



A Retrospective Study of Caesarean Section Rates Using Robson's Ten-Group Classification System at a Tertiary Care Center

Dr. Obullam Srisai¹, Dr. Palli Sudhir Babu², Dr. S. Bhanurekha³

¹MS OBG (Post Graduate), Department of Obstetrics and Gynaecology, SVS Medical College and Hospital, Mahabubnagar

²MD OBG, MBA, HHSM, Professor & HOD, Department of Obstetrics and Gynaecology, SVS Medical College and Hospital, Mahabubnagar

³Designation: MD OBG, Professor, Department of Obstetrics and Gynaecology, SVS Medical College and Hospital, Mahabubnagar

Corresponding Author

Dr. Obullam Srisai

MS OBG (Post Graduate),
Department of Obstetrics and
Gynaecology, SVS Medical College
and Hospital, Mahabubnagar

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Abstract

Background: The amount of CS being performed has been rising worldwide from the recommended optimum amount of 10-15% by the WHO.

Methods: Retrospective observational study was conducted at SVS Medical College and hospital, Mahabubnagar. All deliveries (n=830) over 3 months (September-November 2025) were classified using Robson's classification system. Information presented was parity, gestational age, onset of labor, presentation, and history of cesarean section.

Results: Overall CS rate was 67.96% (564/830). 31.3% of all CS cases were contributed by Group 5 (Previous CS). Group 2 (nulliparous, induced labour) added 18.1%, while Group 1 (nulliparous, spontaneous labour) added 18.1%. These three groups combined had 73.5% of all cesareans. The most common indications were: previous LSCS (28.5%), fetal distress (23%) and non-progression of labor (11.5%).

Conclusion: The load of CS is predominantly carried by women with prior CS as well as nulliparous women. To minimize unnecessary cesarean sections, targeted interventions such as promoting safe VBAC, optimizing induction protocols, and better management of the labor process are crucial.

Keywords: Caesarean section; Robson classification; maternal morbidity; audit; labor management.

INTRODUCTION

Caesarean section (CS) is a life-saving surgical procedure for mother and baby when pregnancy, labor and delivery become complicated. Many countries in the world now have rates of CS that exceed 20-30%, which is below the optimal rate recommended by the World Health Organization (WHO) of 10-15%. This is an international public health problem because it's happening across the globe on an increasing scale above medically needed quantities.

CS is effective if medically indicated but is very risky. CS is associated with higher maternal risk of infection, transfusion, peripartum hysterectomy and maternal death. Furthermore, women who have had a cesarean section are slightly more likely to experience fetal distress, premature delivery and stillbirth for their subsequent children. These complications represent a major burden on the health-care resources and play a role in increasing maternal morbidity and mortality.

The aim of the present study was to determine the CS rates in a tertiary care centre based on Robson's Classification System, to determine the proportion of women who had contributed to the overall CS rate and to make informed recommendations for reducing unnecessary CS without compromising the safety of mothers and babies.

AIMS AND OBJECTIVES

Primary Aim: To determine the overall caesarean section rate at SVS Medical College Hospital using Robson's Ten-Group Classification System.

Specific Objectives: (1) To classify all deliveries according to Robson's Ten-Group Classification System; (2) To identify which groups of women contribute most significantly to the overall caesarean section rate; (3) To analyze the specific indications for caesarean section within each Robson group; (4) To assess areas where clinical practice can be improved to reduce unnecessary caesarean sections; (5) To provide evidence-based recommendations for institutional protocol development.

MATERIALS AND METHODS

Study Design and Setting

A retrospective observational hospital-based study was done at Department of Obstetrics and Gynaecology, SVS Medical College and Hospital, Mahabubnagar, Telangana, India. SVS Medical College is a tertiary care teaching hospital which offers obstetric facilities to urban and rural people of the region.

Study Population and Period

The study population included all women delivering at SVS Medical College Hospital, during a 3-month study period from 1st September 2025 to 1st November 2025. Inclusion criteria: women who are pregnant and had a gestational age $\geq$ 28 weeks at delivery. Exclusion criteria: Women who were undergoing laparotomy for uterine rupture. Medical records were reviewed to gather data in a retrospective manner.

Data Collection

A structured proforma was used to systematically extract data from maternal hospital records. Data collected were: Demographic data (age, parity, and socioeconomic status, and booking status); obstetric history (gravida, parity, previous mode of delivery, indication for previous cesarean section); current pregnancy parameters (gestational age at delivery, number of fetuses, presentation, amniotic fluid volume); labour parameters; indications for cesarean section; and neonatal outcome. The collected variables were subsequently used to classify all the women into groups according to Robson's Ten-Group Classification System.

