

Analysis of Cesarean Section Rates Using Robson Ten Group Classification System in A Tertiary Care Hospital of Peshawar: A Cross-Sectional Study

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ABSTRACT

Objective: To observe CS rates and assess them using Robson's Ten Groups Categorization System in a government tertiary medical facility in Peshawar, Pakistan

Study Design and Setting: From 1st March to 31st August 2023, a cross-sectional study was carried out at the Khyber Teaching Hospital's department of obstetrics and gynecology in Peshawar, Pakistan

Methodology: The research cohort consisted of 1250 women with CS who were hospitalized throughout the specified study period. Information on maternal features and pregnancy-related details was collected for every patient.

Results: 4227 women sought labor and delivery services during the course of the research. It was discovered that the CS rate was 29.5%. Most common were Groups 1 (7.57%), 3 (8.65%), and 5 (54.66%), which together accounted for around 69% of all CS occurrences. Group 5's CS rate was 80.7%, but subgroup 5.1's (previous CS) women experienced repeat CS at a rate of 65.14%. 95% babies were alive and 5% were stillborns.

Conclusion: Noticeable raise in the caesarean deliveries rate, leading to substantial worse influence in terms of health, finances, and society. Previous CS is the most prevalent sign of CS. CS if performed on primigravidae with a valid indication, the rate of CS may be managed.

Keywords: Primigravida, Caesarean Section, Abruptio Placentae, Multipara, Placenta Accreta

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INTRODUCTION:

In 1985, the World Health Organization decided that a rate of 10–15% cesarean sections is appropriate.¹ Thirty years after the WHO released its guidelines, there is still debate over the optimal CS rate. Other difficulties in more recent attempts to determine the optimal CS rate were confounders and the lack of external validity.² Despite its shortcomings, the proportion of caesarean sections performed as a percentage of the population is an important indicator of how easily accessible obstetric services are in a given country. The risks involved with this potentially life-saving procedure might potentially jeopardize the lives of the mother and the child in this or future pregnancies. Both the short- and long-term effects of CS have been studied; they include lengthier hospital admissions, a higher risk of postpartum hemorrhage, retained placentas, postpartum infections, and stillbirths.³

A universally acknowledged taxonomy is necessary for policymakers, program managers, physicians, and administrators to meticulously monitor the frequency of caesarean sections. A comprehensive assessment of the

current CS categorization was conducted before, revealing that RTGCS emerged as the most viable alternative among 27 potential classification systems.⁵ The Robson categorization system categorizes all CS into 10 groups based on predetermined fetomaternal characteristics.⁶ The characteristics encompass parity, prior caesarean section, fetal presentation, number of foetuses, and gestational age. Researchers have hypothesized that societal and economic factors may contribute to the increasing occurrence of non-medically advised cesarean sections, as seen by the large number of such instances. In order to assess and compare cesarean section (CS) rates within and between healthcare institutions, as well as to consistently analyze, monitor, and improve these rates, the World Health Organization (WHO) in 2014 and the International Federation of Gynecology and Obstetrics (FIGO) in 2018 suggested that the Robson Ten Group Classification System (RTGCS) should be adopted as a worldwide standard.⁷ The categorization technique relies on the routinely reported obstetric features of each woman, rather than being dependent on the reason for cesarean section (CS). This approach is straightforward to adopt and enables the examination and analysis of CS rates.⁸

Utilizing the Robsons ten group classification method effectively offers several advantages. It has allowed us to identify a specific subgroup within Robson's categorization that has a significant impact on the overall rate of cesarean sections. The importance of this stage of the audit process

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arises from the potential for actions that typically impact the CS rate.⁹ The methodology offers a reliable method for comparing inside an institution over time, as well as across institutions at a national, regional, or global level. Furthermore, it can be readily reproduced. RTGCS provides a reference point and historical data on the rates of CS, which may be used to assess the impact of surgery at various levels.¹⁰ The evaluation of Pakistani caesarean section trends has previously been done on a regional level using the RTGCS technique. Our department's deployment of RTGCS is driven by the same purpose, which is to identify the common groups that influence the caesarean section rate and provide meaningful interventions and approval for its improvement. This method is also utilized to construct a database of caesarean section rates in Pakistan.

METHODOLOGY:

At Gynaecology unit of Khyber Teaching Hospital, Peshawar, a cross-sectional research was done. A tertiary care center, Khyber Teaching Hospital handles about 10,000 births annually. In addition, it is a public hospital that primarily acts as a hub for high-risk patient referrals. All mothers who gave birth after 28 completed weeks of gestation between 1st March to 31st August 2023 were included in the research population. We did not include laparotomies performed for uterine rupture or prenatal births. The institutional research committee approved the study (Ref No.270/EC/KTH), and as it was a non-interventional study with no requirement for identify disclosure, informed permission from the mothers was not required.

