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Original Research Article

Analysis of Trends of Cesarean Section According to Robson's Ten Group Classification at DMCH, Darbhanga

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Abstract

Background: Cesarean section (CS) rates are rising worldwide, often exceeding the WHO-recommended 10–15%. The Robson Ten Group Classification System (RTGCS) provides a standardized, women-based method to audit and compare CS rates.

Aim: To analyze CS trends at Darbhanga Medical College & Hospital (DMCH) using RTGCS and identify major contributing groups.

Methods: A hospital-based prospective observational study was conducted in the Department of Obstetrics & Gynecology, DMCH, from March 2024 to June 2025. All women undergoing CS beyond 28 weeks' gestation were included and categorized as per RTGCS. Demographic data, obstetric variables, indications for CS, and fetomaternal outcomes were recorded and statistically analyzed.

Results: Out of 6,293 deliveries, 3,207 were CS, with an incidence of 50.96%. The highest contributor was Group 5 (previous CS, singleton, cephalic, ≥37 weeks) – 31.8%, followed by Group 1 (nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labor) – 25.1%, and Group 3 – 13.8%. Fetal distress was the leading indication in primary CS (60.4% in RG-1), while previous scar with scar tenderness was predominant in RG-5. Malpresentations (RG-6, 7, 9) and preterm cephalic pregnancies (RG-10) also contributed significantly. Most patients (82.1%) were from rural areas, 89.7% were unbooked, and 71.3% were referred. Post-CS complications occurred in 31.8% cases, with surgical site infection being most common (16.4%).

Conclusion: RTGCS is an effective audit tool for monitoring CS trends. The high contribution of Groups 1 and 5 indicates a need to reduce primary CS and promote VBAC where appropriate. Addressing malpresentations, improving labor management, and strengthening family planning counselling during CS can help rationalize CS rates. Routine use of RTGCS in audits is recommended to ensure safe, evidence-based obstetric practice.

Keywords: Cesarean section, Robson classification, VBAC, fetal distress, obstetric audit.

Introduction

Cesarean section (CS) is a life-saving surgical procedure that involves the delivery of the fetus through incisions in the abdominal and uterine walls. Although initially reserved for strictly obstetric emergencies, its indications have broadened over time, leading to a significant rise in global CS rates. The earliest record of a cesarean dates back to 1020 AD, and since then, medical and surgical advancements have greatly enhanced the safety and accessibility of the procedure. [1] Despite the known maternal and neonatal risks associated with unnecessary cesarean deliveries—including infections, hemorrhage, thromboem bolism, and complications in future pregnancies—CS rates continue to escalate. In India, recent reports indicate a growing trend in both public and private healthcare sectors, often surpassing the World Health Organization's recommended threshold of 10–15%. This rising trend poses serious public health and economic concerns. [2-4] several factors contribute to the increase in cesarean rates, including improved access to anesthesia and surgical facilities, better fetal surveillance technologies, medico-legal pressures, maternal preference, and a rise in high-risk pregnancies due to advanced maternal age, obesity, and assisted reproductive technologies. However, the absence of a standardized system for

monitoring and evaluating the use of cesarean delivery has limited our ability to implement effective interventions. [5-7] To address this gap, the Robson Ten Group Classification System (RTGCS) was developed as a globally accepted, standardized, and reproducible method to assess, monitor, and compare CS rates across different settings. This classification categorizes women into ten distinct groups based on key obstetric characteristics: parity, previous cesarean section, onset of labor, gestational age, fetal presentation, and number of fetuses. The system is endorsed by the WHO and has proven useful in identifying the primary drivers of CS rates and in guiding evidence-based interventions.

Given the rising number of cesarean deliveries observed at our institution, this study aims to analyze CS trends using the Robson classification at Darbhanga Medical College and Hospital (DMCH), Darbhanga. By evaluating CS rates across the ten Robson groups, we seek to identify the major contributors to overall CS frequency, uncover areas for clinical improvement, and provide recommendations for optimizing obstetric care.

Materials and Methods

Design of Study- Hospital based Prospective observational study

Place of Study: Labour Room Department of Obstetrics and Gynaecology. Darbhanga Medical College & Hospital, Darbhanga, Bihar.

Period of Study: 1.5years

Study Population: All gravid patients admitted in the emergency (labour room) Department of Gynaecology and Obstetrics of Darbhanga Medical College & Hospital, Darbhanga, Bihar

Sample Size - 195 required sample size calculated according to the formula-

$n = z^2p(1-p)/e^2$

n is the requisite sample size.

Z = confidence level at 95%, with a standard value of 1.96.

P = anticipated prevalence of Caesarean section (Rate of Caesarean section- 15%) [4]

E = margin of error at 5%

SAMPLING METHOD- All the patients undergoing Caesarean section at the labour room DMCH fulfilling the inclusion criteria will be included in the study after taking proper consent.

Calculating Standard Error (SE) according to the formula

SE=√p(1-p)\n

p=0.15(prevalence=15%)

n=195(sample size)

SE=2.56%

Selection Criteria

Inclusion Criteria: Following pregnant females are included in the study

1. Informed consent for LSCS
2. Gestational age more than 28 weeks

Exclusion Criteria

1. Patient who can be taken for instrumental/or normal vaginal delivery for maternal or fetal indication
2. Congenitally anomalous baby
3. Patients who have refused LSCS.
4. APH and Sepsis
5. Maternal medical disorders complicating pregnancy.

Study Tools and Data Analysis: All the subject data were collected in the standardized data collection form and using data registers (ERO register).

Data was entered in MS-Excel sheet and analyzed using SPSS Version 20. Appropriate statistical test was applied according to qualitative and quantitative data. P-values below 0.05 were regarded as statistically significant.

Results

Total deliveries in the study period of March 2024 to june 2025 were 6293, out of which and total LSCS were 3207. The incidence rate in the study period is 50.96%. The highest rate was seen in the month of October 2024 (58.1%).

