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ASSESSMENT OF PATTERN OF CAESAREAN SECTION USING ROBSON'S TEN GROUP CLASSIFICATION SYSTEM IN TERTIARY CARE HOSPITAL

Obstetrics & Gynaecology

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ABSTRACT

Background: Robson's Classification System is instrumental in benchmarking and improving maternal care. By categorizing patients based on their specific clinical circumstances, the system allows for a nuanced analysis of C-section rates and their underlying causes. Present study was aimed to assess pattern of caesarean section using Robson's ten group classification system in tertiary care hospital. **Material And Methods:** Present study was cross-sectional study, conducted in women who delivered via C-Section at our hospital during the study period, were then classified according to Robinson's 10 groups. **Results:** In our hospital, during the course of the study, out of 1000 deliveries, 391 (39.1%) were LSCS deliveries and 609 (60.9%) were vaginal deliveries. As per ROBSON ten group classification system among various groups, maximum proportion of LSCS (LSCS rate) (100%) was observed in group 9 (women with abnormal lie), followed by 75.5% in group 5 (women with previous LSCS, single cephalic, >37 weeks) and 42.5% in nulliparous patients with single cephalic, >37 weeks in group 1 (spontaneous labour).Lowest LSCS rate was observed in group 8 (women with multiple pregnancies). Maximum number of patients of LSCS were from Category 5 (women with previous CS, single cephalic, >37 weeks) (191, 48.8%) and from Category 2 (Nulliparous women, single cephalic, >37 weeks, induced or CS before labor) (117, 29.9%). Minimum patients were in Category 9 (women abnormal lies) (2, 0.5%) and Category 8 (women with multiple pregnancies) (5, 1.3%). **Conclusion:** The application of ROBSON'S criteria to assess the pattern of caesarean sections in the study has provided valuable insights into the distribution and trends of caesarean deliveries within the sample size. The study revealed that majority of caesarean sections were concentrated within ROBSON'S group 5 – 48.8% (All multi-parous women, at least one previous uterine scar, single, cephalic,>37 weeks gestation).

KEYWORDS

ROBSON'S criteria, caesarean section, classification, LSCS

INTRODUCTION:

Caesarean section represents the most significant operative intervention in all of obstetrics. Its development and application has saved the lives of countless mothers and infants. However, it's inappropriate use can be a direct and avoidable cause of maternal mortality and morbidity. The frequency with which it is carried out continues to rise and has in many hospitals and health regions reached rates in excess of 30%.[1]

While Caesarean section has become increasingly prevalent in modern obstetrics, the rise in C-section rates has spurred significant debate regarding its indications and appropriateness. In response, Robson's Classification System was developed to categorize C-sections based on specific criteria, providing a structured framework for analyzing and improving obstetric practices.[2,3]

The Robson Classification System categorizes pregnant women into ten distinct groups based on a combination of factors including parity, previous cesarean section history, onset of labor, fetal presentation, and the presence of multiple gestations. Robson's Classification System is instrumental in benchmarking and improving maternal care. By categorizing patients based on their specific clinical circumstances, the system allows for a nuanced analysis of C-section rates and their underlying causes.[4,5,6] Present study was aimed to assess pattern of caesarean section using Robson's ten group classification system in tertiary care hospital.

MATERIAL AND METHODS:

Present study was cross-sectional study, conducted in department of Obstetrics & Gynaecology at RCSM Government medical college and CPR hospital, Kolhapur, Maharashtra, India. Study duration was of 2 years (July 2022 to June 2024). Study was approved by institutional ethical committee.

Inclusion Criteria

- All women who delivered via C-Section at our hospital during the study period, willing to participate in present study

Exclusion Criteria

- All mothers who will be delivered via C-Sections outside the hospital.
- Unknown gestation, gestational age (GA) <28 weeks (including miscarriages and ectopic pregnancies).

