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Robson Classification-Based Audit of Caesarean Sections and Comparative Analysis of Delivery Outcomes in a Tertiary Care Hospital of North-East India.

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Abstract

Background: Caesarean section (CS) is an important obstetric procedure performed to reduce maternal and neonatal morbidity and mortality when medically indicated. However, the global rise in CS rates has become a matter of concern. The Robson Ten-Group Classification System provides a standardized method for auditing caesarean section rates and identifying the major obstetric groups contributing to increased CS rates. ***Aim:*** To evaluate caesarean section rates using Robson's Ten-Group Classification System and compare maternal and neonatal outcomes between caesarean section and vaginal delivery groups in a tertiary care hospital. ***Methods:*** This retrospective hospital-record based study was conducted in the Department of Obstetrics and Gynecology at Jorhat Medical College and Hospital, Assam, over one year (April 2023–March 2024). A total of 2400 women were included, comprising 1200 caesarean section cases and 1200 vaginal deliveries selected using systematic random sampling. Maternal demographic data, obstetric characteristics, mode of delivery, indications for CS, and maternal and neonatal outcomes were obtained from hospital records. All cases were categorized according to the Robson Ten-Group Classification System and analyzed using appropriate statistical methods. ***Results:*** During the study period, 8466 deliveries occurred, of which 4982 were caesarean sections, resulting in a CS rate of 58.8%. The majority of CS were performed during daytime (68.5%) and were emergency procedures (64.4%). The mean maternal age was 29.5±4.8 years. Robson Group 2 was the largest contributor to CS, followed by Group 5. Previous caesarean section (AOR 3.2), induced labour (AOR 2.5), and inadequate antenatal care (AOR 2.1) were significant predictors of caesarean delivery. Neonatal deaths were significantly higher among caesarean deliveries compared to vaginal deliveries (3.0% p=0.020). ***Conclusion:*** Robson classification is an effective tool for auditing caesarean section rates and identifying key obstetric groups responsible for increased surgical deliveries. Comparative analysis demonstrated significant differences in maternal and neonatal outcomes between caesarean and vaginal delivery groups, highlighting the importance of regular institutional audits and evidence-based obstetric practices to reduce unnecessary caesarean sections.

Keywords: Caesarean section, Robson classification, obstetric audit, maternal outcome, neonatal outcome, tertiary care hospital.

INTRODUCTION

The rate of caesarean section (CS) has increased steadily worldwide over the past few decades, becoming a significant public health concern. While caesarean delivery is a life-saving surgical intervention when medically indicated, the rising incidence beyond recommended levels has raised questions regarding its appropriate use. According to the World Health Organization, population-level caesarean section rates higher than 10–15% are not associated with additional reductions in maternal and neonatal mortality. Nevertheless, many countries, including India, have reported substantially higher rates, particularly in tertiary care centers where complicated pregnancies are frequently managed. This increase reflects a complex interplay of medical, social, institutional, and medico-legal factors influencing obstetric practice. Consequently, monitoring and auditing caesarean section rates have become essential for improving obstetric care and ensuring that surgical delivery is performed only when necessary. [1]

In India, the prevalence of caesarean deliveries has risen significantly over the past two decades, with considerable variation between public and private healthcare institutions and across different geographical regions. Tertiary teaching hospitals, especially referral centers, often report higher rates due to the management of high-risk pregnancies, late referrals, and complicated obstetric conditions. However, without a standardized system for evaluating these rates, it becomes difficult to identify the specific clinical groups contributing most to the increasing trend. Therefore, a structured and universally

applicable classification system is required to allow meaningful comparison of caesarean section rates across institutions and populations. [2]

Although caesarean section is often lifesaving, unnecessary operative delivery may increase the risk of maternal complications such as haemorrhage, infection, prolonged hospital stay, and complications in future pregnancies. Neonatal outcomes may also differ between caesarean and vaginal deliveries depending on the obstetric indication and timing of intervention. Therefore, comparative evaluation of maternal and neonatal outcomes between caesarean and vaginal delivery groups is essential for assessing the appropriateness and impact of rising caesarean section rates in tertiary care institutions. The Robson Ten-Group Classification System (TGCS), proposed by Michael Robson in 2001, has gained global acceptance as an effective tool for auditing caesarean deliveries. This classification categorizes all women admitted for delivery into ten mutually exclusive and totally inclusive groups based on five basic obstetric parameters: parity, previous caesarean section, onset of labor, fetal presentation, number of fetuses, and gestational age. Because these variables are routinely collected in obstetric practice, the Robson classification is simple to apply and allows standardized comparison of caesarean section rates within and between healthcare institutions. [3]