Table 1: Summary of total deliveries and total CS

Month	Total deliveries	Total CS	Percentage of CS deliveries
Mar-24	323	150	46.4%
Apr-24	301	161	53.4%
May-24	424	190	44.8%
Jun-24	290	166	57.2%
Jul-24	348	192	55.1%
Aug-24	357	171	47.8%

Sep-24	372	199	53.4%
Oct-24	620	360	58.1%
Nov-24	682	365	53.1%
Dec-24	293	129	44.0%
Jan-25	313	150	47.9%
Feb-25	453	218	48.1%
Mar-25	360	177	49.1%
Apr-25	407	186	45.7%
May-25	345	178	51.5%
Jun-25	405	225	55.5%

In the present study, total 195 cases were studied, and results have been prepared in the table forms and graph as given below.

Table 2: Distribution of age group of patients in the study

Age	Frequency	Percentage	95% CI
<20 Years	14	7.2%	4.1% - 12.0%
20-30 Years	148	75.9%	69.2% - 81.6%
>30 Years	33	16.9%	12.1% - 23.1%

The majority of the participants were aged 20-30 Years. While 16.9% of the participants had age: >30 Years and 7.2% of the participants had Age: <20 Years. The mean age of the population was 26.15 years. Robson Group 1 had maximum patients age <20 years (78.6%), while Robson Group 5 had 38.5% patients in the 20-30 years age group, while no patients in this group were aged <20 years.

Regarding the distribution of Robson's Group, there were notable differences among the different groupings. ($\chi 2 = 43.217$, p= <0.001).

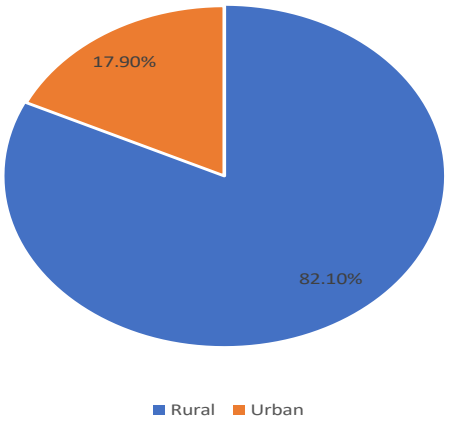

Figure 1: Distribution of the Participants in Terms of Household

82.1% of the participants had rural household. 17.9% of the participants had urban household

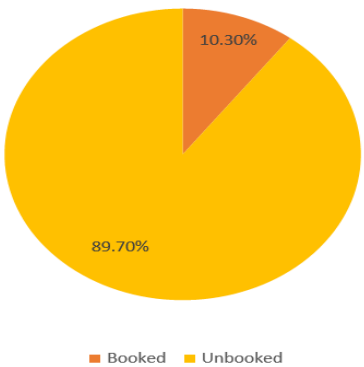

Figure 2: Distribution of the Participants in Terms of ANC Booking

10.3% of the participants had ANC Booking. 89.7% of the participants were unbooked cases.

Table 3: Distribution of the Participants in Terms of Referral

Referral	Frequency	Percentage	95% CI
Yes	139	71.3%	64.3% - 77.4%
No	56	28.7%	22.6% - 35.7%

71.3% of the participants were cases referred to our hospital while 28.7% of the participants did not have referral.

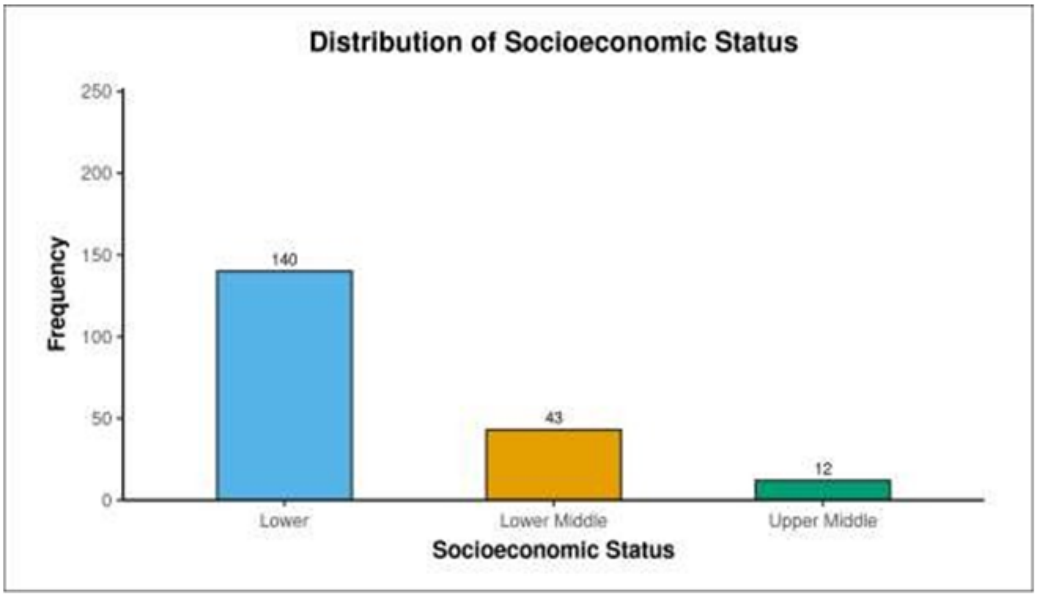

Figure 3: Distribution of the Participants in Terms of Socioeconomic Status

71.8% of the participants belonged to the lower socioeconomic class, while 22.1% of the participants had lower-middle Socioeconomic Status. 6.2% of the participants had Upper Middle Socioeconomic Status. None of the participants belonged to the upper socioeconomic group.

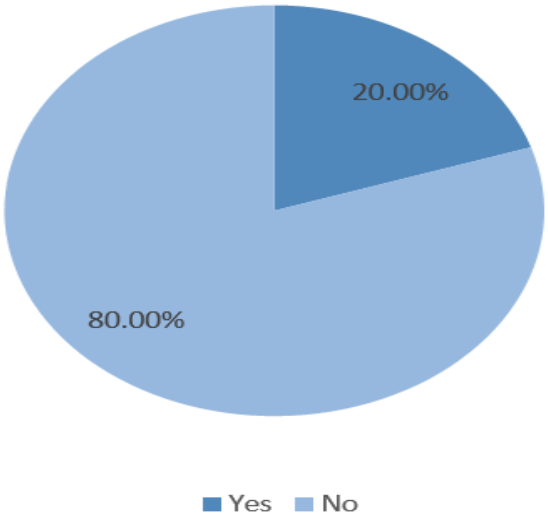

Figure 4: Distribution of the Participants in Terms of History of Previous Abortion

80.0% of the participants did not have History of Previous Abortion while only 20.0% of the participants had a History of Previous Abortion.