Robson's Ten-Group Classification System

All deliveries are classified into one of 10 mutually exclusive groups depending on the mother's parity, multiple gestation, fetal presentation, gestational age at delivery, onset of labor and prior cesarean delivery

Statistical Analysis

The data were analyzed using the IBM SPSS 23. All the continuous variables were reported as mean $\pm$ standard deviation and the categorical variables as absolute numbers and percentages.

RESULTS

Study Population and Overall Caesarean Section Rate

A total of 830 deliveries were analyzed during 3 months study period in SVS Medical College Hospital, Mahabubnagar. Of these 564 women had caesarean delivery with a total caesarean section rate of 67.96 per cent (564/830). This is much higher than optimal CS rate of 10-15 percent recommended by WHO, which meant that the institution had a high burden of operative delivery.

Overall Mode of Delivery Distribution

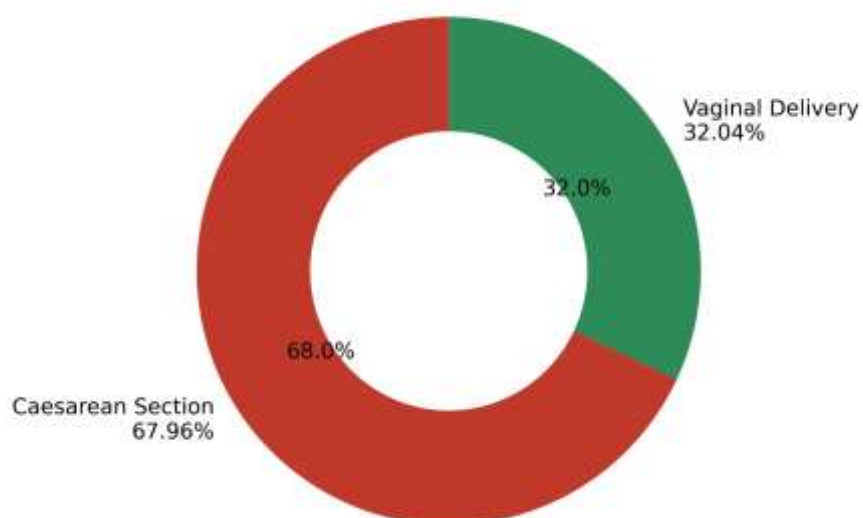


Figure 1: Overall mode of delivery distribution among women delivered during the study period.

Table 1: Overall Caesarean Section Rate

Total Deliveries	Caesarean Sections	CS Rate (%)
830	564	67.96

Distribution by Robson Groups

The no. of women who had previously had a cesarean section (Group 5) was the highest (24.6 per cent, n=204). The total number of deliveries in groups 1 and 2 (nulliparous women) was 270 (32.5%). The other groups were Group 4, multiparous and induced (8.4%, n=70) and Group 3, multiparous and spontaneous (4.8%, n=40). There were 90 deliveries in Group 10 (preterm deliveries), accounting for 10.8 percent of all deliveries. The other groups (6,7,8,9) made up 2.4 per cent of all deliveries (n=20).