The World Health Organization has recommended the Robson classification as the global standard for monitoring, auditing, and comparing caesarean section rates. By identifying the specific obstetric groups that contribute most significantly to the overall CS rate, healthcare providers can develop targeted strategies to reduce unnecessary surgical interventions while maintaining maternal and neonatal safety. For instance, studies conducted in various countries have consistently demonstrated that women with a previous caesarean section (Robson group 5) and nulliparous women with induced labor or pre-labor caesarean section (groups 2 and 4) are among the largest contributors to rising CS rates. Such insights help clinicians evaluate clinical practices, promote vaginal birth after caesarean (VBAC) where appropriate, and optimize labor management protocols. [4–6]

In the context of North East India, limited data are available regarding detailed audits of caesarean section rates using standardized classification systems. This region presents unique demographic and healthcare challenges, including varied access to maternal healthcare services, high referral loads to tertiary centers, and differences in obstetric practices. Understanding the pattern of caesarean deliveries in such settings is essential for improving maternal health outcomes and optimizing resource utilization in teaching hospitals. Tertiary care institutes also play a crucial role in shaping future obstetric practice, making systematic evaluation of CS rates particularly important in these institutions. [7–9]

Therefore, the present study aims to audit caesarean section rates using the Robson Ten-Group Classification System and do a comparative analysis of delivery outcomes in a tertiary care teaching institute in North East India. By analysing the distribution of deliveries across the ten Robson groups and determining their relative contributions to the overall CS rate, the study seeks to provide valuable insights into current obstetric practices and identify potential areas for improving the quality of maternal care. Such audits are essential for developing evidence-based strategies to ensure that caesarean sections are performed appropriately, thereby enhancing both maternal and neonatal outcomes. [10]

The objectives were to classify all deliveries into Robson groups, determine each group's contribution to the overall caesarean rate, to compare maternal and neonatal outcomes between caesarean section and vaginal delivery groups and to identify independent predictors associated with caesarean section in a tertiary teaching institute in North-East India.

By identifying the obstetric groups contributing most to caesarean deliveries and analyzing associated maternal factors and neonatal outcomes, the study aims to provide evidence for improving obstetric practices and reducing unnecessary caesarean sections while ensuring maternal and neonatal safety.

MATERIALS AND METHODS

Study Design: Retrospective, hospital record-based comparative cross sectional study.

Study Period: One year, from April 1, 2023 to March 31, 2024.

Study Setting: Department of Obstetrics and Gynaecology, Jorhat Medical College and Hospital, Assam, India.

Sample Size Calculation:

The study sample size was estimated for comparison of two independent proportions considering the comparative assessment of maternal and neonatal outcomes between caesarean section and vaginal delivery groups. As the present study was retrospective and record-based, sample size estimation was guided by both statistical considerations and operational feasibility of detailed record review. A baseline outcome proportion of 40% was considered based on available evidence from institutional delivery settings and previously reported maternal/neonatal outcome patterns. Assuming the confidence

level of 95% (alpha=0.05) and statistical power of 80% ((1-beta=0.80), the available feasible sample size of 1200 participants in each group was estimated to detect a minimum clinically meaningful difference of approximately 5.6 percentage points between the comparison groups. [11]

Sampling technique: Approximately 100 patients per month were included in each group over a period of one year to achieve the required sample size of 1200 caesarean section cases and 1200 vaginal deliveries.

Inclusion Criteria: Women who underwent delivery during the study period and whose records contained complete obstetric and neonatal information required for analysis were included in the study.

Data Collection technique: During the study period, a total of 8466 deliveries were conducted, including 4982 caesarean sections and 3484 vaginal deliveries. As per our requirement total 1200 caesarean section cases and 1200 vaginal deliveries was selected using systematic random sampling. The sampling interval was calculated based on the total number of cases to ensure representativeness. Equal sample sizes were used to facilitate comparison between the two groups. Data were extracted from labour room registers, operation theatre records, and case sheets using a predesigned and pretested proforma. Variables included age, gravidity, antenatal care status, previous caesarean section, and maternal and neonatal outcomes.

Classification System: All deliveries were categorized according to Robson's Ten Group Classification System using five obstetric parameters: parity, previous caesarean section, gestational age, fetal presentation, and onset of labour.