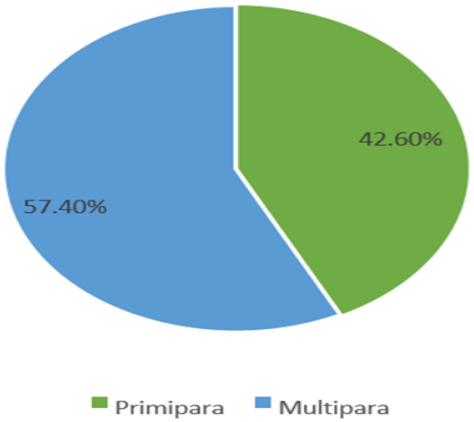

Figure 5: Distribution of the Participants in Terms of Parity

57.9% patients were multiparas while 42.1% patients had their first term pregnancy.

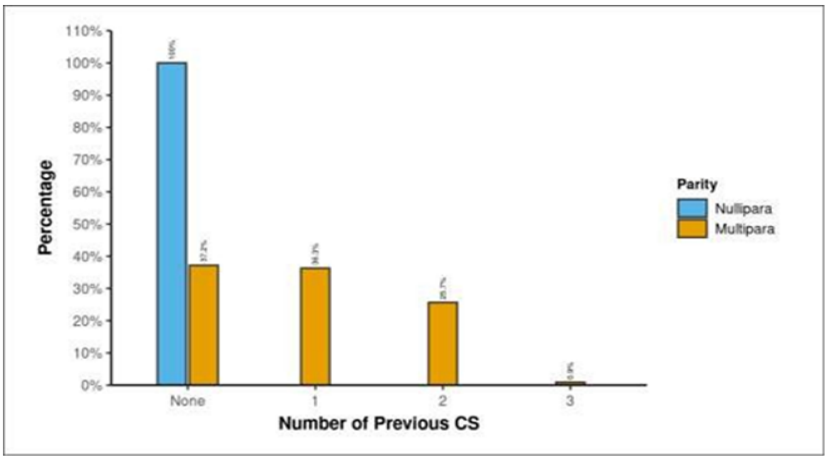

Figure 6: Association between Parity and Number of Previous CS (n = 195)

The distribution of the number of previous CS showed a significant divergence from parity ($\chi 2 = 81.023$, $p = <0.001$). 36.3% of multiparous women had history of previous 1 CS, and 25.7% had history of previous 2 CS. And only 0.9% had h/o previous 3 CS.

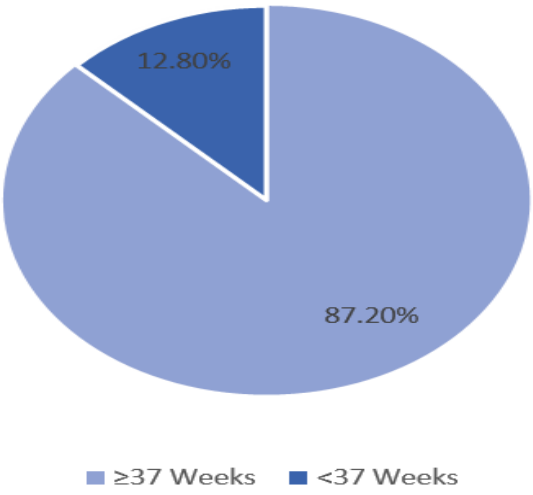

Figure 7: Distribution of the Participants in Terms of Gestational Age Category

The mean (SD) of Gestational Age (Weeks) was 38.55 (1.94). 87.2% of the participants had Gestational Age ≥37 Weeks. 12.8% of the participants had preterm gestation of <37 Weeks.

Table 4: Distribution of the Participants in Terms of Onset of Labour

Onset of Labour	Frequency	Percentage	95% CI
Spontaneous	174	89.2%	83.8% - 93.1%
Induced Labour	11	5.6%	3.0% - 10.1%
Pre-Labour CS	10	5.1%	2.6% - 9.5%

89.2% of the patients had spontaneous labor. 5.6% patients had Caesarean for a failed induced labour for various indications. While only 5.1% patients had pre- labour CS. In terms of Robson's Group distribution, there was a notable variation in the commencement of labor. ($\chi 2 = 155.289$, **p = <0.001**).

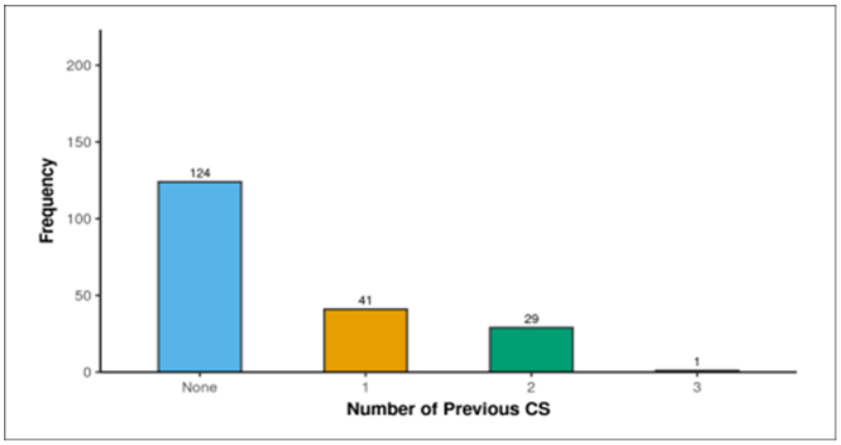

Figure 8: Distribution of the Participants in Terms of Number of Previous CS

Around 63.6% patients did not have a history of previous CS. 21.0% of the participants had history of Previous 1 CS. 14.9% of the participants had Previous 2 CS. 0.5% of the participants had history of Previous 3 CS.

Table 5: Association between Previous CS and Onset of Labour

Onset of Labour	Previous CS			Fisher's Exact Test	
	Yes	No	Total	$\chi 2$	P Value
Spontaneous	66 (94.3%)	108 (86.4%)	174 (89.2%)	6.546	0.021
Induced Labor	0 (0.0%)	11 (8.8%)	11 (5.6%)		
Pre-Labour CS	4 (5.7%)	6 (4.8%)	10 (5.1%)		
Total	70 (100.0%)	125 (100.0%)	195 (100.0%)		

No patients in RG-5 were exposed to induction of labour. There was a notable variation in the distribution of Onset of Labor among the different groups. ($\chi 2 = 6.546$, **p = 0.021**).

