

Assessment of Caesarean Section Rate using Robson Ten Group Classification System in a Tertiary Care Centre, Kakinada, Andhra Pradesh

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Abstract:

Introduction: Since the late 19th century ideal rate of the caesarean section is considered to be 10-15%. However, there has been a recent rapid surge in the number of caesarean sections being done in various medical care centres because of various reasons. To restrain this upward trend of caesarean section rates, an audit at each medical care centre is necessary. ROBSONS ten-group classification system is one of the more widely accepted methods.

Aim: Analysis of caesarean section audit according to Robson criteria at tertiary health care centre.

Objectives: 1. Identify and analyse the group of females which contribute most and least to overall caesarean section rate. 2. Assess the effectiveness of strategies or interventions targeted at optimising the role of caesarean section.

Methods: A retrospective observational study was conducted in the Department of obstetrics, Government General Hospital attached to Rangaraya Medical College for a period of 12 months from January 2023 to December 2023.

Results: During the course of this study, a total number of 2856 deliveries were recorded. Among them, 1682 (58.89%) were caesarean sections. The major cause for the caesarean section is found to be the Group 5 [multiparous with previous caesarean section, more than 37 weeks] of ROBSONS ten group classification system followed by Group 2 and 1. Caesarean section rate is much higher in primigravid as than in multigravidas in our institution.

Conclusion: Induction of labour based on bishops score is best to reduce the caesarean section rate in group 2 patients. TOLACs have to be encouraged to reduce the caesarean section rate in group 5 patients.

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Introduction

In the initial days, caesarean section was conducted only in dead women or dying women in an attempt to save the fetus. In the 19th century, with the advent of refined anaesthesia and surgical techniques, there was a considerable reduction in both mortality and morbidity. Later Caesarean sections have been performed only when it is medically indicated. Immediate complications like maternal infections, haemorrhage, respiratory distress syndrome, intestinal obstruction can occur postoperatively.

Other late complications like placenta previa, incisional hernia, adhesions formation and placenta accreta can occur. Caesarean section can lead to prolonged hospital stay and delay initiation of

breastfeeding when compared to normal vaginal delivery. Various studies focused on the proportionate rise in the rate of caesarean section deliveries all across the world, particularly in private healthcare centres. Recent data from 154 countries, accounting for 95% of the live births registered in the world reveals that around 20% of women underwent caesarean section due to various indications. In India, the prevalence of caesarean rate ranges from as low as 5.2% (Nagaland) to as high as 60.7% (Telangana). Caesarean section rate has been increased to 21.5% (2019-21) from less than 3% in 1992-93. Few studies reported that maternal preference for caesarean section either due to fear of labour pain or superstition of auspicious time. Even though caesarean section is a

lifesaving surgery in a few cases, it must be advised only if indicated.

Unnecessary caesarean sections should be avoided to minimize their complications and also to reduce the cost burden on the healthcare system. World Health Organization (WHO) suggested Robson's ten-group classification system as a standard stool for the identification, analysis, comparison and surveillance of caesarean section rates worldwide to optimize caesarean section rates. Based on five characteristics (parity, number of foetus, previous caesarean section, onset of labour, gestational age, and fetal presentation) this system categorizes all women into ten categories.

Aim and Objectives

1. To assess the caesarean section rate.
2. To assess the factors responsible for caesarean sections based on ROBSON's ten group classification system.
3. To optimize the rate of caesarean section in our institute.

4. To signify the importance of ROBSON's ten-group classification system in restraining the caesarean section rate

Materials and Methods

A retrospective observational study was conducted among all the women who underwent caesarean section from 1/1/2023 to 31/12/2023 in the Department of Obstetrics and Gynaecology, Government General Hospital attached to Rangaraya Medical College, Kakinada.

A pretested questionnaire designed based on the data obtained from the hospital medical records, comprising basic obstetric data such as parity, mode of previous deliveries, previous caesarean section indications, gestational age, onset of labour, and spontaneous or induced labour was used. Based on these characteristics patients were categorized with the help of Robson's ten-group classification system.