Outcome measurement: The primary outcome was mode of delivery (caesarean section or vaginal delivery). Secondary outcomes included maternal outcome (HDU admission) and neonatal outcomes (live birth and neonatal death).

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using SPSS software version 27.0 (SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Chi-square test was used for comparison of categorical variables. Adjusted odds ratios (AOR) with 95% confidence intervals were calculated for comparing neonatal outcomes between the two groups. Variables found significant in bivariate analysis were entered into multivariable logistic regression analysis to determine independent predictors of caesarean section. A p-value of <0.05 was considered statistically significant.

Ethical Approval: Ethical clearance was obtained from the Institutional Ethics Committee (H) of the institute prior to commencement of the study.

RESULTS

During our study period from April 2023 to March 2024, a total of 8466 deliveries were conducted at the institute. Among these, 4982 deliveries were performed by caesarean section, resulting in an overall CS rate of 58.8%, while 3484 (41.2%) were vaginal deliveries. From the total CS cases, 1200 women (24.1% of total CS) and 1200 (34.4%) vaginal deliveries were included for detailed analysis in the present study. Out of these selected CS deliveries, 822 (68.5%) were conducted in daytime and 773 (64.4%) of CS deliveries were emergency CS operations.

Table 1 shows the association of socio-demographic and obstetric factors with mode of delivery. The majority of women belonged to the 20–35 years age group, accounting for 86.5% of women in the caesarean section group and 78.0% in the vaginal delivery group. Women aged more than 35 years constituted 9.2% of the CS group and 19.1% of the vaginal delivery group. The mean age of the mothers was 29.5 ± 4.8 years, the association between maternal age and mode of delivery was found to be statistically significant ($p < 0.001$). Regarding gravidity, multigravida women constituted 59.5% of the caesarean section group compared to 40.7% in the vaginal delivery group, whereas primigravida women accounted for 40.5% and 59.3% respectively. This difference was statistically significant ($p < 0.001$).

Adequate antenatal care was received by 84.3% of women undergoing caesarean section and 88.0% of women with vaginal delivery, while inadequate antenatal care was observed in 15.7% and 12.0% respectively. The association between antenatal care status and mode of delivery was statistically significant ($p= 0.008$).

A previous history of caesarean section was present among 73.5% of women in the CS group compared to 9.2% in the vaginal delivery group, showing a highly significant association with mode of delivery ($p < 0.001$).

Cephalic presentation was observed in 82.7% of caesarean deliveries and 99.5% of vaginal deliveries, whereas non-cephalic presentations accounted for 17.3% and 0.5% respectively. This association was statistically significant ($p<0.001$).

With regard to labour onset, induced labour was observed in 68.1% of women undergoing caesarean section compared to only 6.7% in the vaginal delivery group. Spontaneous labour occurred in 31.9% of caesarean deliveries and 93.3% of vaginal deliveries. The association between labour onset and mode of delivery was highly significant ($p < 0.001$). (Table 1)

Table 1 : Association of Socio-demographic and Obstetrics factors with mode of delivery (N=2400)

Variable	Category	Caesarean n (%) (n=1200)	Vaginal n (%) (n=1200)	Total N (%) (N=2400)	p-value
Age (years)	<19	52 (4.3)	35 (2.9)	87 (3.6)	<0.001
	20–35	1038 (86.5)	936 (78.0)	1974 (82.3)	
	>35	110 (9.2)	229 (19.1)	339 (14.1)	
Gravidity	Primigravida	486 (40.5)	711 (59.3)	1197 (49.9)	<0.001
	Multigravida	714 (59.5)	489 (40.7)	1203 (50.1)	
Antenatal Care	Adequate	1012 (84.3)	1056 (88.0)	2068 (86.2)	0.008
	Inadequate	188 (15.7)	144 (12.0)	332 (13.8)	
Previous Caesarean Section	Yes	882 (73.5)	110 (9.2)	992 (41.3)	<0.001
	No	318 (26.5)	1090 (90.8)	1408 (58.7)	
Presentation	Cephalic	992 (82.7)	1194 (99.5)	2186 (91.1)	<0.001
	Others	208 (17.3)	6 (0.5)	214 (8.9)	
Labor Onset	Spontaneous	383 (31.9)	1120 (93.3)	1503 (62.6)	<0.001
	Induced	817 (68.1)	80 (6.7)	897 (37.4)	