Table 6: Distribution of the Participants in Terms of No. of Foetuses

No. of Foetuses	Frequency	Percentage	95% CI
Single	190	97.4%	93.8% - 99.1%
Twin	5	2.6%	0.9% - 6.2%

Majority of the patients (97.4%) had singleton pregnancies. While 2.6% of patients had twin gestation.

Table 7: Distribution of the Participants in Terms of Foetal Lie and Presentation

Foetal Lie and Presentation	Frequency	Percentage	95% CI
Cephalic	173	88.7%	83.2% - 92.6%
Breech	15	7.7%	4.5% - 12.6%
Transverse	5	2.6%	0.9% - 6.2%
Compound	2	1.0%	0.2% - 4.0%

88.7% of the patients had cephalic presentation while 7.7% cases had breech presentation. 2.6% had transverse and 1% compound presentations.

Table 8: Distribution of the Participants in Terms of Indication for CS

Indication for CS	Frequency	Percentage	95% CI
Non Bleeding Placenta Previa	4	2.1%	0.7% - 5.5%
CDMR	12	6.2%	3.4% - 10.8%
Cephalopelvic Disproportion	7	3.6%	1.6% - 7.6%
Failed Induction	9	4.6%	2.3% - 8.9%
Foetal Distress	56	28.7%	22.6% - 35.7%
Malpresentation	7	3.6%	1.6% - 7.6%
Obstructed Labour	12	6.2%	3.4% - 10.8%
Precious Pregnancy	5	2.6%	0.9% - 6.2%
Previous 1 CS +Scar Tenderness	42	21.5%	16.1% - 28.1%
Previous 2 CS+ Scar Tenderness	29	14.9%	10.3% - 20.8%
Previous 3 CS+ Scar Tenderness	1	0.5%	0.0% - 3.3%
Primigravida With Breech	7	3.6%	1.6% - 7.6%
Severe Oligohydramnios +FGR	4	2.1%	0.7% - 5.5%

Around 28.7% CS were done for Foetal distress, while 36.4% cases were for a previous uterine scar (Previous 1 CS- 21.5%, Previous 2 CS- 14.9%, Previous 3 CS 0.5%). 6.2% for CDMR and 2.1% for Non bleeding placenta previa, 6.2% for obstructed labour, 4.6% for failed induction, 3.6% each for Cephalopelvic disproportion, malpresentation, and primi breech respectively while precious pregnancy and severe oligohydramnios and FGR, contributed 2.6% and 2.1% respectively.

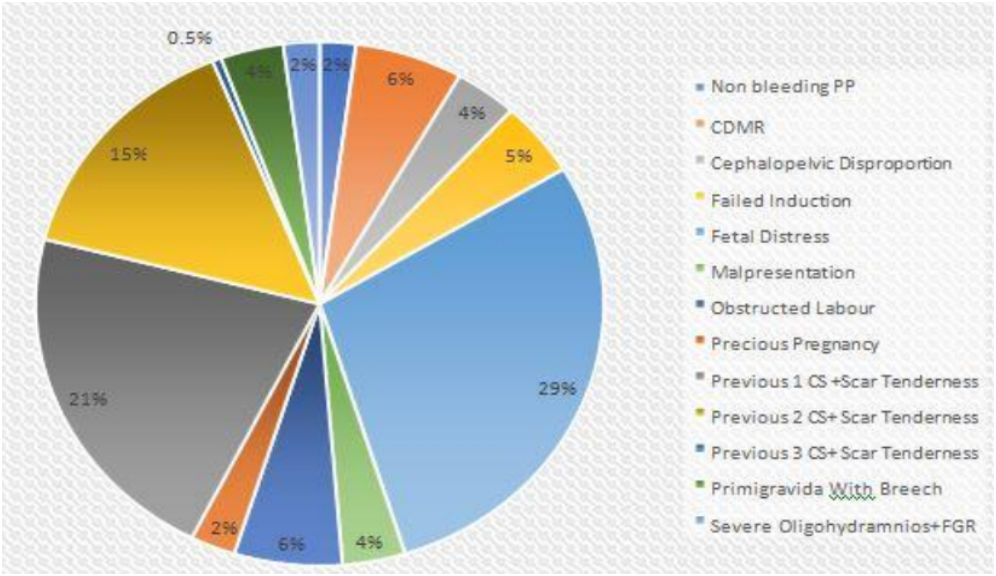

Figure 9: Distribution of Indications for CS

In RG-1, 12.5% cases were for CPD, 16.6% for obstructed labour, and 60.4% for fetal distress. Both in RG-2 and 4 the most common indication was failed induction.

Table 9:

	RG-1	RG-2	RG-3	RG-4	RG-5	RG-6	RG-7	RG-8	RG-9	RG-10
Non bleeding PP	1		1				1			1
CDMR			6				1			5
CPD	5									1
Failed induction		6		2						1
Fetal Distress	30	2	15	1				2	1	4
Malposition			1					1	5	1
Obstruction	8		4							
Precious pregnancy	1	1						1		2
Previous 1 CS	1				37		1			3
Previous 2 CS					24		1	1		3
Previous 3 CS					1					

Primi breech						7				
Severe Oilgo +FGR	2									2
TOTAL	49	9	27	3	62	7	4	5	6	23

In RG-5, most common indication was previous 1 CS (59.6%), 38.7% for previous 2 CS, (0.01%) for previous 3 CS, Primi-breech was the only indication for RG-6. RG-8 had 20% indication of precious pregnancy. And 50% cases in RG-10 had indication severe oligohydramnios and FGR. In terms of Robson's Group distribution, there was a significant difference between the indication for CS ($\chi 2 = 661.816$, $p = <0.001$).