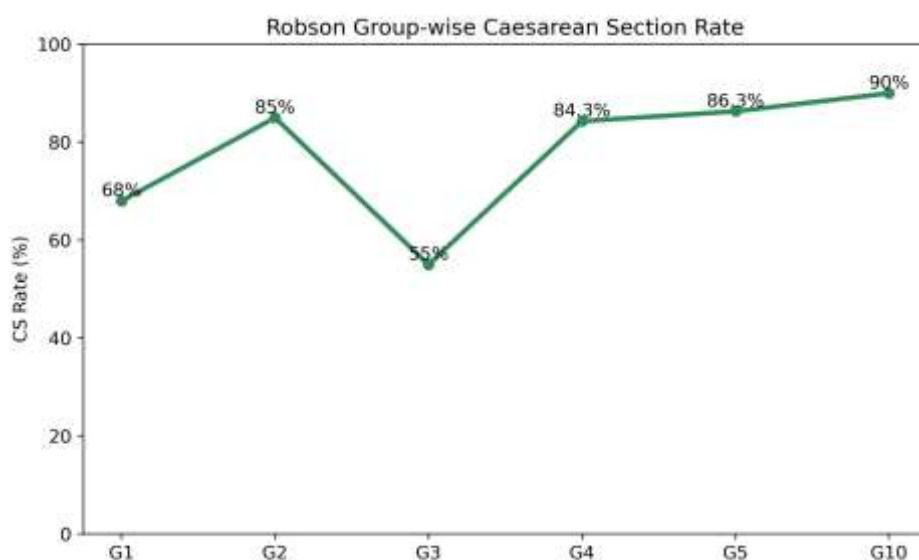


Figure 2: Robson group-wise caesarean section rates among major Robson group

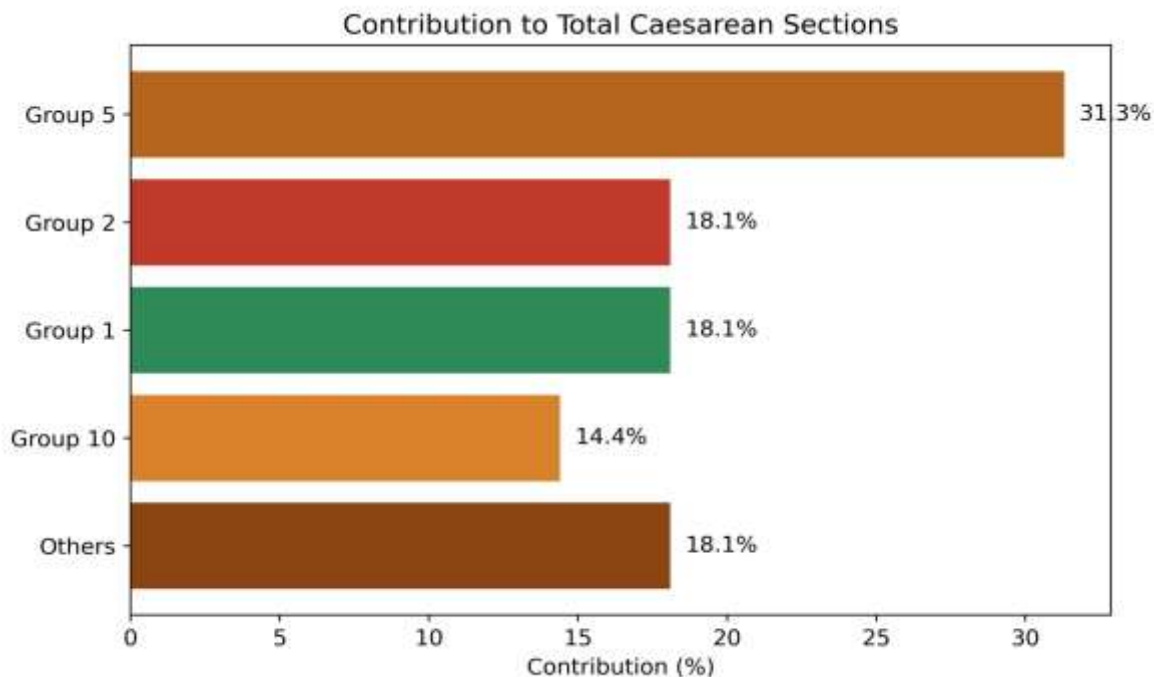
Table 2: Distribution of Women According to Robson Groups and Caesarean Section Rates

Robson Group	Description	Total Women (n)	CS Cases (n)	CS Rate (%)
1	Nulliparous, cephalic, ≥ 37 w, spontaneous labor	150	102	68.0
2	Nulliparous, cephalic, ≥ 37 w, induced labor	120	102	85.0
3	Multiparous, cephalic, ≥ 37 w, spontaneous labor	40	22	55.0
4	Multiparous, cephalic, ≥ 37 w, induced labor	70	59	84.3
5	Previous caesarean section	204	176	86.3
10	Preterm (less than 37 weeks)	90	81	90.0
TOTAL		674	542	80.4

Contribution of Each Robson Group to Overall Caesarean Section Rate

The highest contribution to the CS rate was from group 5 (previous CS) with 176 of 564 CS (31.3%). The proportion of nulliparous women who had undergone induced birth or CS prior to labour was 18.1 per cent (102/564) (Group 2). Group 1 (nulliparous and spontaneous labor) accounted for 18.1 percent (102/564). Incredibly, three of these groups combined represented 73.5% of all caesarean sections.

The next largest numbers of students belonged to Group 10 (preterm deliveries) with 14.4 percent (81/564) and Group 4 (multiparous, induced labour) with 10.5 percent (59/564). The other groups (3, 6, 7, 8, 9) accounted for just 7.8 % of CS cases.

