic, ≤36 weeks (including previous cesarean section)

Table 2: Cesarean section rate and contribution made by each group

Robson's group	Total CS [A]	Total VD [C]	Total CS + VD [B]	Rate in each group A/B × 100	Relative size in each group B/T × 100	Contribution made by each group to total cesarean section rate A/T × 100
I	321	1699	2020	15.89	21.958	3.48
IIA	429	1029	1458	29.4	15.849	4.66
IIB	248	18	266	93.23	2.891	2.69
III	131	1791	1922	6.81	20.893	1.42
IV	198	730	928	21.33	10.088	2.152
V	1143	49	1192	95.88	12.957	12.42
VI	132	40	172	76.74	1.869	1.43
VII	95	78	173	54.91	1.88	1.032
VIII	58	56	114	50.87	1.239	0.630
IX	30	0	30	100	0.326	0.326
X	289	635	924	31.27	10.04	3.141



Table 3: Ranking of Robson's group according to overall CS rate in the study population

Rank	Group	
i	V	12.42%
ii	II	7.3%
iii	I	3.48%
iv	X	3.141%
v	IV	2.15%
vi	III	1.42%
vii	VI	1.43%
viii	VII	1.032%
ix	VIII	0.63%
x	IX	0.326%

Table 4: Ranking of Robson's group according to groupwise contribution to the study population

Rank	Group	
i	I	21.958%
ii	III	20.893%
iii	II	18.74%
iv	V	12.957%
v	IV	10.08%
vi	X	10.04%
vii	VII	1.88%
viii	VI	1.869%
ix	VIII	1.23%
x	IX	0.326%

Table 5: Indications leading to cesarean section in this study

Indications	Number (%)
Previous C-section	1360 (44.24%)
Fetal distress	530 (17.24%)
HTN	198 (6.44%)
Failed induction	160 (5.20%)
CPD	78 (2.53%)
Maternal requests	0 (0%)
Contracted pelvis	20 (0.650%)
Breech	210 (6.83%)
Abruption	24 (0.78%)
Placenta previa	90 (2.92%)
Others	186 (6.05%)
NPOL	200 (6.50%)
Postdatism	18 (0.58%)

DISCUSSION

In our study, out of 9,199 births, 3,074 were delivered via CS, whereas 6,125 were delivered naturally. About 33.33% of births were through CS. In our study, vaginal births occurred at a rate that was almost twice as high as CS births. The CS rate at our hospital is moderately high (33.33%), notwithstanding WHO's suggestion that CS rates higher than 10% are not connected with decreases in maternal and infant mortality rates. This high rate was likely caused by the

fact that we are a tertiary referral center that receives complex pregnancies from numerous ancillary peripheral referral centers.

In our investigation, Robson's I, III, and II were discovered to be the largest contributors of the study population, whereas group V (12.42%) is the major contributor to the CS rate. According to Khan MA et al.,⁹ groups V, II, and X contributed the most to overall CS rates.⁹

The two commonest indications in group II were fetal distress and post-dated pregnancy with failed induction. In these cases, diagnosis of postdatism was based on dates, as in many cases, early USG parameters were not available. Also, most of the cases were induced at 40 weeks. The second most commonest cause in group II was fetal distress, and most of these indications were based on nonreactive CTG findings, which had a 50% false-positive rate that could not be confirmed due to the nonavailability of ultrasound facility during nighttime. However, during the daytime, this was confirmed with ultrasound.

According to Singaporean experts, the three groups that most frequently contribute to CS rates are group V, group II, and group X.³ About 35–40% of deliveries typically belong to groups I and II. Ideally, group I will be larger than group II. Groups I and II made up 40.70% of the study's participants, and group I was larger than group II.

Considering that 30–40% of women fall between groups III and IV, group III should be greater than group IV. In our study, groups III and IV each had 30.98% women, with group III being larger than group IV.

There should not be more than 10% of women in group V. Our study group V has 12.95% women as its makeup. Targeting group V (multipara with at least one prior CS), which was the main contributor to the overall CS rates, is therefore crucial. Therefore, appropriate VBAC counseling and its subsequent use should be used in some low-risk circumstances. Both groups (those with scars and those without scars) should be discouraged from requesting a cesarean delivery.

It is extremely important to comply because groups I and III are made up of nullipara and multipara pregnancies, respectively, without prior CS. Clinical recommendations from ACOG/SMFM to reduce the use of primary cesarean deliveries were reaffirmed in 2019.^{10,11}

Three to four percent of all women should be in groups VI and VII, and group VI is typically twice as big as group VII. About 3.75% of all women were in groups VI and VII, but group VI was smaller than group VII. Unless the facility has an IVF program or is a referral center, which in our case is 1.23%, group VIII should be 1.5–2% women.