Table 10: Distribution of the Participants in Terms of Robson's Group

Robson's Group	Frequency	Percentage	95% CI
Group 1	49	25.1%	19.3% - 31.9%
Group 2	9	4.6%	2.3% - 8.9%
Group 3	27	13.8%	9.5% - 19.7%
Group 4	3	1.5%	0.4% - 4.8%
Group 5	62	31.8%	25.4% - 38.9%
Group 6	7	3.6%	1.6% - 7.6%
Group 7	4	2.1%	0.7% - 5.5%
Group 8	5	2.6%	0.9% - 6.2%
Group 9	6	3.1%	1.3% - 6.9%
Group 10	23	11.8%	7.8% - 17.4%

In our study majority (31.8%) of the population belonged to RG-5, followed by 25.1% in RG-1, 13.8% in RG-3, 11.8% in RG-10, And smaller proportions of 4.6% in RG-2, 3.6% in RG-6, 3.1% in RG-9, 2.6% in RG-8, 2.1% in RG-7 and smallest group was of RG-4, 1.5%.

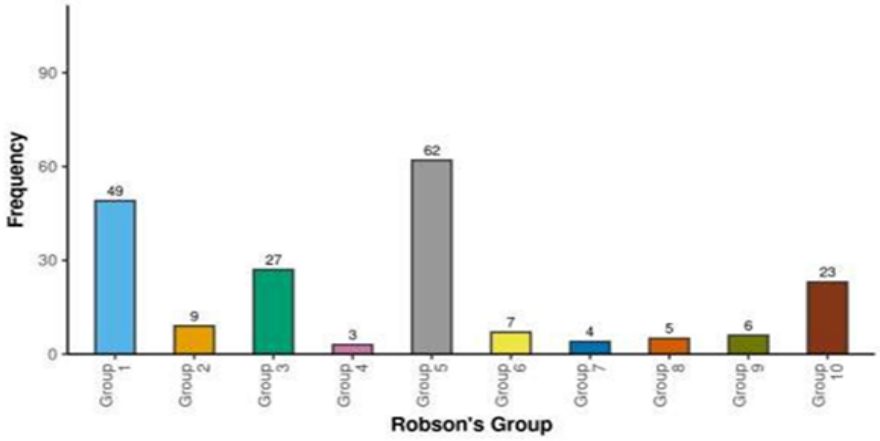

Figure 10: Distribution of Robson's Group

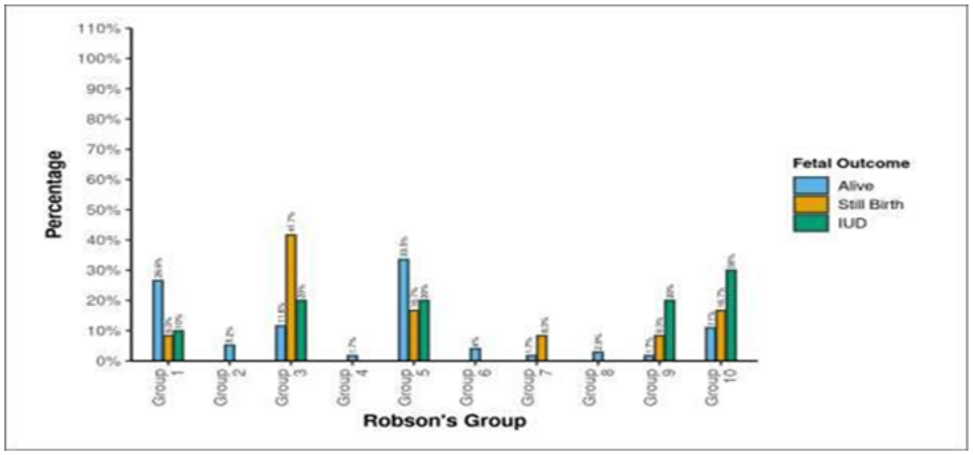

Figure 10: Fetal outcome in various Robson groups

Although foetal outcome was similar in RG-1 and RG5, having 26.6% and 33.3% livebirths, respectively. RG-3 had 41.7% cases of stillbirths. While RG-9 and RG-10 poor foetal outcome IUD in 20% and 30% cases, respectively. A notable disparity existed among the different groups for the distribution of Robson's Group ($\chi2$ = 31.557, p = 0.025).

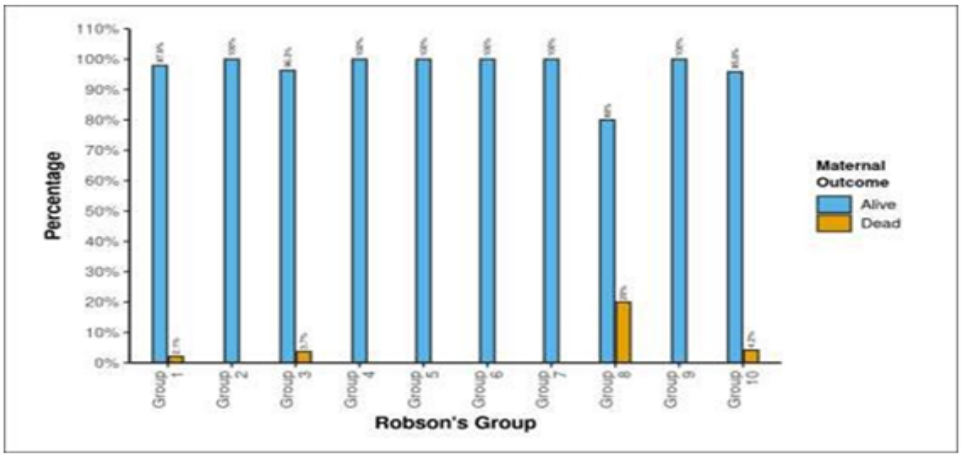

Figure 11: Maternal outcome in various Robson groups

No substantial variation was seen among the groups regarding the distribution of Maternal Outcome ($\chi2$ = 10.824, p = 0.232).

A notable disparity existed across the groups for the distribution of Post CS Complications ($\chi2$ = 99.326, p = 0.018). 20% cases in RG-8 had post-caesarean AKI. In RG-3, 3.7% cases had post CS-hypovolemic shock and 3.7% patients had postpartum eclampsia and 3.7% had postpartum psychosis, 6.2% cases in RG-1 had ICU admission. 4.2% cases in RG-10 had pulmonary oedema. 25.9% and 25% cases had PPH in RG-3 and RG7 respectively.

Surgical site infection was the most common complication for RG-8 with 50%, followed by 25% for RG-7.

