



ANALYZING THE TRENDS OF CESAREAN SECTION USING ROBSON'S TEN GROUP CLASSIFICATION

Dr. Vishwas G Gowda	Junior Resident, Department of OBG, KVG Medical College and Hospital Sullia, Dakshina Kannada.
Dr. Geeta Jagannath Doppa	Professor and Head of Department, Department of OBG, KVG Medical College and Hospital Sullia, Dakshina Kannada.
Dr. Ravikanth G O	Additional Professor, Department of OBG, KVG Medical College and Hospital Sullia, Dakshina Kannada.
Dr. Bhavya H U	Additional Professor, Department of OBG, KVG Medical College and Hospital Sullia, Dakshina Kannada.
Dr. Vipul Chandra	Assistant Professor, Department of OBG, KVG Medical College and Hospital Sullia, Dakshina Kannada.

ABSTRACT

Introduction: The Ten-Group Robson classification system (TGCS) is presently recommended by the World health Organization (WHO) in 2015 and International Federation of Gynecology and Obstetrics (FIGO) in 2016 as an effective monitoring tool for comparing Cesarean section (CS) rates within various obstetric units over time as well as between them. **Objective:** To analyze the trends of CS according to Robson's Ten group classification system of 2 years. **Methodology:** This cross-sectional study was conducted at "The Department of OBG, KVG MCH, Sullia, Dakshina Kannada, Karnataka" over the period of 2 years. Robson's TGCS was applied to all the deliveries conducted during the study. CS trends were analyzed for two consecutive years. **Results:** Among 1919 participants in the study period, in the year 2021, out of 815 total deliveries, 368 were CS. After applying Robson's TGCS in 2022, out of 1104 deliveries, 425 CS were done, CS rate was reduced from 45.15% to 38.5%, in consequent year. According to Robson's TGCS, group 5 and group 2 has major contribution to CS rate in both years. Robson's groups 2a, 2b, 4b contributions in 2021 is 10.18%, 4.42%, 1.35% respectively reduced to 6.34%, 0.91%, 0.91% in the year 2022. **Conclusion:** By applying Robson's TGCS, CS rate was reduced in consequent year. By vigilant monitoring, adequate counselling and timely intervention, the major contributors like group 2a, 2b, 4b and 5 are reduced.

KEYWORDS :

INTRODUCTION

Caesarean sections (CS) are the commonest surgery performed in pregnant women, considered to be a life-saving procedure but they do have risks associated in terms of present or future pregnancies. Worldwide, CS rates have ominously risen in the last few decades. In 1985, WHO stated that regional caesarean section rates should not exceed 10–15%¹ for the better maternal and neonatal outcome.

Compared to vaginal deliveries, CS are associated with more maternal and neonatal complications, and financial burden. Immediate and long-term complications of CS include increased risk of maternal morbidity and mortality, postpartum haemorrhage, increased need for blood transfusion, longer hospitalization, postpartum infections, and retained and adherent placenta. Hence, it is very important to study the reasons for the CS trend in different health facilities and population of women. In order to achieve this, there is need for adoption and consistent use of an internationally accepted classification system that has been proven to enhance the analysis and comparison of CS rates at various health settings.

The Ten-Group Robson classification system (TGCS) is presently recommended by the World health Organisation (WHO) in 2015 and International Federation of Gynaecology and Obstetrics (FIGO) in 2016 as an effective monitoring tool for comparing CS rates within various obstetric units over time as well as between them^(2,3). WHO has also endorsed Robson's classification as a "global standard" tool for the monitoring of CS. This system uses obstetric characteristics like parity, gestational age, previous CS, labour onset (spontaneous or induced), presentation and number of foetuses (singleton or multiple) to classify women into ten groups¹.

Three most commonly adopted classifications are "based on primary clinical indications", "the degree of urgency or absolute need for caesarean delivery", and "Robson classification"- as frameworks for auditing CS.

Objective

To analyse the trends of CS according to Robson's Ten group classification system of 2 years.

Methods

This cross-sectional study was conducted at "The Department of Obstetrics and Gynaecology, KVG Medical College and Hospital, Sullia, Dakshina Kannada, Karnataka". Approval from "Institutional ethical committee" was taken for this study. The study population included a total of 1919 deliveries, in which 793 women who underwent CS in the hospital during the specified study period, including 368 participants in the year 2021 and 425 participants in the year 2022. Written consent was taken from all the study participants.