In group IX, there should be 0.2–0.6% women and a 100% CS rate. In our study, it is 0.32%.

Group X should have 10% female members, which in our study is 10.41%.

In our study, women in group V who had prior CS contributed the most – 12.60% – to the total CS. The majority of studies conducted in India have made this observation. The study's results are highly comparable to those of domestic and international investigations.^{12,13} It is crucial that attempts to lower the overall CS rate concentrate on lowering the main CS rates and supporting VBAC in patients who have previously had lower segment cesarean section (LSCS).

CONCLUSION

- In this study, the previous LSCS (group V) has the maximum rate of CS, which can be reduced by judicious use of trial of labor

after cesarean as per available infrastructure, equipment, and manpower.

- The rate of LSCS can also be reduced by reducing the rate of primary LSCS and by avoiding unnecessary induction between 40 and 41 weeks and careful monitoring of labor.

Limitations of this Study

- In this trial, we did not track the individuals' maternofetal outcomes.
- The study's retrospective methodology may have prevented the recording of some crucial information.

Strengths of this Study

The study's advantages include a big catchment population that accurately represents North India, tertiary-level hospital research, and a good sample size.

To account for seasonal fluctuations, a 12-month analysis of CS was conducted.

REFERENCES

1. Cagan M, Tanacan A, Hakli DA, et al. Changing rates of the modes of delivery over the decades (1976, 1986, 1996, 2006, and 2016) based on the Robson-10 group classification system in a single tertiary health care center. *J Matern Fetal Neonatal Med* 2021;34(11):1695–1702. DOI: 10.1080/14767058.2019.1644619.
2. Kirchengast S, Hartmann B. Recent lifestyle parameters are associated with increasing cesarean section rates among singleton term births in Austria. *Int J Environ Res Public Health* 2018;16(1):14. DOI: 10.3390/ijerph16010014.
3. Parveen R, Khakwani M, Naz A, et al. Analysis of cesarean sections using Robson's ten group classification system. *Pak J Med Sci* 2021;37(2):567–571. DOI: <https://doi.org/10.12669/pjms.37.2.3823>.
4. Betrán AP, Vindevoghel N, Souza JP, et al. A systematic review of the Robson classification for cesarean section: What works, doesn't work and how to improve it. *PLoS One* 2014;9(6):e97769. DOI: 10.1371/journal.pone.0097769.
5. Robson M. The Ten Group Classification System (TGCS) – A common starting point for more detailed analysis. *BJOG* 2015;122(5):701. DOI: 10.1111/1471-0528.13267.
6. Chen I, Opiyo N, Tavender E, et al. Non-clinical interventions for reducing unnecessary cesarean section. *Cochrane Database Syst Rev* 2018;9(9):CD005528. DOI: 10.1002/14651858.CD005528.pub3.
7. FIGO Working Group on Challenges in Care of Mothers and Infants During Labour and Delivery. Best practice advice on the 10-Group Classification System for cesarean deliveries. *Int J Gynaecol Obstet* 2016;135(2):232–233. DOI: 10.1016/j.ijgo.2016.08.001.
8. Goleman D, Boyatzi R, Mckee A. Robson Classification, Implementation Manual; 2019. pp. 1689–1699.
9. Khan MA, Sohail I, Habib M. Auditing the cesarean section rate by Robson's ten group classification system at tertiary care hospital. *Professional Med J* 2020;27(4):700–706. DOI: 10.29309/TPMJ/2020.27.04.3383.
10. American College of Obstetricians and Gynecologists (College); Society for Maternal-Fetal Medicine, Caughey AB, et al. Safe prevention of the primary cesarean delivery. *Am J Obstet Gynecol* 2014;210(3):179–193. DOI: 10.1016/j.ajog.2014.01.026.
11. Jawa A, Garg S, Bora T, et al. Evaluation of cesarean section rate using Robson's 10 group classification in a tertiary care centre. *IOSR J Dent Med Sci* 2017;16(6):85–89. DOI: 10.9790/0853-1606098589.
12. Gomathy E, Radhika K, Kondareddy T, et al. Use of the Robson classification to assess cesarean section trends in tertiary hospitals. *Int J Reprod, Contracept, Obstet Gynecol* 2018;7(5):1796. DOI: 10.18203/2320-1770.ijrcog20181905.
13. Sah S, Goel R, Goel JK. Analysis of cesarean section rate according to Robson's criteria in tertiary care centre. *Int J Reprod, Contracept, Obstet Gynecol* 2018;7(8). DOI: 10.18203/2320-1770.ijrcog20182947.