Study was explained to participants in local language & written informed consent was taken. All women who delivered during this period were included in the study, the total no of women who delivered every month was counted overall and caesarean section rate was calculated these were then classified according to Robinson's 10 groups.

The Robson Classification

1. Group 1 Nulliparous, single, cephalic, >37weeks, spontaneous labour
2. Group 2 Nulliparous, single, cephalic, >37 weeks, induced labour or delivered by caesarean section before labour.
3. Group 3 Multi-parous women, no previous uterine scar, single, cephalic >37 weeks, spontaneous labour.
4. Group 4 Multi-parous women, no previous uterine scar,>37 weeks, either had induced labour or were delivered by elective caesarean section.
5. Group 5 All multi-parous women, at least one previous uterine scar, single, cephalic,>37 weeks gestation
6. Group 6 All nulliparous women, single, breech pregnancy (all nulliparous women with breech presentation)
7. Group 7 Multi-parous women, single, breech, Including women with previous uterine scars. (all multi-parous women with breech presentation)
8. Group 8 All women with multiple pregnancies ,including women with previous uterine scars (all multiple pregnancies)
9. Group 9 All women with a single pregnancy, transverse, oblique, including women with previous uterine scars. (all abnormal lies)
10. Group 10 All women with single, cephalic,<37 weeks, including women with previous scars.

Caesarean section rate in each group was calculated and analysed. All pregnancies <26 weeks were excluded from the study. The data was collected and analysed using descriptive statistics and data was presented using percentage and proportion. Descriptive statistical analysis was done.

RESULTS:

In our hospital, during the course of the study, out of 1000 deliveries, 391 (39.1%) were LSCS deliveries and 609 (60.9%) were vaginal deliveries. As per ROBSON ten group classification system among various groups, maximum proportion of LSCS (LSCS rate) (100%) was observed in group 9 (women with abnormal lie), followed by

75.5% in group 5 (women with previous LSCS, single cephalic, >37 weeks) and 42.5% in nulliparous patients with single cephalic, >37 weeks in group 1 (spontaneous labour).Lowest LSCS rate was observed in group 8 (women with multiple pregnancies).

Maximum number of patients of LSCS were from Category 5 (women with previous CS, single cephalic, >37 weeks) (191, 48.8%) and from Category 2 (Nulliparous women, single cephalic, >37 weeks, induced or CS before labor) (117, 29.9%). Minimum patients were in Category 9 (women abnormal lies) (2, 0.5%) and Category 8 (women with multiple pregnancies) (5, 1.3%).

Table 1. Frequency Of LSCS In Each Group:

Categories	Type of Delivery		Total	LSCS (n=391)	
	LSCS	Vaginal		Frequency	Percent
Category 1	31(42.5%)	42(57.5%)	73(100%)	31	7.9
Category 2	117(37%)	199(63%)	316(100%)	117	29.9
Category 3	7(14.3%)	42(85.7%)	49(100%)	7	1.8
Category 4	13(14.4%)	77(85.6%)	90(100%)	13	3.3
Category 5	191(75.5%)	62(24.5%)	253(100%)	191	48.8
Category 6	11(15.5%)	60(84.5%)	71(100%)	11	2.8
Category 7	7(20.0%)	28(80%)	35(100%)	7	1.8
Category 8	5(8.1%)	57(91.9%)	62(100%)	5	1.3
Category 9	2(100%)	0(0.0%)	2(100%)	2	0.5
Category 10	7(14.3%)	42(85.7%)	49(100%)	7	1.8
Total	391(39.1%)	609 (60.9%)	1000(100%)	391	100.0

In the present study, out of 391 patients who underwent LSCS, almost half (197, 50.4%) belong to age group 21 to 25 yrs and 117 (29.9%) from age group 26 to 30 yrs. Mean age of the patients was 25.2±3.9 yrs ranging from 19 to 40 yrs. More than half (222, 56.8%) were primiparous and 169 (43.2%) were nulli- parous.