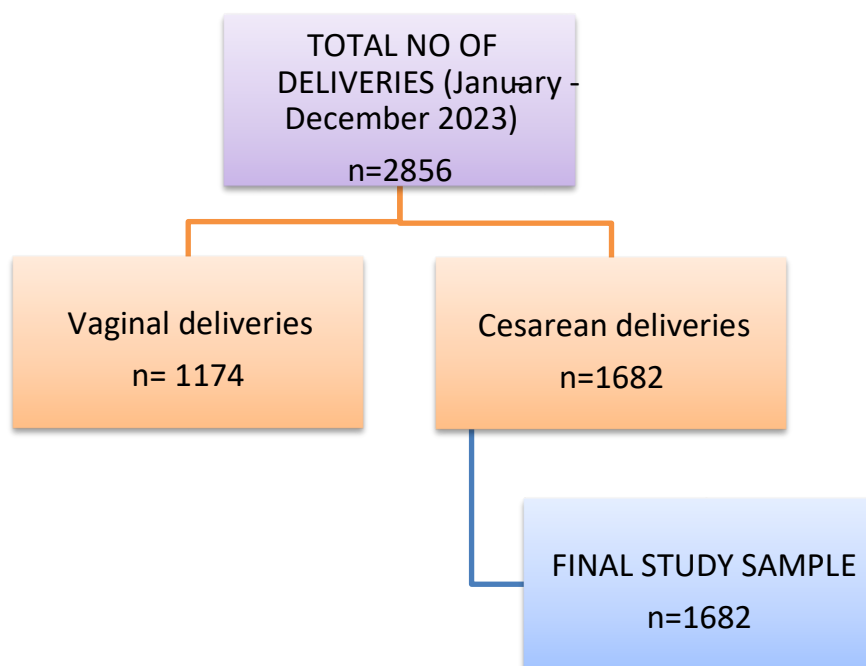


Figure 1:

Caesarean-section patients were categorized into 10 groups based on Robson's ten-group classification system, as shown below.

Table 1:

Groups	Clinical characteristics
1	Nulliparous, singleton, cephalic, >37 weeks, spontaneous labor
2	Nulliparous, singleton, cephalic, 37 weeks, induced labor or cesarean section before labor
3	Multiparous without previous cesarean section, singleton, cephalic, 37 weeks, spontaneous labor
4	Multiparous without previous cesarean section, singleton, cephalic, >37 weeks, induced labor or caesarean section before labor
5	Multiparous with prior cesarean section, singleton, cephalic, >37 weeks
6	All nulliparous breeches

7	All multiparous breeches (including previous cesarean section)
8	All multiple pregnancies (including previous cesarean section)
9	All pregnancies with transverse or oblique lie (including those previous cesarean section)
10	Singleton, cephalic, <36 weeks (including previous cesarean section)

All the statistical data is collected in an Excel spreadsheet and analyzed using SPSS software, version 25. Descriptive variables such as numbers and percentages (%) means \pm standard deviation (SD) presented. The chi-square test was used to analyze the statistical significance between the different Robson groups. A p value of < 0.05 is considered statistically significant.

Results:

Table 1: Distribution of Caesarean Sections by Different Subgroups of Ten Group Classification System

Robson's group	N	N1	N2
1	281	16.71%	9.83%
2	379	22.53%	13.27%
3	115	6.84%	4.03%
4	51	3.03%	1.78%
5	621	36.92%	21.75%
6	24	1.42%	0.84%
7	38	2.26%	1.34%
8	21	1.25%	0.73%
9	14	0.83%	0.49%
10	138	8.21%	4.83%

N = total number of Caesarean Sections in each group of Ten Group Classification System; N1 = contribution of each group to total CAESAREAN SECTIONS (%) = $N/\text{total CAESAREAN SECTIONS} \times 100$; N2 = contribution of each group to total birth (%) = $N/\text{total deliveries} \times 100$.

In this study, we found that the most common indication for caesarean section is group 5 (multiparous with prior CS, singleton, cephalic, ≥ 37 weeks) with the highest caesarean section rate of 36.92% (n=621) and 21.75% to all deliveries. The second most common indication for caesarean section is Group 2 (nulliparous, singleton, cephalic, ≥ 37 weeks, induced labour or CS before labour) with caesarean section rate of 22.53% (n=379) and 13.27% to all deliveries.

A total of 2856 deliveries were registered during the course of this study.

58.89% (n = 1682) of the registered deliveries underwent caesarean section in our institute.

Among them, 15.21% (n=256) underwent the caesarean sections electively and the remaining 84.79% (n=1426) had emergency caesarean sections.

The third most common indication for caesarean section is the group 1 (single cephalic nulliparous women at term and in spontaneous labour) with caesarean section rate of 16.71% and 9.83% of all deliveries. The least common indication for caesarean section is group 9 (Transverse lie/oblique lie) with a caesarean section rate of 0.83% (n=14) and 0.49% of overall deliveries. The remaining groups (groups 3, 4, 6, 7, 8, and 10) account for 23% (n= 401) of all caesarean section and 14% of overall deliveries.

