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Original Research Article

# Study to Analyse Caesarean Sections Rate According to Robson's Ten Group Classification in a Tertiary Care Centre

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**Abstract**

**Aim:** The present study was conducted to find out the frequency and indications for CS and to analyze them according to Robsons ten group classification.

**Material & Methods:** All women who underwent caesarean section at Department of Obstetrics and Gynaecology were included in our study. Exclusion criteria include all mothers who underwent vaginal delivery in our institute and those women with missing records. The study population included 2035 women who underwent caesarean in our hospital over the duration of 1 year (from May 2022 – May 2023).

**Results:** During the study interval total of 2035 women delivered via C-section. Majority of the women were between 20-30 years (90%). Out of them 68.45% were multigravida's and 31.54% were nulliparous. 67.07% women were between the gestational age of 37-40 weeks. 46.92% of women went into spontaneous labour and 21.13% of them underwent pre labour caesarean section. Out of which 81.08% of babies had a 5 minutes APGAR above 7 and only 18.91% babies had a score less than or equal to 7.80.34% of the babies were average weight between 2.5-3.9 kg. Distribution of all deliveries performed during the study period in accordance to Robsons criteria showed majority of women (36.21%) belonged to group5 and group2(27.61%). This was followed 16.01% women in group 1. The most common indication for caesarean seen in our study was previous LSCS seen in 38.32%(780)women followed by fetal distress seen in 265(13%) women.

**Conclusion:** According to Robsons criteria group 5 and group 2 were the groups found to be majorly contributing the most to the caesarean section in our study. There is a need to evaluate existing management protocols and further studies need to be conducted into the indications of CS and outcomes in our setting are needed to design tailored strategies and improve outcomes.

**Keywords:** Caesarean section/delivery, Robsons



## Introduction

The Caesarean Section (CS) delivery rate in the India has steadily increased over last 20 years. In cases where spontaneous vaginal delivery (SVD) is not possible or contraindicated, avoiding CS may endanger the lives of mother and the fetus. [1,2] However it is also a reality that CSs are also done without clear indications or with vague indications like obstructed labour, with intact membranes. [3] CSs are considered to be a life-saving procedures but these are not without risks attached in terms of present or future pregnancies. World Health Organization has recommended that Caesarean Section (CS) rates should not be more than 15%, as CS rates above this are not associated with additional reduction in maternal and neonatal mortality and morbidity. [4,5]

A significant proportion of healthy women undergo CS unnecessarily despite the increased risk of serious maternal outcomes with the procedure, and counter to the recommendation to perform it only when the benefits anticipated are clear and offset the increased cost and additional risk associated with the operation. [6] Some of the most common short and long term complications associated with CSs are increased chances of maternal morbidity

and mortality, increased requirements of blood transfusion, prolonged hospital stays, post-partum infections, retained placenta, stillbirth and post-partum hemorrhage. [7] This indicates that if not chosen rightly, some women may have needless exposure to these complications while contrary to this, some women might not be getting CS when they are in real need. For this an appropriate classification to identify the groups of women undergoing CS and investigation of the underlying reasons for trends is essential so that appropriate effective measures to reduce CS rates can be implemented.

To safely reduce the increasing prevalence of CDs, the World Health Organization (WHO) recommended the Robson classification as a tool for monitoring and auditing CD rates in 2016. [8] The classification uses 6 basic obstetrical variables (parity, previous CD, onset of labour, gestational age, number of fetuses, fetal life, and presentation) to classify each woman into 1 of 10 groups.

Hence the present study was conducted to find out the frequency and indications for CS and to analyze them according to Robson' ten group classification.

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This would be helping in adopting suitable measures to reduce the CS rate and identifying various challenges in our setting.

