Primary vs Repeat Cesarean Section Rates: A Robson Group-Based Analysis in a Tertiary Care Hospital

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Abstract

Background: Cesarean section (CS) rates are rising globally, with implications for maternal and neonatal outcomes. The Robson Ten Group Classification System provides a standardized approach to evaluate and compare CS rates .

Objective:

To analyze primary and repeat cesarean section rates across Robson groups in a tertiary care hospital and identify key contributors to the overall CS rate.

Methods:

This retrospective study reviewed deliveries from [13/7/25 to 13/1/26] at [**DR VITTHALRAO VIKHE PATIL PRAVARA HOSPITAL, LONI)** All women delivering at ≥28 weeks of gestation during the study period were included. Women were classified into one of the ten Robson groups based on parity, previous cesarean section, onset of labor, fetal presentation, gestational age, and number of fetuses, as described by Robson [1].

Cesarean sections were categorized as primary (first cesarean delivery) or repeat (one or more previous cesarean deliveries). Robson group–wise CS rates and percentage contribution of each group to the overall CS rate were calculated, in accordance with WHO recommendations [2,4].

Results

During the study period (July–January), a total of 960 cesarean sections were performed at the tertiary care hospital and were classified according to the Robson Ten Group Classification System.

Conclusion

This Robson Ten Group Classification–based analysis demonstrates that repeat cesarean section (Group 5) is the leading contributor to the overall cesarean section rate in this tertiary care hospital. However, a substantial proportion of cesarean deliveries arise from primary cesarean sections among nulliparous women (Groups 1 and 2). The findings highlight the cumulative impact of primary cesarean sections on future obstetric outcomes. Optimizing labor management in nulliparous women, ensuring judicious use of labor induction, and promoting vaginal birth after cesarean (VBAC) in appropriately selected cases are crucial strategies to reduce both primary and repeat cesarean section rates without compromising maternal or neonatal safety. This distribution pattern is consistent with findings from other tertiary care centres using the Robson classification [3,7,10].

Introduction

Cesarean section (CS) is one of the most commonly performed obstetric procedures worldwide. Although lifesaving, a rising CS rate without proportional improvement in maternal or neonatal outcomes has raised global concern. The World Health Organization (WHO) recommends regular auditing of CS rates to ensure appropriate use of the procedure [2,4].

The Robson Ten Group Classification System, proposed in 2001, provides a standardized, mutually exclusive, and totally inclusive method to classify women undergoing delivery, enabling meaningful comparison of CS rates across institutions and over time [1]. Differentiating primary from repeat cesarean sections within Robson groups is crucial, as unnecessary primary CS substantially contributes to the growing pool of repeat CS, particularly in tertiary referral centres [3,7].

This study aims to analyze primary versus repeat cesarean section rates using the Robson classification in a tertiary care hospital and to identify major contributors to the overall CS rate.

Methods

Study Design & Setting

A retrospective observational study conducted at [**DR VITTHALRAO VIKHE PATIL PRAVARA HOSPITAL, LONI**], a tertiary care referral centre in [Loni, Maharashtra India], covering [13/7/25 to 13/1/26].

Population

All women who delivered at ≥28 weeks gestation during the study period. Exclusion criteria: [e.g., fetal demise, missing records]

Robson Classification

Women were categorized into the 10 Robson groups based on parity, gestational age, fetal presentation, previous CS, onset of labor, and number of fetuses.

Definitions

- Primary CS: First cesarean delivery.
- Repeat CS: Cesarean in women with ≥1 prior CS.

Data Collection

Data were extracted from hospital records on gestational age, parity, previous CS history, labor onset, fetal presentation, and mode of delivery.

Outcomes

- Robson group-specific CS rates
- Contribution of each group to total CS
- Comparison of primary vs repeat CS rates

Distribution of Cesarean Sections by Robson Group

- Robson Group 5 (Previous cesarean, singleton, cephalic, ≥37 weeks) was the largest contributor, accounting for 303 cesarean sections (31.6%) of all CS.
- Primary cesarean sections, represented mainly by Robson Groups 1–4, constituted 412 cases (42.9%).
    - Group 1: 179 cases (18.6%)
    - Group 2: 144 cases (15.0%)
    - Group 3: 59 cases (6.1%)
    - Group 4: 30 cases (3.1%)
- Other contributing groups included:
    - Group 10 (preterm singleton cephalic): 141 cases (14.7%)
    - Group 6 (nulliparous breech): 45 cases (4.7%)
    - Group 8 (multiple pregnancy): 36 cases (3.8%)
    - Group 7 (multiparous breech): 20 cases (2.1%)
    - Group 9 (transverse/oblique lie): 3 cases (0.3%)

Primary vs Repeat Cesarean Section Rates

- Primary cesarean sections accounted for 42.9% of all cesarean deliveries.
- Repeat cesarean sections (Group 5) alone contributed 31.6% of the total cesarean section rate.
- The remaining 25.5% of cesarean sections were contributed by high-risk obstetric groups (Groups 6–10 excluding Group 5).