For all the study participants, maternal history, clinical features, clinical examination, management outcomes, pregnancy-related information (gestational age, fetal presentation, number of fetus and onset of labour) and outcomes at discharge were recorded. The dependent variable was Robson classification group (Table.1). All the study information was noted on a predesigned proforma.

All data was entered in SPSS version 26.0 for analysis. Descriptive statistics of study participants and variables were calculated. The Robson group was assigned based on parity, gestational age, previous CS, labour onset (spontaneous or induced), presentation and number of foetuses (singleton or multiple) to classify women into ten groups.

Table.1

Group	Description
1	Nulliparous, single cephalic, ≥37 weeks, spontaneous labour
2A	Nulliparous, single cephalic, ≥37 weeks, induced labour
2B	Nulliparous, single cephalic, ≥37 weeks, caesarean before labour
3	Multiparous (excluding previous caesareans), single cephalic, ≥37 weeks, spontaneous labor
4A	Multiparous (excluding previous caesareans), single cephalic, ≥37 weeks, induced labor
4B	Multiparous (excluding previous caesareans), single cephalic, ≥37 weeks, caesarean before labor
5	Previous caesarean, single cephalic, ≥37 weeks
6	All nulliparous breeches
7	All multiparous breeches (including previous caesareans)
8	All multiple pregnancies (including previous caesareans)
9	All abnormal lies (including previous caesareans)
10	All single cephalic, ≤36 weeks (including previous caesareans)

Inclusion Criteria

Patients who delivered by CS during the given period were included in this study.

Exclusion Criteria

- 1) Term and preterm normal or instrumental vaginally delivered patients.
- 2) Women having laparotomy for uterine rupture or those with missing records.

RESULTS

In the year 2021, out of 815 total deliveries, 368 were CS (45.15%) and in 2022, out of 1104 deliveries, 425 found to be CS (38.5%). In the present study, total number of participants are 793 women who underwent CS in the hospital during the specified study period, including 368 participants in the year 2021 and 425 participants in the year 2022.

In 2021, most of the women were between the age group 21 to 30year i.e,225 women (61.1%), in 2022, most of the women were between the age group 21 to 30year i.e., 270 (63.5%). Majority of the women, belonged to rural area of residence in both the years, i.e., 243 (66%) in 2021 and 307 (72.2%) in 2022.

Characteristics of the Study Participants (Table 2):

Characteristics	2021 (n=368)	2022 (n=425)
Age (years)		
<20	5 (1.3%)	7 (1.6%)
21-30	225 (61.1%)	270 (63.5%)
31-40	135 (36.7%)	140 (32.9%)
>41	3 (0.9%)	8 (2%)
Area of residence		
Rural	243 (66%)	307 (72.2%)
Urban	125 (34%)	118 (27.8%)
Gravidity		
Primigravida	162 (44.2%)	159 (37.4%)
Multigravida	206 (55.8%)	266 (62.6%)
Parity		
Nulliparous	148 (40.2%)	235 (55.3%)
Multiparous	220 (59.8%)	190 (44.7%)
Gestational age (weeks)		
<37	21 (5.7%)	34 (8%)

37-40	315 (85.6%)	323 (76%)
>40	32 (8.7%)	68 (16%)
Onset of Labour		
Spontaneous	156 (42.4%)	200 (47%)
Induction of Labour	23 (9.1%)	34 (8.1%)
Pre-labour cesarean section	189 (51.5%)	191 (44.9%)
Fetal presentation		
Cephalic	402 (94.6%)	353 (95.9%)
Breech	23 (5.4%)	15 (4.1%)
Birth weight (grams)		
<2500	78 (21.2%)	80 (18.8%)
2500-4000	261 (70.9%)	312 (73.4%)
>4000	29 (7.9%)	33 (7.8%)

Indications for caesarean sections are listed in the Table. 3 of both 2021 and 2022.