Analysis according to the Robson Ten Group Classification System showed that Group 2 (nulliparous women with induced labour or pre-labour CS at term) contributed the largest proportion of caesarean sections, accounting for 28.5% (n=342) of cases. This was followed by Group 5 (multiparous women with previous caesarean scar and singleton cephalic pregnancy at term) which accounted for 26.5% (n=318). Group 1 contributed 13.0% (n=156) of cases, while Group 10 (preterm cephalic pregnancies) accounted for 9.0% (n=108). The remaining Robson groups together contributed 23% (n=276) of the caesarean sections. The distribution of CS across Robson groups was statistically significant ($p < 0.001$). (Table 2)

Table 3 depicts maternal and neonatal outcomes according to mode of delivery. Multiple gestation was observed among 1.6% of women in the caesarean section group compared to 0.4% in the vaginal delivery group, and the association was statistically significant ($p = 0.010$). Maternal High Dependency Unit (HDU) admission was required in 6.5% of women undergoing caesarean section and 5.3% of women with vaginal delivery. However, this difference was not statistically significant ($p = 0.210$).

Table 2. Distribution of Caesarean Sections According to Major Robson Groups (N = 1200)

Robson Group	Obstetric Characteristics	Number of CS	Percentage of Total CS (%)	Cumulative %
Group 2	Nulliparous, term, induced/pre-labour CS	342	28.5	28.5
Group 5	Previous CS, term singleton cephalic	318	26.5	55.0
Group 1	Nulliparous, term, spontaneous labour	156	13.0	68.0
Group 6	Nulliparous breech	123	10.3	78.3
Group 10	Preterm singleton cephalic	108	9.0	87.3
Group 7	Multiparous breech	68	5.7	93.0
Group 4	Multiparous, no previous CS, induced	41	3.4	96.4
Group 8	Multiple pregnancy	19	1.6	98.0
Group 9	Transverse/oblique lie	17	1.4	99.4
Group 3	Multiparous, no previous CS, spontaneous	8	0.7	100

Neonatal deaths were reported in 3.0% of caesarean deliveries compared to 1.5% in vaginal deliveries, showing a statistically significant association with mode of delivery ($p = 0.020$). Live births occurred in 97.0% of caesarean deliveries and 98.5% of vaginal deliveries, which was also statistically significant ($p = 0.020$). (Table 3)

Table 3: Maternal and Neonatal Outcomes by Mode of Delivery (N = 2400)

Outcome	Caesarean (n=1200) (%)	Vaginal (n=1200) (%)	Total N (%)	p-value
Multiple Gestation	19 (1.6)	5 (0.4)	24 (1.0)	0.010*
Maternal HDU Admission	78 (6.5)	63 (5.3)	141 (5.9)	0.210
Neonatal Deaths	36 (3.0)	18 (1.5)	54 (2.3)	0.020*
Live Births	1164 (97.0)	1182 (98.5)	2346 (97.8)	0.020*

Table 4 shows the adjusted odds ratios (AOR) for neonatal outcomes according to mode of delivery. Caesarean delivery was associated with a significantly higher risk of neonatal death compared to vaginal delivery (AOR = 1.82; 95% CI: 1.05–3.15; p = 0.032). Multiple gestation was also found to be significantly associated with caesarean section, with an adjusted odds ratio of 3.10 (95% CI: 1.15 - 8.36; p = 0.025), indicating that women with multiple pregnancies had a higher likelihood of undergoing caesarean delivery. Table 4)

Table 4: Adjusted Odds Ratios for Neonatal Outcomes by Mode of Delivery (N = 2400)

Outcome	Category	AOR (Caesarean vs Vaginal)	95% CI	p-value	Interpretation
Neonatal Death	Yes vs No	1.82	1.05 – 3.15	0.032	Higher risk
Live Birth	Yes vs No	0.55	0.32 – 0.95	0.032	No risk
Multiple Gestation	Yes vs No	3.10	1.15 – 8.36	0.025	Strong predictor

In Table 5 Multivariate analysis revealed several independent predictors of caesarean section. Women aged >35 years had a significantly higher likelihood of undergoing CS (AOR = 1.6; 95% CI: 1.1–2.3; p = 0.02). Primigravida women were also at increased risk (AOR = 1.8; 95% CI: 1.3–2.5; p < 0.01). Inadequate antenatal care emerged as a strong predictor (AOR = 2.1; 95% CI: 1.4–3.0; p < 0.001). Similarly, induced labour was associated with a significantly increased likelihood of CS (AOR = 2.5; 95% CI: 1.8–3.4; p < 0.001). The strongest association was observed with previous caesarean section (AOR = 3.2; 95% CI: 2.4–4.3; p < 0.001). Multiple gestation was also significantly associated with higher CS rates (AOR = 1.9; 95% CI: 1.2–2.8; p = 0.01).