**Material & Methods**

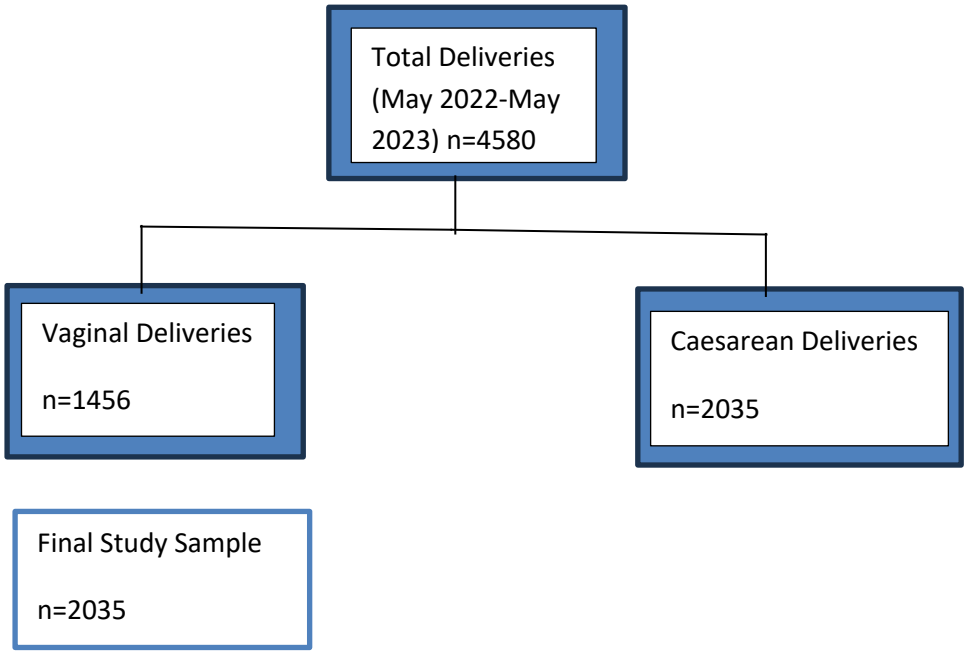
This was a cross-sectional study done in the Department of Obstetrics and Gynecology at ANMCH, Gaya, Bihar India over the duration of 1 year. Written consent was taken from all the study participants.

**Inclusion Criteria**

- All women who underwent caesarean section in our institute were included in our study.

**Exclusion Criteria**

- All mothers who underwent vaginal delivery in our institute and those women with missing records.
- Flow Chart of deliveries in our study population:
- Chart of deliveries in our study population:




**Methodology**

The study population included 2035 women who underwent caesarean in our hospital during the above-mentioned study period. For all the women enrolled, maternal history, bio-data, symptomatology, clinical examination, management outcomes, pregnancy-related information (gestational age, fetal presentation, number of fetus and onset of labour) and maternal and fetal outcomes at discharge (complications, APGAR score at five minutes, birth weight) were recorded. The dependent variable was Robson classification group. All the study information was noted on a predesigned proforma.

Demographic data and relevant history like clinical examination, management outcomes, pregnancy related information and maternal and fetal outcomes were recorded from the women. These women were then categorized into 10 groups

according to the Robson classification report table by the WHO.

**Table-I: Robsons Ten Group Classification System.**

| Group | Description |
|---|---|
| 1 | Nullipara, single, cephalic, term pregnancy, spontaneous labour |
| 2 | Nullipara, single, cephalic, term, induced labour or planned CS |
| 3 | Multipara without uterine scar, single, cephalic, term, spontaneous labour |
| 4 | Multipara without uterine scar, single, cephalic, term, induced labour or planned CS |
| 5 | Multipara with uterine scar, single, cephalic, term |
| 6 | Nullipara, single, Breech presentation |
| 7 | Multipara, single, breech, including previous C-Section |
| 8 | Multiple Pregnancy |
| 9 | Single, abnormal lie, including previous scar |
| 10 | Single, Cephalic, Preterm including previous scar |

**Statistical Analysis**

All completed data was entered in SPSS version 26.0 for analysis. Descriptive statistics of study participants and variables were calculated. The Robson group was assigned based on four obstetric concepts (with their parameters)-category of the pregnancy, previous obstetric history, course of labour and gestational age. Absolute maternal indications included obstructed labour, major antepartum haemorrhage (APH), malpresentation (transverse, oblique and brow) and uterine rupture in hierarchical order. Non absolute indications included fetal compromise, previous CS, failure to progress, breech, severe pre-eclampsia and eclampsia (with no hierarchy). Results were represented as frequencies, percentages, means and SD.

