

Analysis of Caesarean Sections Using Robson 10 Group Classification System

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Abstract

Objective: To determine the frequency of deliveries conducted and different Robson 10 group classification system in patients who undergo lower segment cesarean section in patients presenting in labour at term.

Methodology: The descriptive cross-sectional study was carried out at Department of Obstetrics & Gynecology, Lady Aitchison Hospital, Lahore, from August 2021 to February 2022. Women aged 18 to 40 years with parity of less than 5, presenting after 37 weeks of gestation were included. Informed consent and demographic information (name, age, parity, gestational age & BMI) was obtained. Then females were followed-up till delivery. All pertinent information, including mode of delivery, Robson 10 group classification, and other relevant data, was documented using a standardized proforma. Data was entered and analyzed in SPSS version 20.

Results: Mean age of patients included in this study was 26.70±3.73 years. Cesarean section was done in 48 (24.00%) and vaginal delivery was occurred in 152 (76.00%) patients. On frequency of Robson 10 group, 33 (16.5%) patients were found had Robson group 1, 25 (12.5%) had Robson group 2, 31 (15.5%) had Robson group 3, 34 (17.0%) had Robson group 4, 17 (8.5%) had Robson group 5, 08 (4.0%) had Robson group 6, 08 (4.0%) had Robson group 7, 13 (6.5%) had Robson group 8, 13 (6.5%) had Robson group 9 and 18 (9.0%) had Robson group 10. There was strong association of Robson 10 group with cesarean section (p-value <0.001).

Conclusion: Robson 10 group classification is a reliable tool for predicting the CS rates. The Robson 10 group was the leading contributor to the overall CS rate.

Key Words: Caesarean section, Robson 10 group classification system.

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Introduction

Cesarean deliveries (CS) have become more prevalent in both developed and developing nations, prompting valid concerns about their suitability.¹ Cesarean section (CS) births typically necessitate an extended recovery period, leading to prolonged hospital stays for women compared to vaginal delivery.² Several approaches have been suggested to minimize unnecessary healthcare expenses linked to childbirth.^{2,3} There is worldwide apprehension regarding the increasing rate of cesarean sections (CS), especially pronounced in numerous middle- and high-income nations, albeit to a lesser

extent in low-income countries.^{4,5} The reasons behind the escalating CS rates remain a topic of debate. Some authors attribute factors such as fear of legal action, evolving maternal demographics, the adoption of electronic fetal monitoring, and shifts in professional practice approaches as potential contributors.⁴⁻⁶ While cesarean section (CS) can be crucial for preserving the life of the fetus, the mother, or both in specific instances, it should only be performed under optimal circumstances and when there is a valid obstetrical reason.

Nonetheless, both immediate and long-term complications of cesarean section (CS) encompass heightened risks of maternal morbidity and mortality,

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postpartum hemorrhage, elevated necessity for blood transfusion, extended hospital stays, postpartum infections, and instances of retained and adherent placenta.^{7,8} The World Health Organization advocates for employing the Robson ten-group classification system as a proficient method for monitoring and analyzing the utilization of cesarean sections. The Robson ten-group classification offers a straightforward means of gathering data on cesarean section rates. It serves as a valuable clinical tool, enabling standardized comparisons of data across different time points, while also pinpointing the specific groups that influence changes in cesarean section rates.⁴ It is endorsed as a valuable monitoring tool for comparing cesarean section (CS) rates and pinpointing specific groups for intervention efforts aimed at lowering these rates. As per the research findings, Robson groups 3, 5, and 1 were identified as the primary factors driving the overall cesarean section rate. Indications such as fetal compromise, obstructed labor, and prior cesarean section were cited as reasons for performing cesarean sections. Further investigation is warranted to evaluate the suitability of these indications and to lower the rate of cesarean sections among low-risk groups, particularly groups 1 and 3.⁹ However, contrasting findings emerged from alternative studies. In the study hospitals, women categorized in groups 5, 8, and 10 constituted the primary drivers of the overall cesarean section rate.