Data was collected and stored by knowledgeable data collectors using a standardized proforma. This includes factors such as the foetal presentation or position, gestational age (term or preterm), number of foetuses, delivery mode , Parity and prior obstetric history. An obstetric ultrasound performed before to 24 weeks of pregnancy or the menstruation date was used to determine gestational age. When there was no milestone for period of gestation, we used birth weight in place of gestational age. We searched medical records for relevant pregnancy-related information. Nulliparous is defined as the woman who has not given birth to any baby at the time of study whereas multiparous is defined as the woman who has given birth to >2babies.

Version 20 of IBM SPSS Statistics for Windows was used to analyse the information. In the beginning, the organization's total CS rate was determined. Following the entry of all data, women were categorized into one of the 10 Robson categories. It was recorded how big each group was in relation to the overall obstetric population, how much of the CS rate each group contributed, and how much of the CS rate each group contributed overall.

RESULTS:

In all, 4227 women visited for labour and delivery throughout the six months. Two patients were omitted because of uterine

rupture, while twenty-five people were not included because of pre-viable babies. Consequently,4,200 births were considered. The average age was 25.3 ± 4.6 years. Table 2 shows that 29.5% of the population had CS. The sampling technique was non consecutive probability sampling and sample size was calculated by Open Epi.

Table 1: Robson’s 10 Group Classification

Group	Description
1	Primi,single cephalic,>37 weeks in spontaneous labor
2	2a-Primi,single,cephalic,>37 weeks,induced labor 2b-Primi,single,cephalic,>37 weeks,CS before labor
3	Multi(- prior CS),single,cephalic,>37weeks in spontaneous labor
4	4a- Multi,no prior scar,with singleton,cephalic, >37 weeks,induced labor 4b-Multi,no uterine scar,single, cephalic, > 37 weeks, CS prelabor
5	Prior CS,single,cephalic,>37 weeks
6	Primi,single breech fetus.
7	Multi,single breech fetus (+previous scar).
8	Multiple pregnancies (+ previous scar).
9	Single pregnancy in transverse or oblique lie (+prior scar).
10	Single, cephalic, < 37 weeks(including previous scar).

Table 2: Demographic Characteristics (N=4200)

Characteristics	Frequency	Percentage
Age		
Less Than 20	267	6.5
20-30 Years	3515	83
More Than 30Years	418	10
Parity		
Nulliparous	1761	42
Multiparous	2247	53
Grand Multiparous	192	4.7
Period Of Gestation		
Less Than 37 Weeks	909	22
37Weeks	3291	78
Labor Onset		
Spontaneous	2558	61
Iol	352	8.5
Caesarean Before Labor	1290	31
Presentation		
Vertex	3972	94
Breech	214	5.2
Transverse Or Oblique	14	0.5
Fetal Number		
Single	4190	99.6
Multiple	10	0.35

Group 1 women, accounted for 10.5% of all births and were nulliparous with a single cephalic pregnancy at term in spontaneous labour. Groups 3, which included 8.2% of the total, were followed by Group 10 (which included all women with singleton pregnancy before 37 completed weeks, including women with previous scar) in 11.3% cases, and multigravidae with singleton pregnancy at 37 weeks with cephalic presentation in spontaneous labour without prior scar. Group 5 represented 1.9% of the obstetric population and consisted of all multigravidae having one prior uterine scar and a single cephalic pregnancy at term. This puts it in last place in terms of size. The highest percentage of CS cases were contributed by Group 10 (18.7%), Group 2 (17.5%) (primigravidae with a single cephalic pregnancy at term who either experienced CS before the commencement of labour or an induction of labour), Group 5 (16.3%), and Group 4 (16%). These four categories enabled around 69% of all caesarean deliveries (Table 3).

DISCUSSION:

Caesarean sections have been shown to provide benefits, but there are also recognized hazards, such as hemorrhage, infection, difficulties from anesthesia, and even death. Other factors that may impact subsequent pregnancies include uterine rupture, aberrant placentation, and early birth.¹¹ Women who were residing in areas with little resources and have insufficient access to high-quality obstetric care are more vulnerable. Thus, in order to optimize outcomes, hospitals should start a comprehensive and intensive examination of their obstetric population. This classification system enables monitoring and auditing inside an organization and may prove to be a valuable resource in a range of scenarios.¹²

Instead of aiming for a specific rate, efforts should be made to perform CS on women only when it is necessary. The Robson classification system is recommended by the World Health Organization (WHO) as a consistent standard for

evaluating, monitoring, and comparing cumulative CS rates within and between healthcare institutions. Our department used Robson's Ten Group Classification System for the current study to demonstrate how useful and approachable it is for identifying the critical parameters impacting the CS rate.¹³ This made it possible for us to create effective intervention strategies to stop this rate from rising.