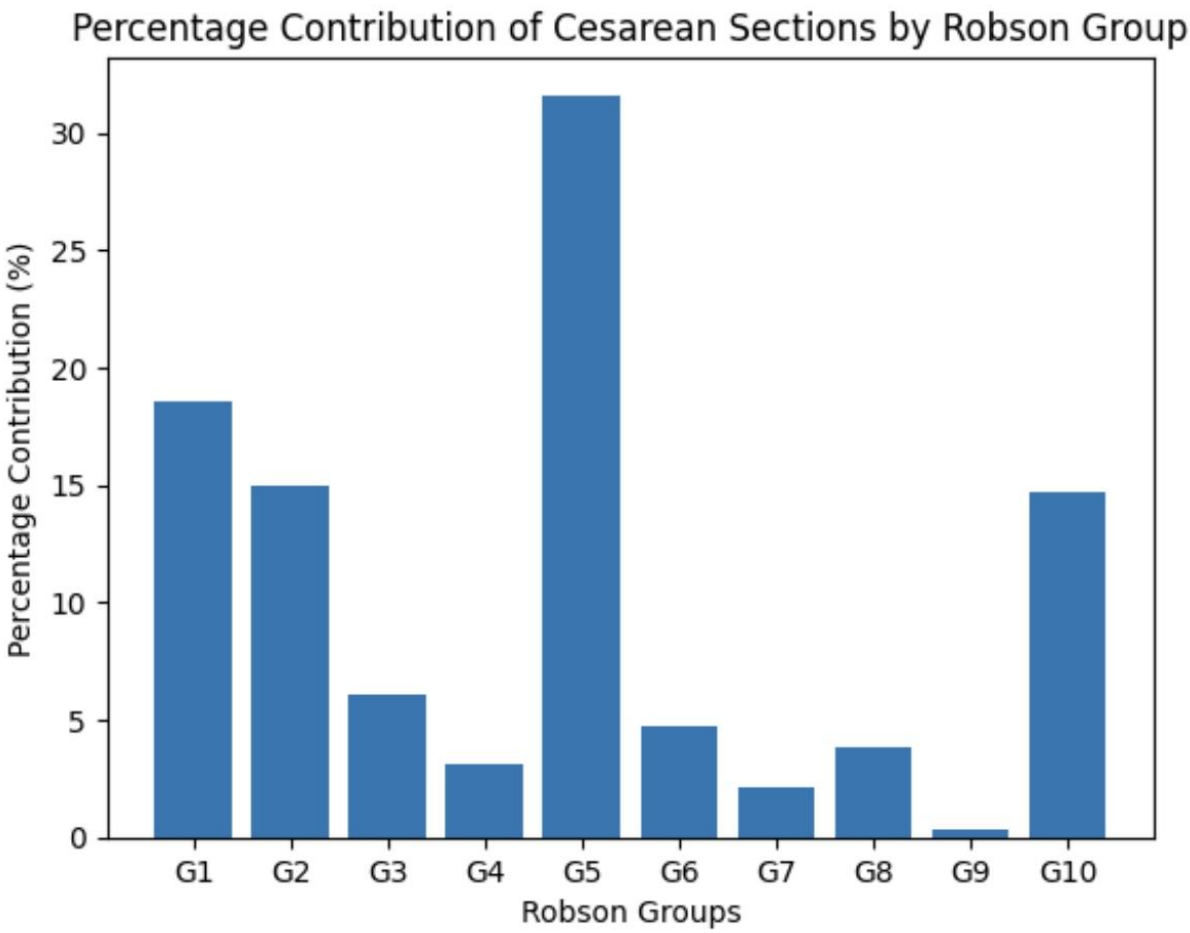
TABLE

Table 1. Distribution and Percent Contribution of Cesarean Sections by Robson Group (n = 960)

Robson Group	Obstetric Characteristics	Number of CS (n)	Percentage (%)
Group 1	Nulliparous, singleton, cephalic, â‰¥37 weeks, spontaneous labor	179	18.6
Group 2	Nulliparous, singleton, cephalic, â‰¥37 weeks, induced / pre-labor CS	144	15.0
Group 3	Multiparous, no previous CS, singleton, cephalic, â‰¥37 weeks, spontaneous labor	59	6.1
Group 4	Multiparous, no previous CS, singleton, cephalic, â‰¥37 weeks, induced / pre-labor CS	30	3.1
Group 5	Previous CS, singleton, cephalic,>37 weeks	303	31.6
Group 6	Nulliparous, singleton breech	45	4.7
Group 7	Multiparous, singleton breech (including previous CS)	20	2.1
Group 8	Multiple pregnancy	36	3.8
Group 9	Transverse / oblique lie	3	0.3
Group 10	Singleton, cephalic, <37 weeks	141	14.7
Total	960	100	