383 (97.9%) had gestational age >37 weeks and only 7 (2.1%) had gestational age ≤ 37 weeks. 388 (98.7%) had singleton pregnancy and only 5 (1.3%) had were multiple pregnancy with 2 or more fetuses. 365 (93.4%) Cephalic presentation, Breech was present in 24 (6.1%) and Transverse in 2 (0.5%) patients.

Table 2- General Characteristics:

General characteristics		Frequency	Percent
Age Group	18 to 20 Yrs	41	10.5
	21 to 25 Yrs	197	50.4
	26 to 30 Yrs	117	29.9
	31 to 35 Yrs	31	7.9
	36 to 40 Yrs	5	1.3
Parity	Nullipara	169	43.2%
	Primipara	222	56.8%
Gestational-age	≤37 Weeks	7	2.1%
	>37 Weeks	383	97.9%
Number of pregnancies	Single	386	98.7%
	Multiple	5	1.3%
Presentation	Cephalic	365	93.4%
	Breech	24	6.1%
	Transverse	2	0.5%

Proportion of intra-op complications was maximum in group 5 (46.1%) (Scar Dehiscence 29.3%, Adhesions 15.7%, Plastered Abdomen 0.5% and PPH 0.5%) and Group 9 (50%) (adhesions in 50% patients).

Table 3. Category-wise Intra-op Complications Of LSCS:

Categories	Adhesions	Plastered Abdomen	PPH	UTI	Scar Dehiscence	No	Total	P value
Category 1	0 (0%)	0 (0%)	0(0%)	0 (0%)	0(0%)	31 (100%)	31 (100%)	0.371
Category 2	0 (0%)	0 (0%)	2(1.7%)	1(0.9%)	0(0%)	114(97.4%)	117(100%)	0.000
Category 3	0 (0%)	0 (0%)	0(0%)	0(0%)	0(0%)	7(100%)	7(100%)	0.793
Category 4	0 (0%)	0(0%)	1(7.7%)	0(0%)	0(0%)	12(92.3%)	13(100%)	0.363
Category 5	30(15.7%)	1(0.5%)	1(0.5%)	0(0%)	56(29.3%)	103(53.9%)	191(100%)	0.000
Category 6	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	11(100%)	11(100%)	0.615
Category 7	1 (14.2%)	0(0%)	0(0%)	0(0%)	1(14.2%)	5(71.4%)	7(100%)	0.993
Category 8	2 (40%)	0(0%)	1(20%)	0(0%)	2(40%)	0(0%)	5(100%)	0.000
Category 9	1 (50%)	0(0%)	0(0%)	0(0%)	0(0%)	1(50%)	2(100%)	0.530
Category 10	1 (14.2%)	0(0%)	1(14.2%)	0(0%)	0(0%)	5(71.4%)	7(100%)	0.380
Total	35 (9%)	1(0.3%)	6(1.5%)	1(0.3%)	59(15.1%)	289(73.9%)	391(100%)	

Proportion of post-op complications was maximum in group 10 (15.3%) (fever) followed by group 5 (2.1%) (Anemia, Fever, URTI, Wound Gap)and only 0.8% in group 2 (fever) but association was not significant in all 3 groups.

Table 4. Category-wise Post-op Complications Of LSCS:

Categories	Anemia	Fever	RTI	Wound Gap	No	Total	P value
Category 1	0(0%)	0(0%)	0(0%)	0(0%)	31(100%)	31(100%)	0.910
Category 2	0(0%)	1(0.8%)	0(0%)	0(0%)	116(99.2%)	117(100%)	0.707
Category 3	0(0%)	0(0%)	0(0%)	0(0%)	7(100%)	7(100%)	0.994
Category 4	0(0%)	0(0%)	0(0%)	0(0%)	13(100%)	13(100%)	0.982
Category 5	1(0.5%)	1(0.5%)	1(0.5%)	1(0.5%)	187(97.9%)	191(100%)	0.330
Category 6	0(0%)	0(0%)	0(0%)	0(0%)	11(100%)	11(100%)	0.987
Category 7	0(0%)	0(0%)	0(0%)	0(0%)	7(100%)	7(100%)	0.994
Category 8	0(0%)	0(0%)	0(0%)	0(0%)	5(100%)	5(100%)	0.997
Category 9	0(0%)	0(0%)	0(0%)	0(0%)	2(100%)	2(100%)	1.000
Category 10	0(0%)	1(15.3%)	0(0%)	0(0%)	6(85.7%)	7(100%)	0.339
Total	1(0.3%)	3(0.8%)	1(0.3%)	1(0.3%)	385(98.5%)	391(100%)	

Proportion of patients who needed blood transfusion was maximum in group 8 (20%) and in 10 (15.3%) group but association was not significant in both groups (p values 0.997 and 0.339).

Table 5. Category-wise Need Of Blood Transfusion During LSCS:

Categories	Blood Transfusion Needed	Blood Transfusion not needed	Total	P value
Category 1	0(0.0%)	31(100%)	31(100%)	0.910
Category 2	3(2.6%)	114(97.4%)	117(100%)	0.707
Category 3	0(0%)	7(100%)	7(100%)	0.994
Category 4	0(0%)	13(100%)	13(100%)	0.982
Category 5	4(2.1%)	187(97.9%)	191(100%)	0.330
Category 6	0(0%)	11(100%)	11(100%)	0.987
Category 7	0(0%)	7(100%)	7(100%)	0.994
Category 8	1(20%)	4(80%)	5(100%)	0.997
Category 9	0(0%)	2(100%)	2(100%)	1.000
Category 10	1(15.3%)	6(85.7%)	7(100%)	0.339
Total	9(0.0%)	382(0.0%)	391(100%)	

In the present study, post-operative Hb (10.37±0.95 gm/dL) was significantly low compared to pre-operative Hb (11.84±0.99 gm/dL).

Table 6. Comparison of pre- and post-operative Hemoglobin of the patients underwent LSCS:

Pre-operative Hb	Standard Error of Mean	Post-operative Hb	Standard Error of Mean	P value
11.84±0.99	0.050	10.37±0.95	0.048	<0.001

DISCUSSION:

Cesarean section is a prevalent surgical intervention in obstetrics and poses significant clinical risks for maternity hospitals. This procedure often leads to extended hospital stays, elevated healthcare costs, and increased morbidity for both the mother and neonate. The implications of cesarean delivery extend beyond individual patient outcomes,

influencing overall resource utilization and institutional expenses. Additionally, the increased risk exposure associated with cesarean sections adds complexity to patient management and care strategies.

The practice of cesarean delivery is a focal point of ongoing debate within both the public and professional domains, reflecting concerns about its appropriate use. Clinical discussions frequently center on the balance between the benefits and risks of cesarean delivery, emphasizing the need for evidence-based decision-making. Ethical considerations also arise, particularly regarding patient autonomy and informed consent in the context of surgical interventions. Legal questions concerning the standards of care and potential liabilities further complicate the discourse surrounding cesarean sections.[7] As such, cesarean delivery remains a multifaceted issue, demanding continuous evaluation and reflection from both medical and societal perspectives. Addressing these challenges requires a comprehensive approach that integrates clinical evidence, ethical principles, and legal considerations to optimize maternal and neonatal outcomes.