**Figure 3: Contribution of major Robson groups to the total caesarean section burden****Table 3: Contribution of Each Robson Group to Total Caesarean Sections**

Robson Group	Number of CS Cases	Percentage of Total CS (%)	Cumulative Percentage (%)
Group 5	176	31.3	31.3
Group 2	102	18.1	49.4
Group 1	102	18.1	67.5
Group 10	81	14.4	81.9
TOTAL	564	100.0	

Indications for Caesarean Section

The most frequent indication of caesarean delivery was previous caesarean section (160/564 or 28.5%). An important intrapartum complication was fetal distress which followed in 23.0 percent (130/564). Labor related complications included non-progression of labor (11.5 percent or 65/564), and failed induction (10.0 percent or 56/564). There was 1 cephalopelvic disproportion (48/564, 8.5 percent) in maternal pelvic factors. Malpresentation (breech, transverse lie: 7.0 percent, 39/564) was the second most common presentation. In 6.0 percent (34/564), there were maternal complications such as, hypertensive disorders (preeclampsia, eclampsia, PIH). The rest 5.5 per cent was due to other indications such as meconium stained liquor, cord prolapse, post-dated pregnancy, multiple pregnancy, and ante-partum hemorrhage.

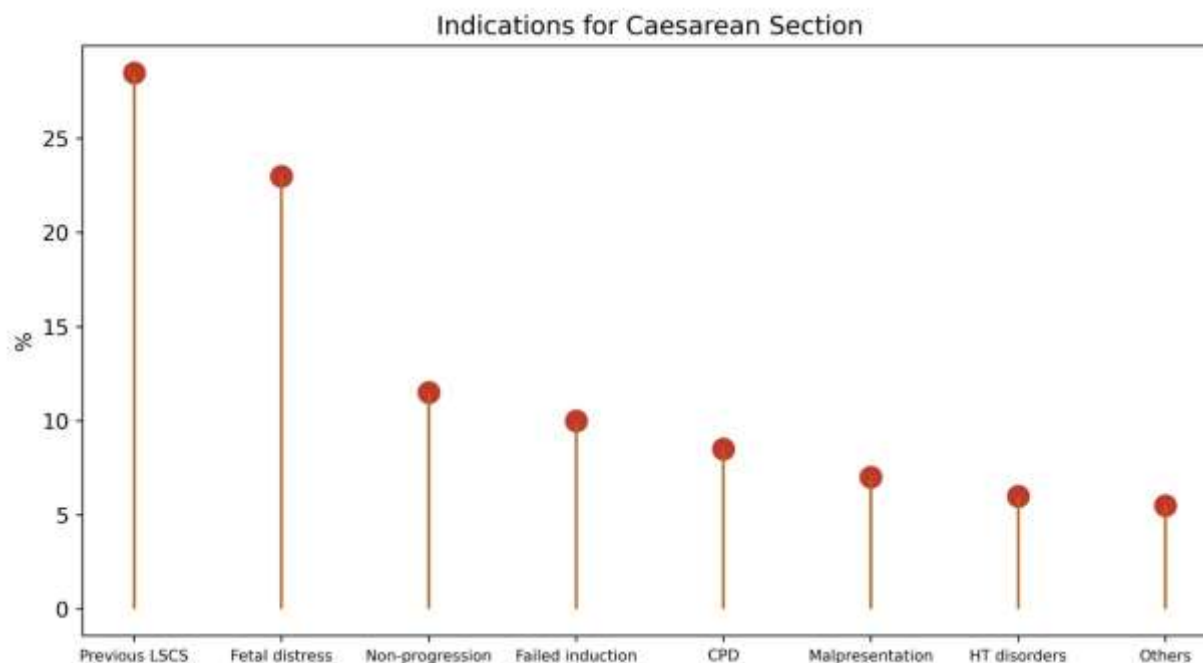


Figure 4: Distribution of clinical indications for caesarean section

Table 4: Indications for Caesarean Section

Indication for Caesarean Section	Number of Cases	Percentage (%)
Previous LSCS	160	28.5
Fetal distress	130	23.0
Non-progression of labour	65	11.5
Failed induction	56	10.0
Cephalopelvic disproportion	48	8.5
Malpresentation (breech, transverse)	39	7.0
Hypertensive disorders	34	6.0
Other causes	32	5.5
TOTAL	564	100.0

DISCUSSION

The rate of caesarean section at SVS Medical College Hospital (67.96 per cent) is much higher than the recommended WHO level of 10-15 per cent, reflecting the increasing trend towards higher rates of CS in the world and highlighting significant scope for quality improvement. The analysis conducted with Robson's Ten-Group Classification System is helpful to understand the specific factors driving this high rate and can be used as a data informed lens to guide interventions.