Table.3 Indications of Caesarean sections

Indications	Number (%)	
	2021	2022
Previous CS	171 (46.4%)	102 (24%)
Fetal distress	61 (16.6%)	76 (17.9%)
Contracted pelvis	10 (2.7%)	22 (5.2%)
NPOL	49 (13.3%)	68 (16%)
Maternal request	19 (5.2%)	41 (9.6%)
Twin pregnancy	3 (0.8%)	8 (1.9%)
PIH	4 (1.1%)	19 (4.5%)
Uncontrolled DM	1 (0.3%)	4 (0.9%)
Mobile head	12 (3.3%)	18 (4.2%)
Big baby	3 (0.8%)	4 (0.9%)
Breech	22 (5.9%)	26 (6.1%)
APH	4 (1.1%)	19 (4.5%)
Severe oligohydramnios	3 (0.8%)	6 (1.4%)
Severe IUGR	4 (1.1%)	8 (1.9%)
Abnormal lie	2 (0.5%)	4 (0.9%)
Total (n)	368 (100%)	425 (100%)

According to Table.3, previous CS and fetal distress were found to be the most common indications for caesarean section in 2021 and 2022.

Table.4. Description of Robson's TGCS Based on FTVD and CS

Classification	Description of Robson's TGCS	Number (%)							
		2021				2022			
		FTND	%	LSCS	%	FTND	%	LSCS	%
1	Nulliparous, single cephalic, ≥37 weeks, spontaneous labour	84	30.31%	50	6.13%	133	12.05%	69	6.25%
2a	Nulliparous, single cephalic, ≥37 weeks, induced labour	99	12.15%	72	8.83%	94	8.51%	77	6.97%
2b	Nulliparous, single cephalic, ≥37 weeks, caesarean section (CS) before labour	0	0.00%	36	4.42%	0	0.00%	25	2.26%
3	Multiparous (excluding previous CS), single cephalic, ≥37 weeks, spontaneous labour	119	14.60%	36	4.42%	237	21.47%	33	2.99%
4a	Multiparous (excluding previous CS), single cephalic, ≥37 weeks, induced labour	126	15.46%	17	2.09%	190	17.23%	14	1.27%
4b	Multiparous (excluding previous CS), single cephalic, ≥37 weeks, CS before labour	0	0.00%	11	1.35%	0	0.00%	10	0.91%
5	All multiparous with at least one previous uterine scar, with single cephalic pregnancy, ≥37 weeks	4	0.49%	110	13.50%	9	0.82%	142	12.86%
6	All multiparous breeches	1	0.12%	9	1.10%	1	0.09%	16	1.45%
7	All multiple pregnancies (including previous CS)	4	0.49%	8	0.98%	7	0.63%	4	0.36%
8	All multiple pregnancies (excluding previous CS)	0	0.00%	3	0.37%	0	0.00%	7	0.63%
9	All abnormal lies (including previous CS)	0	0.00%	2	0.25%	0	0.00%	3	0.27%
10	All single cephalic, <37 weeks (including previous CS)	30	3.23%	14	1.72%	8	0.72%	25	2.26%
		447		368	45.15%	679		425	38.50%

According to Table.4, the maximum contribution of CS was through Robson's group 5 that is all multiparous with at least one previous uterine scar, with single cephalic pregnancy >37 weeks in both 2021 and 2022. The second most common contribution from Robson's group 2 that is nulliparous, single cephalic, ≥37 weeks, in induced or CS before labour in both 2021 and 2022.

The caesarean section rate in group 1 (nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labour) and 3 (multiparous excluding previous cesarean section, singleton, cephalic, ≥37 weeks, spontaneous labour) was less as they came in

spontaneous labour as compared to group 2 (nulliparous, singleton, cephalic, ≥ 37 weeks, induced labour, or cesarean section before labour) in both 2021 and 2022. This indicates, induction of labour increases the chances of CS.

According to Robson's TGCS, group 5 and group 2 has major contribution to CS rate in both years. Robson's groups 2a, 2b, 4a, 4b contributions in 2021 is 8.83%, 4.42%, 2.09%, 1.35% respectively reduced to 6.97%, 2.26%, 1.27% 0.91% in the year 2022.

DISCUSSION

In this study, the overall CS rate is 45.15% and 38.5% respectively in 2021 and 2022, which is much higher than that proposed by the WHO (10-15%)¹.