The rate of cesarean sections in our research was 29.5%, which is significantly higher than what the WHO advises. However, research conducted at other Pakistani tertiary institutions showed far higher C section rates: 33% in Islamabad, 49% in Karachi, and 54% in Rawalpindi.¹⁴⁻¹⁶ In addition, a study carried done in five hospitals in South Asia found that 36% of C-sections were performed overall¹⁷. Group 3 provided the most to the obstetric population in our study, accounting for 49.3% of all births, as we found after examining the population type. Groups 1 (19.72%) and 5 (10.65%) contributed the next largest percentages. Groups 1 (17.1%), Group 5 (21.4%), and Group 3 (30.7%) were the most prevalent groups in Gilani et al.'s study.¹⁸

Khan MA et al. found that the majority of obstetric patients belonged to Groups 2 and 5, which contradicts our findings.¹⁹ According to Dhodapkar SB et al., group 2 and group 5 were the most common groupings, accounting for 19.6% and 33.3% of cases, respectively.²⁰ Every one of these studies shows the trends in the associated institutions' delivery case handling procedures.

Multigravidas were found in Groups 01 through 07 of our research sample in greater numbers (57.45%) than primigravidae (32.4%). Two more local studies found similar numbers (70.1% and 29.9%), while a research conducted in Bihar found that multiparous women (55.92%) were more prevalent than nulliparas (44.08%).^{21,22} Of the women, 94.57% had a cephalic fetal presentation, whereas only 5.23% had a malpresentation. These figures are in line with

Table 3: Proportion of Each Robson Groups, CS Rate in Each Group, and their Relative and Absolute Contribution to Overall CS Rate

Robson group	No. of CS in group	No. of women in group	Group CS rate	Absolute group contribution to overall CS rate(%)	Relative group contribution to overall CS rate(%)
1	141	977	18	3.2	9.1
2a	47	159	19.5	0.8	2.4
2b	109	369	22.5	5.5	16.2
3	85	587	14.5	1.3	3.9
4a	29	98	24.5	4.6	13
4b	120	406	21.5	3.2	9.1
5	294	387	76	10.5	30
6	47	159	21.5	3.5	10
7	52	176	29.5	2.6	7.2
8	26	88	22.5	3.4	14
9	20	67	30	1.4	3.4
10	282	754	27.5	6.6	18
Total	1250	4227	29.5	29.5	100

a local study that discovered that, respectively, 93.4% of the women and 6.6% of the unusual presentations.²³ Around the world, there is a noticeable variation in the prevalence of CS. It ranges from 5% in sub-Saharan Africa to 42.8% in Latin America.²⁴ This might be explained by differences in the population's demographics, local obstetric practices and legislation, and the challenges of providing healthcare.

When all is said and done, the rates of CS have increased since 1990. In the Indian research, Group 2—rather than Group 01—was the next prevalent group after Group 5 because of the increased risk of CS associated with induction of labor. Group 5 is frequently thought to have contributed the most to the total CS rate because of its scarred uterus.²⁴ Groups 1, 2, 5, and 10 account for the majority of CS in all worldwide research projects. Group 10, which includes all preterm babies, is the fourth greatest contributor.²⁵ Due to regional differences in labor induction procedures, Groups 1 and 2's contribution appears after Group 5's in a number of studies. Future research must concentrate on these four areas in order to optimize the CS rate.

The vaginal delivery after caesarean section is decreasing because of concerns for uterine rupture, even though RCOG guidelines support the safety of VBAC in carefully chosen instances.²⁶

In our study, the stillbirth rate was 24.5/1000 live births, which is far less than Pakistan's stillbirth rate of 43.1/1000 live births. Just 8% of the stillbirths in this research occurred intrapartum, whereas 92% occurred antepartum. The high rate of antepartum stillbirths is indicative of the province's inadequate health system, low socioeconomic status of women, illiteracy, and poverty, as well as of their inability to access health facilities for adequate prenatal care.

The high sample size and full data availability for analysis are two of this study's strengths. The study's findings may be used as baseline information to track changes in our institution's CS rate over time.

Our study has very few limitations. We define fetal viability as a birth weight of 1,000 g or a gestation length of 28 weeks. This may have an effect on the proportionate size of Robson's groups and the rate of CS. We now understand exactly "who" is receiving CS, but not "why," at the time of the procedure. The limitations of our research stem from the omission of important components such as maternal and perinatal outcomes and indications.

CONCLUSION:

The concerning global raise in the rate of cesarean sections is cause for significant concern since it depletes surgical health resources and is linked to major consequences for the fetus and mother. The Robson's classification is a helpful tool because it identifies the main groups that contribute to the CS rate and makes recommendations for interventions and strategies based on those findings. This allows for the

optimization of the CS rate, with the main objectives being the reduction of primary CS and, when practical, the encouragement of women to participate in TOLAC.

Authors Contribution:

Maimoona Qadir: Data collection, analysis, compilation proof reading

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