**Results**

**Table 1: Characteristics of study participants**

| Category | | Number | % |
|---|---|---|---|
| **Age (years)** | <20 | 100 | 4.91% |
| | 20-30 | 1850 | 90.90 |
| | > 30 | 85 | 4.17 |
| **Parity** | Nulliparous | 642 | 31.54 |
| | P1-2 | 1161 | 57.05 |
| | Multiparous | 232 | 11.40 |
| **Gestational age** | <37 weeks | 350 | 17.19 |
| | 37-40 weeks | 1365 | 67.07 |
| | >40 weeks | 320 | 15.72 |
| **History of previous c- section** | None | 1235 | 60.68 |
| | Yes | 800 | 39.31 |
| **Onset of labour** | Spontaneous | 955 | 46.92 |
| | Induction of labour | 650 | 31.94 |
| | Pre labour CS | 430 | 21.13 |
| **Fetal presentation** | Cephalic | 1750 | 85.99 |
| | Breech | 160 | 7.86 |
| | Traverse Lie | 125 | 6.14 |
| **APGAR score at 5 minutes** | ≤7 | 385 | 18.91 |
| | >7 | 1650 | 81.08 |
| **Birthweight (gm)** | <1500 | 70 | 3.43 |
| | 1500-2499 | 250 | 12.28 |
| | 2500-3999 | 1635 | 80.34 |
| | >4000 | 80 | 3.93 |
| Fetal status at birth | Alive | 1650 | 81.08 |
| | Still birth | 192 | 9.43 |
| | IUD | 193 | 9.48 |
| Number of foetuses | singleton | 1960 | 96.3 |
| | multiple | 75 | 3.68 |
| NICU Admission | | 192 | 9.43 |

| | | | |
|---|---|---|---|
| Neonatal mortality | | 21 | 1.03 |
| Maternal morbidity and mortality | | | |
| | PPH | 153 | 7.51 |
| | Moderate and severe anaemia | 432 | 21.22 |
| | Wound infection | 56 | 2.75 |
| | Postpartum AKI | 12 | 0.58 |
| | Blood transfusion | 121 | 5.94 |
| | Ruptured uterus | 25 | 1.22 |
| | ICU Admission | 31 | 1.81 |
| | Maternal mortality | 40 | 1.96 |

Out of 3490 deliveries during the study period ,the no. of caeserian section was 2035 with CS rate of 58.30 %in our institute. The majority of the study population were in the age group of 20-30 years(90.90%),parity between 1-2 was seen in 57.05 %of women while 31.54 % of women were nulliparous while multiparous women constitute only 11.40% of study population. Among the study population, a history of previous CS was present in 39.31% of women,while60.68% of women had unscarred uterus. Most of the CS. at the term gestational age67.07%.46.92% of patients were admitted to labour room with labour pain. Induction of labor was done in 31.94%of cases while 21.13% of patient were taken directly for CS without prior labour pain. Cephalic presentation was the most common presentation seen in 85.99 %of cases and 96.31%of foetuses were singleton.81.08% of foetus had APGAR score >7,80.34%of the foetus birth weight was 2.5 kg to 3.9 kg with neonatal mortality was noted in 1.03%of cases. In our study ,maternal complications were seen in 42.99% of the study population.

**Table 2: Distribution of caesarean section in terms of Robsons classification**

| Robson's Group | Total number of CS. In each group | n1 | n2 |
|---|---|---|---|
| Group 1 | 326 | 16.01% | 3.61% |
| Group 2 | 562 | 27.61% | 16.10% |
| Group 3 | 46 | 2.26% | 1.31% |
| Group 4 | 55 | 2.70% | 1.57% |
| Group 5 | 737 | 36.21% | 21.11% |
| Group 6 | 71 | 3.48% | 2.03% |
| Group 7 | 43 | 2.11% | 1.23% |
| Group 8 | 22 | 1.08% | 0.63% |
| Group 9 | 22 | 1.08% | 0.63% |
| Group 10 | 151 | 7.42% | 4.32% |

N1= Contribution of each group of total CS. (%)

N2= Contribution of each group to total birth (%)

In our study group 5 were the highest contributors to the overall CS. Rate contributing 36.21% of all CS. and 21.11% to all deliveries. Group 2 (Nulliparous, Cephalic>37 weeks induced labour or CS. before labour) were the 2nd highest contributors, contributing 27.61% to overall CS. and 16.10% of all deliveries. The 3rd highest contributors were single, cephalic, nulliparous women at term and in spontaneous labour (Group 1) contributing 16.01% to overall CS. rate and 3.61% of all deliveries. The 4th Highest contributor were single, cephalic, 36 weeks including previous CS. (Group 10) contributing 7.42% to overall CS. and 4.32% of all deliveries.