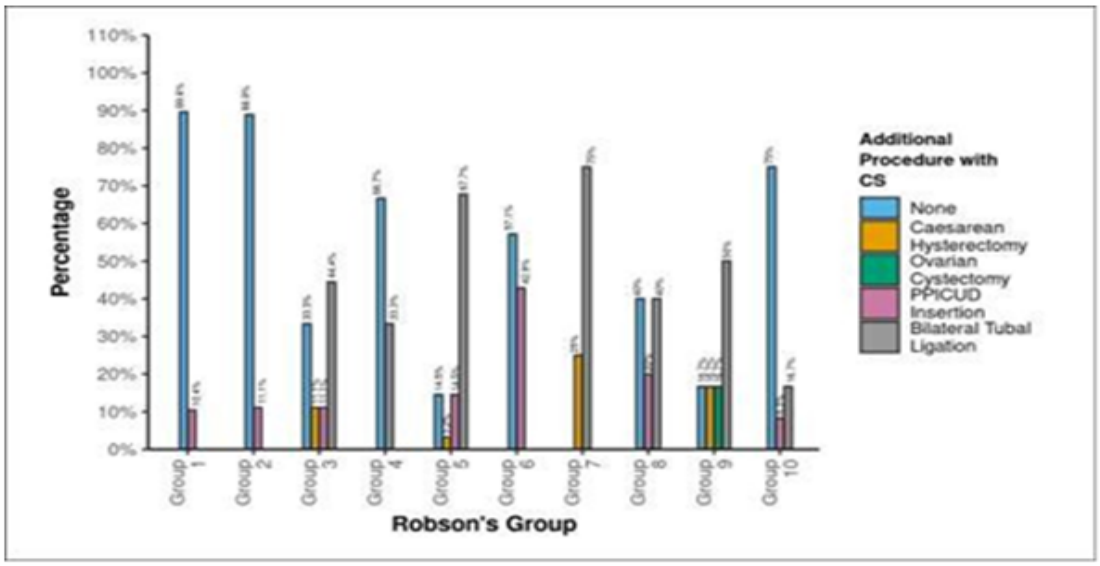

Figure 12: Association between Robson's Group and Additional Procedure with CS

67.7% of patients in RG-5, 44.4% patients in RG-3, 33.3% in RG-4, 75% in RG-7 (multiparous groups) opted for bilateral tubal ligation as a contraceptive procedure along with CS. While Post-Placental IUCD insertion during Caesarean was opted in 42.9% patients in RG-6, and in 14.5% of patients with a previously scarred uterus (RG- 5). A notable disparity existed across the groups for the distribution of Additional Procedure with CS ($\chi2$ = 144.730, p =< 0.001).

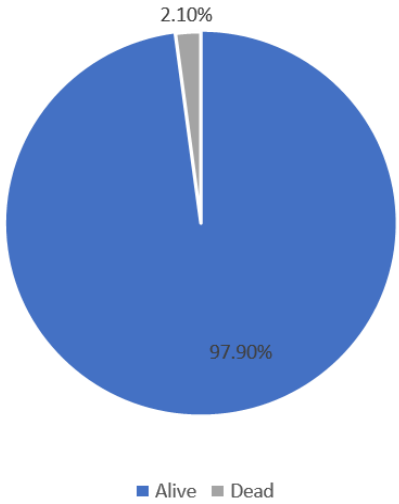

Figure 13: Distribution of the Participants in Terms of Maternal Outcome

97.9% of the participants had Maternal Outcome: Alive. While 2.1% of the participants had Maternal Outcome: Dead.

Table 13: Distribution of the Participants in Terms of Post CS Complication

Post CS Complication	Frequency	Percentage	95% CI
None	133	68.2%	61.1% - 74.6%
Acute Kidney Injury	1	0.5%	0.0% -3.3%
Hypovolemic Shock	1	0.5%	0.0% - 3.3%
ICU Admission	6	3.1%	1.3% - 6.9%
Postpartum Eclampsia	2	1.0%	0.2% - 4.0%
Pulmonary Oedema	2	1.0%	0.2% - 4.0%
Postpartum Haemorrhage	17	8.7%	5.3% - 13.8%
Surgical Site Infection	32	16.4%	11.7% - 22.5%
Postpartum Psychosis	1	0.5%	0.0% - 33%

68.2% of the participants did not have any Post CS Complication. 0.5% of the participants had Post CS-Acute Kidney Injury.

0.5% of the participants had Post CS- Hypovolemic Shock. 3.1% of the participants had ICU Admission. 1.0% of the participants had Post Postpartum Eclampsia. 1.0% of the participants had Post CS - Pulmonary Oedema. 8.7% of the participants had Postpartum Haemorrhage.

16.4% of the participants had Surgical Site Infection. 0.5% of the participants had Postpartum Psychosis.

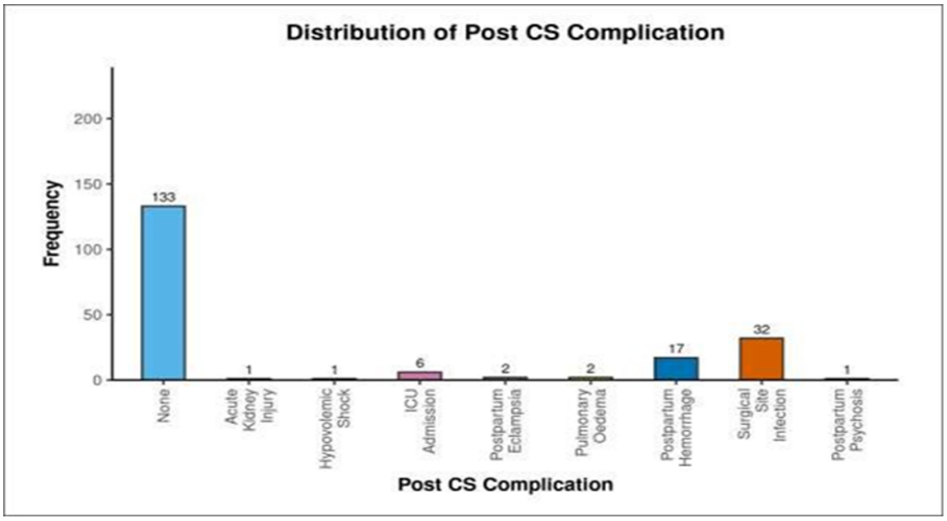

Figure 14: Distribution of Post CS Complication

Table 14: Distribution of the Participants in Terms of Additional Procedure with CS

Additional Procedure with CS	Frequency	Percentage	95% CI
None	96	49.2%	42.0% - 56.4%
Caesarean Hysterectomy	7	3.6%	1.6% - 7.6%
Ovarian Cystectomy	1	0.5%	0.0% - 3.3%
PPICUD Insertion	24	12.3%	8.2% - 18.0%
Bilateral Tubal Ligation	67	34.4%	27.8% - 41.5%

49.2% of the participants did not have any Additional Procedure with CS. 3.6% of the participants had Caesarean Hysterectomy. 0.5% of the participants had Ovarian Cystectomy. 12.3% of the participants had Intra Caesarean PPICUD Insertion. 34.4% of the participants had Bilateral Tubal Ligation.