Cesarean section (C-section) rates have become a significant metric in assessing global maternal healthcare practices. Recent data from 2010 to 2018, encompassing 154 countries and covering 94.5% of global live births, reveals substantial variability in cesarean delivery rates across different regions. This comprehensive dataset highlights a global average of 21.1% for cesarean births, with pronounced regional disparities and trends indicating an overall increase in cesarean rates since 1990.[8]

In study by Gehanath Baral et al.,[3] overall cesarean section (CS) rate was found to be 34%, with a range of 32% to 35%. When excluding both spontaneous and induced labor, the rate of prelabor cesarean sections was calculated to be 14.5%. For Groups 1, 2, and 3 combined, which represent 81% of the total cases, the cesarean section rate was 21%. Conversely, Groups 5 and 10 exhibited cesarean rates of 11.3% and 23.3%, respectively. The prelabor cesarean section rates for Groups 2b and 4b were observed to be 3.54%, with an additional 11% attributed to cases of malpresentation and preterm births. Analysis of cesarean section rates starting from Class 5 and beyond, as well as the ratio of Groups 1 and 2, aligned with the recommendations established by the Robson classification system. However, it was noted that 67% of cesarean sections were not identifiable through the Robson classification system. This discrepancy arose because the indications for cesarean sections evolved during the course of labor, and these evolving attributes were not pre-classified by the Robson system.

L Janani et al.,[5] noted that overall cesarean section (CS) rate was 35.2%. The largest contributions to the obstetric population were from Group 3 (multiparous women with no previous CS undergoing spontaneous labor) at 27.6% and Group 1 (nulliparous women in spontaneous labor) at 23.7%. The majority of CS procedures were performed in women from Group 5 (multiparous women with a history of lower segment CS) at 11%, followed by Group 2 (nulliparous women with either induced labor or prelabor CS) at 8.6%, and Group 4 (multiparous women with no prior CS undergoing induction or prelabor CS) at 5.5%.

Shamala Devi Karalasingam et al.,[9] noted an upward trend in cesarean section rates in Group 1 (nulliparous women with a term pregnancy in spontaneous labor) and Group 3 (multiparous women with a term pregnancy in spontaneous labor) from 2011 to 2015. The subgroup contributing most significantly to the overall cesarean section rates was Group 5 (multiparous women with a singleton, cephalic fetus ≥37 weeks' gestation and a history of previous cesarean section), with rates remaining consistently high throughout the five-year study period. Conversely, Groups 6, 7, and 9 exhibited the highest cesarean section rates but contributed minimally to the overall cesarean section rates.

In study by Hitendrasing Rajput et al.,[10] the group with the highest cesarean section rate was Group 5, which included women with a previous cesarean section and a single, term, head-first baby, accounting for 13.41% of all cesareans. The other major contributors to the high cesarean rate at our facility were Group 1 and Group 10.

The limitations of the Robson classification system are evident as it fails to capture cesarean sections resulting from complications that arise or change during labor. Consequently, the system's effectiveness in reflecting real-time clinical decisions and outcomes is limited. These findings underscore the need for potential modifications to the Robson classification to better account for dynamic clinical conditions that influence cesarean delivery decisions.

The adoption of Robson's classification is increasing rapidly and is occurring spontaneously across various regions worldwide. Despite its limitations, the classification remains straightforward to implement and interpret. Suggested modifications to the classification could prove beneficial in assisting healthcare facilities and countries as they work toward more effective implementation and reduced heterogeneity in its application.

CONCLUSION:

The application of ROBSON'S criteria to assess the pattern of caesarean sections in the study has provided valuable insights into the distribution and trends of caesarean deliveries within the sample size. The study revealed that majority of caesarean sections were concentrated within ROBSON'S group 5 – 48.8% (All multi-parous women, at least one previous uterine scar, single, cephalic,>37 weeks gestation).

This pattern underscores the importance of targeted interventions and management strategies to address the factors contributing to the high caesarean rates in the groups. This study helps in the future research focusing on the implementation evidence based practices to address the identified patterns and further refine the strategies for reducing unnecessary caesarean section. The study helps to target the groups require more in depth analysis to identify possible modifiable factors and to apply specific intervention to reduce the caesarean section rate.

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