**Table 3: Indications leading to caesarean section in the present study**

| Indication | Number (n=100) | % |
|---|---|---|
| Non-progression of labour | 150 | 7.36 |
| Previous CS | 780 | 38.32 |
| Failed Induction | 81 | 4 |
| Hypertensive disorders ofpregnancy | 238 | 11.68 |
| CPD | 81 | 4 |
| Breech presentation | 81 | 4 |
| Traverse lie | 41 | 2 |
| Fetal distress | 265 | 13 |
| PROM | 122 | 6 |

| | | |
|---|---|---|
| Multiple pregnancies | 41 | 2 |
| Oligohhydramnios with IUGR | 61 | 3 |
| Abrupto placenta | 27 | 1.32 |
| Placenta previa | 34 | 1.68 |
| MSL | 27 | 1.32 |
| RHD with MS | 6 | 0.3 |

The most common indication for caesarean seen in our study was previous LSCS seen in 38.32%women followed by fetal distress seen in13%women.

**Discussion**

The Caesarean Section (CS) delivery rate in the India has steadily increased over last 20 years. According to an Indian Council of Medical Research (ICMR) task force study, the CS rate has increased to 28.1% in 2005-06, that was 21.8% in 1993-94.[9,10] World Health Organization has recommended that Caesarean Section (CS) rates should not be more than 15%, as CS rates above this are not associated with additional reduction in maternal and neonatal mortality and morbidity. [11,12] The reason for the increase in caesarean births are variable including use of electronic fetal monitoring during labor, increasing number of pregnancies following infertility treatment including the multifetal pregnancy, increasing incidence of elderly gravida, increasing number of women with prior caesarean delivery, changes in obstetric training regarding the use of instruments and medico legal concerns etc. The rates vary from one hospital to other and one country to other. A systematic review of classifications for caesarean section in 2011 suggested that a women-based classifications in general and Robson's classification in particular is best for auditing, analyzing and comparing CS rates across different settings and this helps to create and implement effective strategies specifically targeted to optimize CS rates wherever necessary. [13]

During the study interval total of 2035 women delivered via c-section. Majority of the women were between 20-30 years (90.90%). This is comparable to the study done by Abubeker et al most of the study group belonged to the age group of 20-34 years. [14] Out of them 68.4% were multigravida and 31.54% were nulliparous. This is similar to the study done by Bello et al where 62.6% women were multiparous. [15] 67.07% women were between the gestational age of 37-40weeks similar to Abubeker et al and Bello et al, where the majority of women belonged to the group more than 37 weeks gestational age. [14,15] 46.92% of women went into spontaneous labour and 21.13% of them underwent pre labour caesarean section. Out of which 81.08% of babies had a 5 minutes APGAR above 7 and only 18.91%(385) babies had a score less than or equal to 7.80.34% of the babies were average weight between 2.5-3.9kg. Distribution of all deliveries performed during the study period in accordance to Robsons criteria showed majority of women (36.21%) belonged to group 5. This was followed by group 2 (27.61%) to overall CS and 16.10% of all deliveries. Our study is slightly comparable to the study done by Pravina et al who found the predominant group to be group 5 (34.97%) followed by group 2 (26.35%) and Pourshirazi et al found group 5 as the predominant group contributing to the section rate in their study followed by group 2 and 1 respectively. [16,17]

The most common indication for caesarean seen in our study was previous LSCS seen in 38.32% women followed by fetal distress seen in 265 (13%) women. This was comparable the study done by Parveen et al in 2021 where they say similar results with previous cesarean being the most common seen in 34 women (20.4%), followed by fetal distress and hypertensives disorders of pregnancy seen in 238 women (11.68%) . [18]

**Conclusion**

According to Robson's criteria group 5 were the majority groups found to be contributing the most of the CS in our study. Group 2 were the 2nd highest contributor contributing 27.61% to overall CS and 16.10 % of all deliveries. The 3rd highest contributors were single, cephalic, nulliparous women at term and in spontaneous labour (group 1) 16.01%. The 4th highest contributors were group 10 (7.42%) of overall CS.

The above results are representative of the fact that our hospital being a leading tertiary care hospital of the region, most cases might be referred to our facility as high-risk cases. Some measures can be taken in identifying the high-risk factors sooner in pregnancy and the appropriate treatment to prevent undue complications that will ultimately lead to cesarean. This study also showed a high rate of CS among low-risk groups. These target groups require more in- depth analysis to identify possible modifiable factors and to make available and apply specific interventions to reduce the CS rate. There is a need to evaluate existing management protocols and further studies need to be conducted into the indications of CS and outcomes in our setting are needed to design tailored strategies and improve outcomes.

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