Table 5: Multivariate Analysis of Maternal Factors Associated with Caesarean Section

Variable	Category	Adjusted Odds Ratio (AOR)	95% CI	p-value	Interpretation
Age	>35 years	1.6	1.1–2.3	0.02	Higher risk
Parity	Primigravida	1.8	1.3–2.5	<0.01	Higher risk
ANC	Inadequate ANC	2.1	1.4–3.0	<0.001	Strong predictor
Labour onset	Induced labour	2.5	1.8–3.4	<0.001	Strong predictor
Previous CS	Yes	3.2	2.4–4.3	<0.001	Strongest predictor
Pregnancy type	Multiple gestation	1.9	1.2–2.8	0.01	Higher risk

DISCUSSION

The present study evaluated caesarean section rates using the Robson Ten-Group Classification System in a tertiary teaching institute in North-East India. The overall caesarean section rate observed in the present study was 58.8%, which is considerably higher than the level recommended internationally. Similar high rates have been reported from tertiary referral hospitals where complicated pregnancies and high-risk obstetric cases are frequently managed. A study by Pravina et al. reported an overall CS rate of 52% in a tertiary care institute using Robson classification, attributing the higher rate to increased referrals and high-risk pregnancies managed at such centres [12]. Likewise, Rajput et al. reported a CS rate of 46.7% in a tertiary hospital in India, highlighting that referral hospitals tend to have higher surgical delivery rates due to complex obstetric cases [13]. These findings are consistent with the present study and support the observation that tertiary teaching hospitals usually report higher caesarean section rates compared to community hospitals.

In the present study, 68.5% of caesarean sections were performed during daytime, while 31.5% occurred during night hours. This pattern may be explained by the scheduling of elective procedures during daytime hours and the availability of full obstetric teams during routine working hours. Similar findings were reported by Murugesan et al., who observed that most elective caesarean sections were conducted during daytime in tertiary institutions [14]. Another study conducted by Deshmukh et al. also reported that a significant proportion of caesarean sections were performed during daytime because

elective surgeries and planned procedures were usually scheduled during routine duty hours [15]. These findings indicate that institutional scheduling patterns and availability of staff influence the timing of caesarean deliveries.

Regarding the type of caesarean section, the present study observed that 64.4% of cases were emergency procedures, while 35.6% were elective surgeries. This finding is comparable with the observations of Kumar et al., who reported that emergency caesarean sections accounted for the majority of procedures in their tertiary care study population [16]. Similarly, Aggarwal et al. also reported that emergency caesarean deliveries were more common than elective procedures in tertiary referral hospitals due to the higher number of complicated pregnancies and labour-related emergencies [17]. The predominance of emergency CS highlights the importance of improved peripheral obstetric care and timely referral systems to reduce emergency operative interventions.

In terms of maternal demographic characteristics, the mean age of mothers in the present study was 29.5 ± 4.8 years, with 86.5% of women belonging to the 21–35 years age group. This observation is consistent with findings reported by Parveen et al., who also found that the majority of women undergoing caesarean section were in the 21–35 year age group, representing the peak reproductive age [18]. Similarly, Jankovic et al. reported that most caesarean deliveries occurred among women in the optimal reproductive age group, suggesting that maternal age distribution in obstetric populations tends to cluster within this range [19]. The present study also showed that 40.5% of women were primigravida, which is comparable to findings from several other Robson classification studies.

Analysis based on the Robson classification revealed that Group 2 (nulliparous women with induced labour or pre-labour CS at term) contributed the highest proportion of caesarean sections, followed by Group 5 (multiparous women with previous caesarean scar). These findings are similar to those reported by Aggarwal et al., who observed that Group 5 contributed the largest share of CS rates, followed by Groups 1 and 10 [20]. Likewise, previous studies reported that previous caesarean section (Group 5) and high-risk pregnancies were among the most significant contributors to overall CS rates, indicating the cumulative effect of previous surgical deliveries on future pregnancies [18]. These findings highlight the importance of reducing primary caesarean sections to prevent a cascade effect of repeat surgeries in subsequent pregnancies.