Discussion

The caesarean section is a dynamic procedure that influences maternal and fetal outcomes in numerous ways. In the past few decades, numerous classifications have been suggested by various authors, out of which the woman-based Robson Ten Group Classification has become the most used.

The CS rate in the given study period has been calculated to be 50.96% which is much higher than the WHO recommended rate [4] of 10- 15%, it is also higher than what was observed in India (in 2019-2021) [8], a rate of 21.5%. Our study can be compared with the one by Gupta, Meeta, and Vineeta Garg at Jaipur (Rajasthan), in 2016, where CSR was 31.46% [9], Nazneen Ahmed et al, Dhaka, Bangladesh in 2019 concluded CSR to be 81.81% [10], Abhilasha Yadav et al, at Agra in 2020 concluded CSR to be 26.22% [11], Ashutosh Jogia, Krishna A Mehta in their study in Gujrat in 2020, concluded CSR to be 41.49% [12]

The demographic indices, obstetric parameters, indications of CS, intra and post-operative outcomes have been analysed in this study done in a sample size of 195 women.

Age

In our study majority of the patients were between 20-30 years, (75.9%), with a mean age of 26.15 years.

Robson Group 1 (that includes primigravidae) had maximum patients age <20 years (78.6%), while Robson Group 5 (multigravidae group) had 38.5% patients in 20-30 years age group, while none patients in this group were aged <20 years. A notable disparity existed among the different groups for the distribution of Robson's Group ($\chi 2 = 43.217$, $p < 0.001$).

Household

82.1% of the population belonged to the rural areas, while 17.9% patients were from the urban sector. This means that patients from the interior and far-away rural locations prefer to choose an institution with a low out-of-pocket expenditure.

ANC Booking

Only 10.3% cases were booked either in DMCH or elsewhere, while a mammoth of 89.7% cases were unbooked. This indirectly reflects the fear and hesitation of women to approach the health care facilities. In the NFHS-5 (2019-21), India fact sheet, it is mentioned that around 58.1% patients had at least 4 ANC visits. [8]

Referral

As our institution is a tertiary care center, an FRU for many PHCs, CHCs and District Hospitals, around 71.3% of the patients were referred from various places. This shows a strong referral system in our state.

Socio-economic status

Around 71.8% of patients in our study belonged to lower socio-economic class, which indicates that our institution serves well hesitant lower socioeconomic group of patients.

Indices and obstetric examination-

a. History of previous abortion-

Around 80% of the women in our study were without any history of abortion.

b. Parity

57.9% of the patients were multigravida women while only 42.1% of the women were primigravida. Our study can be compared with the one done by Sugianto, A. A. N.Jaya Kusuma et, al, at Sanglah General Hospital Denpasa in 2018, where 31.9% of the cases were primigravida [13] And in study done by Tahira Kazmi, Sarva Saiseema, V, and Sultana Khan in 2012 in Oman, 60% cases were primigravida [14]

While a significant association was seen in multiparous women with a history of previous C-section ($\chi 2 = 81.023$, $p = <0.001$), 36.3% of multiparous women had history of previous 1 CS, and 25.7% had history of previous 2 CS. And only 0.9% had h/o previous 3 CS. This directly reflects the increased representation of women with a scarred uterus (RG5) within the multigravida.

c. Gestational age

Majority of the patients 87.2%.had a gestational age of >37 completed weeks, and only a meagre of 12.8% patients who underwent CS had a preterm pregnancy of <37 weeks. i.e, were in RG-10.

d. Onset of labour

89.2% of the patients had spontaneous labor. 5.6% patients had Casearean for a failed induced labour for various indications. While only 5.1% patients had pre-labour CS. While there was no induction of labour in women with a previous uterine scar (RG-5), this directly reflects the non-selection of TOLAC, and 54.5% of the patients in RG-2 had induced labour, and 40% of patients in RG-10 had a pre-labour CS.

e. History of a previous Caesarean section-

Around 63.6% patients did not have a history of previous CS. In our study patients with scarred uterus turned out to be 31.8% of the population, this included 21.1% -previous 1 CS, 14.9% - previous 2 CS and only 0.5% cases - previous 3 CS. Our study can be compared with one done by Sugianto, A. A. N. Jaya Kusuma et al. reported that around 73.2% of the samples lacked a history of prior cesarean sections. [13]

f. No. of fetuses

Majority of the patients (97.4%) had singleton pregnancies. While 2.6% of patients belonged to RG-8. These 2.6% patients had twin gestation.

g. Fetal lie and presentation

88.7% of the patients had cephalic presentation while 7.7% cases had breech presentation (RG-6 and RG-7). 2.6% had transverse and 1% compound presentations i.e, 3.6% belonged to (RG- 9). The study can be compared with the one done by Wahanen A et al, where RG-6 (10.13%) and RG-9 (0.63%) had least representation. [15]

Indication for CS-

Around 28.7% CS were done for Fetal distress, while 36.4% cases were for a previous uterine scar (Previous 1 CS- 21.5%, Previous 2 CS- 14.9%, Previous 3 CS 0.5%). 2.1% Cs could be attributable to non-bleeding placenta previa, 6.2% for obstructed labour, 6.2% for CDMR,4.6% for failed induction, 3.6% each for Cephalopelvic disproportion, malpresentation, and primi breech, respectively, while precious pregnancy and severe oligohydramnios, and FGR, contributed 2.6% and 2.1% respectively.