Table 2. Contribution of Primary vs Repeat Cesarean Sections

Category	Robson group(s)	Number of cesarean sections (n)	Percentage contribution (%)
Primary cesarean section	Groups 1â€“4	412	42.9
Repeat cesarean section	Group 5	303	31.6
Cesarean section in other groups*	Groups 6â€“10 (excluding Group 5)	245	25.5
Total	960	100	

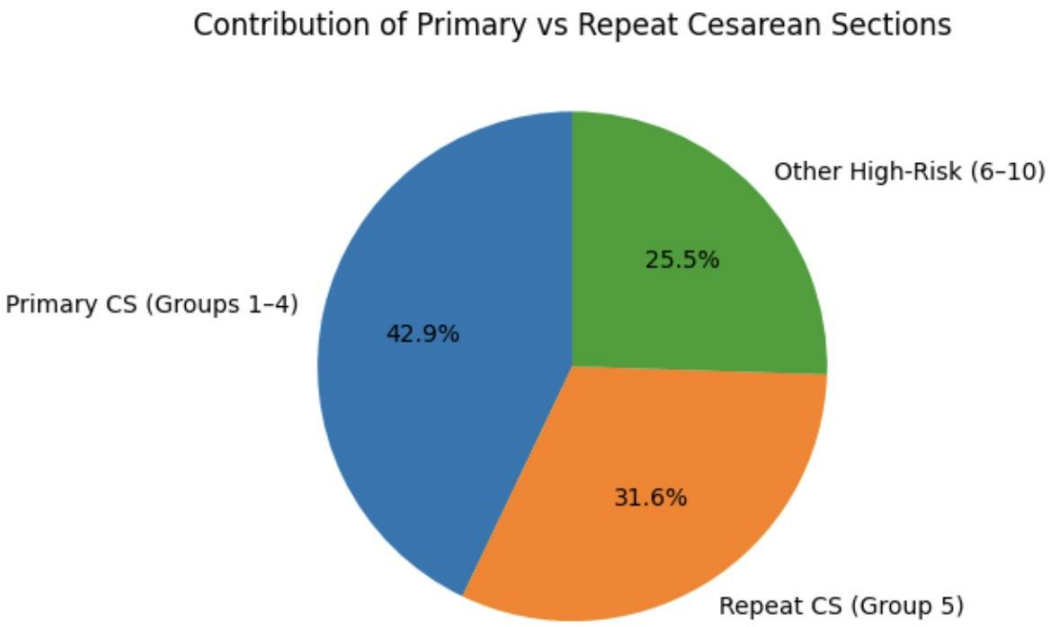


DISCUSSION

- Repeat cesarean sections, mainly from Robson Group 5, were the major contributors to the overall CS rate, consistent with WHO multicountry surveys and institutional audits [3,7].
- The high repeat CS burden highlights the long-term impact of primary cesarean delivery decisions.
- Primary CS rates were highest among nulliparous women undergoing induction or pre-labor cesarean (Robson Group 2), in agreement with previous studies [9,10]
- Targeted reduction of unnecessary primary CS, along with standardized labor management, judicious induction practices, and promotion of VBAC, may effectively reduce avoidable cesarean deliveries without compromising safety [5,6].

Interpretation

This Robson group–based analysis demonstrates that repeat cesarean section (Robson Group 5) is the single largest contributor to the overall cesarean section rate in this tertiary care hospital. This finding reflects the cumulative effect of previous primary cesarean sections and highlights the critical role of reducing primary cesarean rates to control future repeat procedures



Among primary cesarean sections, Robson Groups 1 and 2 (nulliparous women with term singleton cephalic pregnancies) together accounted for a substantial proportion of cesarean deliveries. This suggests that labor management in nulliparous women, including appropriate use of induction protocols, partogram-guided labor, and adherence to evidence-based definitions of labor dystocia, could significantly impact the primary cesarean section rate.

The notable contribution from Group 10 indicates a high burden of preterm and high-risk referrals, which is expected in a tertiary care center. Cesarean sections in Groups 6–9 were comparatively lower and largely unavoidable due to malpresentations and multiple pregnancies.

Overall, the findings emphasize that strategies aimed at reducing unnecessary primary cesarean sections, along with promoting vaginal birth after cesarean (VBAC) in eligible women, could substantially reduce the overall cesarean section rate without compromising maternal or neonatal outcomes.

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