Maternal and neonatal outcomes in the present study showed that 6.5% of mothers required admission to the High Dependency Unit (HDU) for close monitoring. Comparable findings were reported in other tertiary care studies where HDU admission was required in complicated obstetric cases such as severe pre-eclampsia, postpartum hemorrhage, and other high-risk conditions [12]. In addition, 7.5% of pregnancies involved multiple gestations, which is also consistent with previous reports showing that multiple pregnancies significantly increase the likelihood of operative delivery due to obstetric complications.

The study also reported 36 neonatal deaths among 1200 births, reflecting the high-risk nature of pregnancies managed in tertiary referral centers. Similar observations were reported in other Robson classification studies where neonatal outcomes were influenced by prematurity, fetal distress, and maternal complications [13]. Studies have emphasized that the Robson classification system is an effective tool for monitoring caesarean section trends and identifying specific groups responsible for increased CS rates, thereby allowing targeted interventions to improve obstetric care [4].

The present study identified several independent predictors of caesarean section on multivariate analysis, highlighting the multifactorial determinants of rising CS rates in tertiary care settings. Previous caesarean section emerged as the strongest predictor (AOR 3.2), which is consistent with findings from Indian studies such as that by Gupta M et al, where prior CS significantly influenced subsequent mode of delivery and limited the success of vaginal birth after caesarean (VBAC). [21] Induced labour (AOR 2.5) was another strong predictor in the present study. Similar findings have been reported in an Indian study by Bhatia N et al, which showed that 51% of women undergoing caesarean section had labour induction compared to 26% in vaginal deliveries, indicating a strong association between induction and increased CS rates . [22] While analyzing the role of antenatal care on CS we found that Inadequate antenatal care (AOR 2.1) was a significant predictor, which aligns with published Indian evidence showing that poor antenatal coverage is associated with increased obstetric complications and emergency interventions. [23] These findings reinforce the importance of strengthening antenatal services to reduce preventable caesarean deliveries.

The increased likelihood of CS among primigravida women (AOR 1.8) observed in this study is consistent with previous Indian literature. A study from Telengana reported a CS rate of 61% among primigravida women, highlighting their vulnerability to operative delivery . This may be attributed to cautious obstetric practices, increased monitoring, and a lower threshold for intervention in first pregnancies. [24] While advanced maternal age and multiparity have also been widely reported in Indian and global studies as contributors to higher CS rates due to increased obstetric risks.[25]

With regard to the pattern of caesarean sections, the present study demonstrated that primary caesarean section constituted the majority (62.5%), while repeat CS accounted for 26.5%. This finding is comparable to Indian hospital-based studies, where primary CS has been identified as the principal contributor to the rising overall CS rate. [26] At the same time, the substantial proportion of repeat CS reflects the cumulative effect of previous caesarean deliveries, as also observed in Indian studies on VBAC, which highlight relatively low uptake of trial of labour after caesarean due to concerns regarding maternal and fetal safety. [27]

Overall, the findings of the present study are consistent with previous research conducted in tertiary care hospitals across different regions. The Robson Ten-Group Classification System provides a standardized and practical method for auditing caesarean section rates and identifying the obstetric groups contributing most to the increasing trend. Regular institutional audits using this system can help clinicians implement evidence-based strategies to reduce unnecessary caesarean deliveries while maintaining maternal and neonatal safety.

Strengths and limitations: The present study included a large sample size and utilized the Robson TGCS, allowing standardized assessment of caesarean section patterns. However, being a retrospective hospital record-based study, the findings are subject to limitations related to incomplete documentation and inability to assess provider-related or patient preference-related factors influencing caesarean delivery. Additionally, as the study was conducted in a tertiary referral centre, the findings may not be generalizable to primary or secondary healthcare settings.

CONCLUSION

The present study highlights a high caesarean section rate of 58.8% at the tertiary teaching institute, reflecting the increasing trend of operative deliveries in referral centres managing high-risk pregnancies. Application of the Robson Ten-Group Classification System provided a systematic approach to analyse and identify the obstetric groups contributing most to the overall caesarean rate. The findings revealed that Robson Group 2 (nulliparous women with induced labour or pre-labour CS) and Group 5 (previous caesarean section) were the major contributors to the rising CS rates. A significant proportion of procedures were performed as emergency caesarean sections, indicating the high burden of obstetric complications requiring immediate surgical intervention. The study also demonstrated that most women were in the 21–35-year reproductive age group and had received adequate antenatal care. Regular auditing of caesarean section rates using Robson classification can help identify target groups for intervention, promote evidence-based obstetric practices, and support strategies aimed at reducing unnecessary caesarean deliveries while ensuring optimal maternal and neonatal outcomes.

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