In the present study, Group 5 and 2 were found to be most prevalent. Similarly, Vogel et al.⁵ analysed the contributions of specific groups through Robson's TGCS in two WHO multicountry surveys among seven high Human Development Index (HDI) countries, eight medium HDI countries, and six low HDI countries. In all three HDI groups, Robson groups 1 and 2 followed by group 5 were the major contributor to the overall CS rate. Similarly, Khan MA et al.⁶ in another research observed Robson's group 5 and group 2 to be the most common.

Failed induction of labour plays a major role in increasing CS rate, that is groups 2a and 4a. There must be a clear-cut evidence-based indication for induction as well as for elective CS. All centres must have critical review and appraisal of induction protocols from time to time⁷. If we focus on reducing the number of primary CS, it would automatically result in lowering repeat CS rate (i.e., group 5) which contributed maximum to the overall CS rate in our study population

In this study, 13.5% in 2021 and 12.86% in 2022 of the study population belonged to Robson's group 5 (multiparous with previous caesarean section, singleton, cephalic, ≥ 37 weeks), so to reduce the rates of repeat caesarean deliveries, we should evaluate on daily basis the indication of primary caesarean sections. This will not only decrease the caesarean section in nulliparous but will also eventually decrease caesarean section in multiparous with previous caesarean section. Suitable patients were counselled for VBAC (vaginal birth after caesarean). Refusal for VBAC was the most common indication, followed by unsuitable candidates for VBAC. Reasons for refusal of VBAC included the fear that prior scar dehiscence or rupture, unable to tolerate labour pain and believing elective repeat caesarean delivery (ERCD) to be a safer mode of delivery. VBAC is associated with decreased maternal morbidity and a decreased risk of complications in future pregnancies, as well as a decrease in the overall CS rate. Hence, for promoting VBAC, the Royal College of Obstetricians and Gynaecologists (RCOG)⁸ recommends the routine use of VBAC checklists during antenatal counselling as they would ensure informed consent and shared decision-making in women undergoing VBAC. In 2021, out of 171 previous CS patients, 115 were with previous 1 CS, 4 (3.4%) succeeded VBAC. In 2022, out of 98 previous CS patients, 60 were with previous 1 CS, 9 (15%) succeeded VBAC. Increase in VBAC attempts in 2022 lead to decrease Robson's group 5 contribution from 13.5% to 12.86%.

There is an increase in the trend of caesarean section on maternal requests, that is 5.2% and 9.6% in present study. So, Obstetricians must be aware of the importance and consequences of decisions about the mode of delivery, as neither method is devoid of risks.

CONCLUSION

The study's findings highlight the urgency of addressing the escalating CS rates, which can have significant implications

for maternal and neonatal health. By applying Robson's TGCS, this study provides actionable insights into the contributors of elevated CS rates. Strategies aimed at reducing primary CS instances, promoting VBAC, and enhancing patient education are imperative to optimize childbirth practices and align with international recommendations. Ongoing vigilance, research and collaboration within the healthcare community are crucial to achieving a balanced and evidence based approach caesarean section practices.

REFERENCES

1. Ye J, Betrán AP, Vela MG, Souza JP, Zhang J. Searching for the optimal rate of medically necessary caesarean delivery. *Birth* 2014; 41: 237-44.
2. Betrán AP, Torloni MR, Zhang J, Gülmezoglu AM, WHO Working Group on Caesarean Section. WHO statement on caesarean section rates. *BJOG*. 2016;123(5):667-70. <https://doi.org/10.1111/1471-0528.13526>
3. 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 caesarean deliveries. *Int J Gynaecol Obstet*. 2016;135:232-3.
4. Robson MS. Classification of caesarean sections. *Fetal and maternal medicine review*. 2001; 12(01):23-39
5. Vogel JP, Betrán AP, Vindeoghel N, et al.: Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry surveys. *Lancet Glob Health*. 2015, 3:e260-70. [10.1016/S2214-109X\(15\)70094-X](https://doi.org/10.1016/S2214-109X(15)70094-X)
6. Khan MA, Sohail I, Habib M. Auditing the caesarean 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
7. Chaillet N, Dumont A. Evidence based strategies for reducing caesarean section rates: a meta[analysis]. *Birth*. 2007 Mar;34(1):53-64.
8. Royal College of Obstetricians and Gynecologists. Birth after previous caesarean birth (green-top guideline No. 45). (2015). Accessed: January 30, 2022: <https://www.rcog.org.uk/en/guidelines-researchservices/guidelines/gtg45/>.