Our study can be compared with the one done by Nazneen Ahmed et al where the most common indication was previous 1 CS (29.18%), followed by fetal distress (21.5%). [10]

In their study, Pravina P, Ranjana R, and Goel N stated that the primary indicators for CS were malpresentation, failed induction, fetal distress, previous CS, and labor arrest. [16]

In their study, Jasia Jabeen et al. found that prior caesarean sections were a substantial indication for cesarean sections (40.37%). Fetal distress and unsuccessful induction rates were 11.23% and 13.58%, respectively. In 6.73% of cases, fetal malpresentation, including breech, was observed. [17]

According to a study by Gupta, Meeta, and Vineeta Garg, the leading indication for the CS rate was prior LSCS (36.52%), which was followed by labor arrest (13.65%), CPD (12.03%), fetal distress (11.82%), breech presentation (7.52%), oligohydroamnios/IUGR (5.16%), and unsuccessful induction of labor (3.54%). [9]

In RG-1, 12.5% cases were for CPD, 16.6% for obstructed labour, and 60.4% for fetal distress. Both in RG-2 and 4, the most common indication was failed induction. In RG-5, the most common indication was previous 1 CS (59.6%), 38.7% for previous 2 CS, (0.01%) for previous 3 CS Primi-breech was the only indication for RG-6. Around 25% cases for abruptio placentae were done in RG-7. RG-8 had a 20% indication of precious pregnancy. And 50% cases in RG-10 had indication severe oligohydramnios and FGR.

Fetal outcome

88.7% cases were live births while 6.2% cases were still births and Intrauterine fetal demise comprised 5.1% of the cases.

Robson's Group distribution

In our study majority (31.8%) of the population belonged to RG-5, followed by 25.1% in RG-1, 13.8% in RG-3, 11.8% in RG-10, And smaller proportions of 4.6% in RG-2, 3.6% in RG-6, 3.1% in RG-9, 2.6% in RG-8, 2.1 in RG-7 and smallest group was of RG-4, 1.5%. Tura AK, Pijpers O,de Man M, et al were major contributors of CS, were 21.4%- RG-3, 21.1%- RG-5, 19.3%- RG-1. [18]

According to Wahane A. et al.'s research, Group 5 contributed the most (20.5%) to the total CS rates, followed by Group 1 (16.08%). [15] According to Jamwal D. et al.'s study, the majority of cesarean sections fell within Robson criterion groups 2 and 5, with respective percentages of 29.2% and 40.3%. [19] Kanmani Murugesan, Sasirekha Rengaraj in their study mentioned that maximum contribution of CS was by group 5 followed by group 2 with 34.9% and 18.9%, respectively. [20] Renu Jain, Vrunda Joshi conducted a study wherein 34.51% - RG-1, and 38.55% - RG-5. [21]

Robson group and fetomaternal outcome-

Although fetal outcome was similar in RG-1 and RG5 having 26.6% and 33.3% livebirths respectively. RG-3 had 41.7% cases of stillbirths. In RG-3 most common indication was bleeding placenta previa, which might have lead to fetal loss. While RG-9 and RG-10 poor fetal outcome IUD in 20% and 30% cases respectively. RG-9 had patients with malpresentation which in our setup are the gravida who have had an untrained trial of birth at home, they reach us usually in fetal imperilment and eventually loss. RG-10 has women with preterm gestation, these babies are usually lost to prematurity.

20% cases in RG-8 had post caesarean AKI. In RG-3, 3.7% cases had post CS- hypovolemic shock and 3.7% patients had postpartum eclampsia and 3.7% had postpartum psychosis, 6.2% cases in RG-1 had ICU admission. 4.2% cases in RG-10 had pulmonary oedema. 25.9% and 25% cases had PPH in RG- 3 and RG7 respectively. Surgical site infection was the most common complication for RG-8 with 50%, followed by 25% for RG-7. 67.7% of patients in RG-5, 44.4% patients in RG-3, 33.3% in RG-4, 75% in RG-7 (multiparous groups) opted for bilateral tubal ligation as contraceptive procedure along with CS reflecting a strong family planning counselling system in our centre. While Post-Placental IUCD insertion during Caesarean was opted in 42.9% patients in RG-6, and in 14.5% of patients with previously scarred uterus (RG-5).

Maternal outcome

In our study only 2.1% cases had adverse outcome of maternal mortality, rest 97.9% patients were alive post CS.

Post-CS complication

Around 68.2% patients had uneventful post-operative history, while 16.4% patients had surgical site infection which could be attributable to a poor nutritional status of women in India, anemia in pregnancy, previous history of LSCS.

Anaemia, prior LSCS as a CS indication, intraoperative blood transfusion, inappropriate pre-operative antibiotic prophylaxis, and comorbid conditions such as heart disease, kidney disease, chronic liver and hypothyroidism were all found to be significantly associated with SSI, according to the study by Gupta S. et al. [22] 8.7% patients had PPH. 3.1% had ICU admission. A few of them had severe morbidity in the form of AKI, Hypovolemic shock, Pulmonary oedema (0.5%, 0.5% and 1% respectively) 0.5% cases had poast partum psychosis.

Additional procedure with CS

12.3% of patients consented to PPIUCD insertion, whereas 34.4% of patients underwent bilateral tubal ligation surgery and Cs in the same setting. This is because more women are choosing long-term spacing methods rather than sterilizations since PPIUCD was introduced in the national family program. Interval IUCD is inferior to PPIUCD. [23] 3.6% cases had to undergo Caesarean hysterectomy for various indications. While 0.5% patients had ovarian cystectomy along with CS.

Conclusion

The Robson Ten Group Classification System (RTGCS) is a WHO-recommended, standardized, and practical tool for analyzing and auditing cesarean section (CS) trends. Its application at DMCH reveals a concerning rise in CS rates, especially among primigravida women experiencing fetal distress and multigravida women with previous cesarean scars, indicating a limited acceptance of trial of labor after cesarean (TOLAC). Increased labor inductions and malpresentations also contribute significantly to the overall CS burden. Addressing these factors through standardized indications, resident training, promoting VBAC, and strengthening family planning counselling during CS can help rationalize its use. Routine audits using RTGCS are essential to curb unnecessary cesarean deliveries and promote safer, evidence-based obstetric care.

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