Key Findings and Their Significance

Perhaps most interesting is that the sum of women who had previously given birth by caesarean section (Group 5) and women with no previous births (Groups 1 and 2) represents 73.5 percent of all caesareans. This pattern is a critical problem because women who have previously had CS are at increased risk of repeat CS and high rates of primary CS in nulliparous women will lead to more women with previous CS in subsequent pregnancies.

It was found that women who have had a previous caesarean delivery make up almost one-third of all institutional CS

cases (31.3%), suggesting that women who have previously had a CS are significantly responsible for the majority of CS cases. In this group, CS rate was 86.3 per cent indicating that most women who had undergone CS had repeat CS. This prompts concern over the choice of candidates for Vaginal Delivery After Caesarean (VBAC) and overuse of repeat cesarean.

Groups 1-2 (nulliparous women) accounted for 36.2 percent of CS cases, with Group 2 (induced labor) having a higher CS rate than Group 1 (68.0 percent). Which indicates that induction protocols are not being followed optimally or that unnecessary inductions are being done. Mathematically the difference in percentage point between Groups 1 and 2 is significant and it is important to investigate induction practices, such as assessment of candidates, induction methods and definition of what constitutes a failure of induction]p-[-.

Clinical Implications and Recommendations

Based on these findings, the following targeted interventions are recommended:

1. Support VBAC: Make sure that protocols are in place to select eligible candidates for VBAC trial. Set clear selection criteria, enhance intrapartum monitoring and offer comprehensive counseling on benefits and risks. This may help to lower the CS rate in group 5, from current 86.3 per cent to 50-60 per cent of eligible women.
2. Optimize induction practices: Standardise induction procedure and ensure adequate candidate selection, cervical assessment (Bishop score), induction methods. Assessment of cervical readiness and correct diagnosis and use of augmentation versus failed induction is critical.
3. Enhance Labor Management: Apply active labor management procedures with partograph, established definitions of labor abnormalities and evidence based augmentation procedures. It is crucial that residents and nursing staff be properly trained to prevent unnecessary primary caesarean sections.
4. Improve Fetal Assessment: Improve training in cardiotocography interpretation and fetal scalp sampling where available; minimize overdiagnosis of fetal distress by using effective communication of non-reassuring patterns.
5. Regular Audit and Feedback: Conduct monthly audit and give feedback to clinicians on group specific and indication specific CS rates based on Robson classification. Involve clinicians in identifying barriers to change, and make sustainable improvements.
6. Multidisciplinary Approach: Ensure a committee of obstetricians, midwives, anesthesiologists, and paediatricians is set up to create and follow evidence-based guidelines and track results.

Limitations and Strengths

There are some limitations to this study: (1) Retrospective design, using hospital records, which may not have complete information for some variables; (2) Study period of three months, which is a relatively short period; (3) No complete information on neonatal and maternal outcomes; (4) Single center study that may not be generalizable.

The strengths of the study are: (1) All deliveries classified systematically according to Robson classification, which provides a framework for comparison; (2) Large sample size of 830 deliveries; (3) Detailed analysis of the indications for CS; (4) Identification of specific high-contributing groups for targeted interventions.

CONCLUSION

The finding of this study is quite significant with a high rate of caesarean section (67.96 percent) which is much higher than the recommendations of WHO. The primary contributors are women with previous caesarean section (Group 5, 31.3 percent), nulliparous with induced labour (Group 2, 18.1 percent), and nulliparous with spontaneous labour (Group 1, 18.1 percent) who make up 73.5 percent of all caesarean sections.

The heavy burden of CS on these three groups has made it easy to identify areas where targeted interventions can be implemented. There are evidence-based approaches that may significantly decrease unnecessary cesareans without compromising maternal and infant safety, including promotion of VBAC, optimization of induction protocols, improved management of labor, and improved assessment of the fetus.

Engagement and feedback from multiple disciplines and clinicians, along with implementation of institutional protocols and regular audit-led quality improvement efforts, are crucial for reducing CS rates in a sustainable way. The Robson classification system is helpful in identifying specific problem areas and tracking the effects of interventions from one time to another. This audit-led evidence-based strategy can be used as a template to other tertiary care centers with similar issues of rising caesarean section rate.

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