The Chi-square analysis shows that the caesarean section rate was significantly higher in groups 5, 2, and 1 compared to other Robson groups with a p-value < 0.0001 , which shows that there is strong statistical significance.

Table 2: Indications for Caesarean Sections in Various Groups

Group 1	Foetal distress, Arrest of labour, CPD, APH
Group 2	Foetal distress, Arrest of labour, Failed induction
Group 3	Foetal distress, Arrest of labour, CPD, Transverse/oblique lie
Group 4	Fetal distress, Failed induction, CPD
Group 5	Previous 1 CS not suitable for VBAC, not willing for VBAC, With failed VBAC, Previous 2 or more CS
Group 6	Nulliparous breech
Group 7	Multiparous breech, Fetal distress
Group 8	Malpresentation, Previous CS
Group 9	Transverse lie/ oblique lie
Group 10	Fetal distress, Transverse/oblique lie, heart disease complicating pregnancy, Previous CS, Severe preeclampsia/eclampsia, APH

Discussion

Robson's classification, more often referred to as the 'Ten Group Classification System' came into existence in 2001. This system was endorsed by the World Health Organization in 2015 as a gold standard method to monitor the caesarean section rate. It comprises ten groups classified based on the basic obstetric data such as parity, mode of previous deliveries, previous caesarean section indications, gestational age, onset of labour, and spontaneous or induced labour. This helps in a clear understanding of various indications of caesarean section. Therefore, necessary preventive measures can be taken to minimize unnecessary caesarean sections.

The quality of maternal and child healthcare can be determined with the help of the caesarean section rate in the country. It also helps in assuring the safety of delivering mother and her child born during labour.

The main purpose of this study is to assess the caesarean section rate, and factors responsible for caesarean sections based on ROBSON's ten group classification system. There it helps to optimize the rate of caesarean section in our institute and also to signify the importance of ROBSON's ten-group classification system in restraining the caesarean section rate to define the various strategies to improve the quality and safety of maternal and child healthcare.

World Health Organization suggests that a caesarean section rate of more than 10% is in no way helpful in minimizing the maternal and perinatal mortality rate. Despite that, there is a significant risk of perioperative complications, prolonged hospital stay, delayed initiation of breastfeeding and early discontinuation of breastfeeding and cost burden to the healthcare system.

The caesarean section rate in our institution is 58.89%. This high caesarean section rate is mainly because our institution is the only Government tertiary care centre in the district which attends high-risk and complicated cases. This rate is purely the hospital section rate rather than the population section rate.

The most common indication for caesarean section is group 5 (multiparous with prior CS, singleton, cephalic, ≥ 37 weeks) with the highest caesarean section rate of 36.92%.

Among them multiparous with prior caesarean section is a major indication for the caesarean section which signifies the importance of vaginal birth after caesarean (VBAC) to minimize the repeat caesarean section rate in eligible women. The American College of Obstetricians and Gynecologists recommends VBAC as a safe and

most appropriate option for majority of the women with a previous history of caesarean section.

The other more common indications for caesarean sections are Group 1, 2, 3 and 10 (nulliparous, and singleton, cephalic, ≥ 37 weeks, induced labour or CS before labour). The primary caesarean section rate was much higher than that of the repeat caesarean section rate in our institute. The major reasons among the primary caesarean section group were fetal distress, failed induction, arrest of labour, and malpresentation.

Recommendations to reduce caesarean section rate:

1. If we can reduce the rate of primary caesarean section rate by adopting appropriate approaches for each indication, we can further reduce the rate of overall caesarean section. Induction of labour can be continued even after 24 hours with other methods if there are no maternal and foetal complications, so that caesarean section rate can be reduced.
2. We can follow labour care guidelines with continuous fetal monitoring by prolonging the duration of active first stage by 12 hours in nulliparous and 10 hours in multigravidas unlike previous conventional guidelines. In second stage duration is prolonged to 3 hours in nulligravidas and 2 hours in multiparas.
3. Recently few studies reported that maternal preference due to fear of labour pains and superstition in auspicious time delivery were further increasing the rate of caesarean section. Proper counselling should be done to reduce the fear of labour pains, companionship and proper antenatal exercises for labour. This thereby minimizing its complications and also reducing the cost burden on the healthcare system.

Conclusion

Robson Ten group classification system is a very simple and easy system to identify the high-risk groups responsible for upward trends of caesarean section. This helps us to implement new strategies to reduce caesarean section rates.

"Caesarean section rates should no longer be thought of as being too high or too low, but rather whether they are appropriate or not, after taking into consideration all the relevant information" Dr Michael Robson. Therefore, it is our responsibility to educate and counsel mothers to avoid unnecessary caesarean sections.

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