Addressing discrepancies in obstetric care across hospitals necessitates a focus on elevating the rate of vaginal births after cesarean section and diminishing primary cesarean sections in cases of multiple pregnancies and preterm labor.¹⁰ Furthermore Tanaka and Mahomed observed that out of 2625 pregnant females, 23.5% underwent cesarean section.¹¹

According to Robson classification, cesarean section occurred in 1.9% cases of class 1, 28.1% in class 2, 2.9% in class 3, 16.6% in class 4, 76.5% in class 5, 91.3% in class 6, 89.7% in class 7, 52.6% in class 8, 100% in class 9 and 24.2% in class 10.¹¹ In another study it has been observed that out of 2545 pregnant females, 20.3% underwent cesarean section. According to Robson classification, cesarean section occurred in 13% cases of class 1, 8.1% in class 2, 2.6% in class 3, 61% in class 4, 58.2% in class 5, 90.9% in class 6, 90.2% in class 7, 70.2% in class 8, 100% in class 9 and 80.8% in class 10.¹² Based on the aforementioned controversial findings, the rationale behind this study is to investigate the prevalence of cesarean deliveries and their frequency among females classified under different

Robson 10-group categories. Existing literature indicates a rising trend in cesarean section rates attributed to various factors, particularly notable in Asian countries. However, there remains a gap in evidence concerning the utility of the Robson ten-group classification system. It is unclear whether this classification system can effectively identify indications for cesarean delivery and aid in preparing patients mentally for their chosen mode of delivery. Through our analysis, we aim to contribute valuable insights to improve decision-making processes regarding cesarean section interventions and promote optimal outcomes for both mothers and babies.

Methodology

This descriptive cross-sectional study, was done at the Department of Obstetrics & Gynecology, Lady Aitchison Hospital, Lahore. Duration of the study was 15-Aug-2021 to 14 Feb 2022. Sample size of 200 females is calculated with 95% confidence level, 6% margin of error and taking expected percentage of cesarean section i.e. 23.5% pregnant females presenting in active labor for delivery.⁷

Non-Probability, Consecutive Sampling technique was used. Women aged 18-40 years, parity <5, presenting after 37 weeks of gestation (on LMP) in active labor (with painful uterine contractions and cervical dilation of >4cm) were included. Patients with congenital fetal anomalies, history of laparotomy for uterine rupture and with BMI >35kg/m² were excluded. Then females were followed-up till delivery. Females underwent cesarean section if there was should dystocia, cephalopelvic disproportion, reduced labor pains, meconium, abnormal CTG detected during labor. Cesarean sections were done under spinal anesthesia by researcher and frequency of cesarean were noted. Females who underwent cesarean sections were subsequently screened for classification under the Robson 10-group system to categorize them based on obstetric characteristics. All pertinent information, including mode of delivery, Robson 10 group classification, and other relevant data, was documented using a standardized proforma. Data was entered and analyzed in SPSS version 20.

Results

Mean age of patients included in this study was 26.70±3.73 years. Minimum age was 18 year and maximum age was 40 years. Mean BMI of patients was 28.59±5.53 kg/m², and mean gestational age of patients was 39.99±1.20 weeks. Out of all, 14.0% women had a parity of 1, 31.0% had a parity of 2, 43.50% had a parity

of 3, and 11.50% had a parity of 4. Cesarean section was done in 48 (24.00%) and vaginal delivery was occurred in 152 (76.00%) patients. Table. I

Table I: Descriptive statistics of age, G. Age and BMI n=130

Statistics	Age	G. age	BMI
Mean	26.70 years	39.99 weeks	28.59 kg/m ²
SD	3.73 years	1.20 weeks	5.53 kg/m ²
Minimum	18 years	38 weeks	16.20 kg/m ²
Maximum	40 years	42 weeks	39.10 kg/m ²
Parity	I	28	14.0%
	II	62	31.0%
	III	87	43.5%
	IV or more	23	11.5%
Mode of delivery	NVD	48	24.0%
	C-section	152	76.0%

In the Robson 10 group classification, the percentages of patients in each group was mention in figure 1.

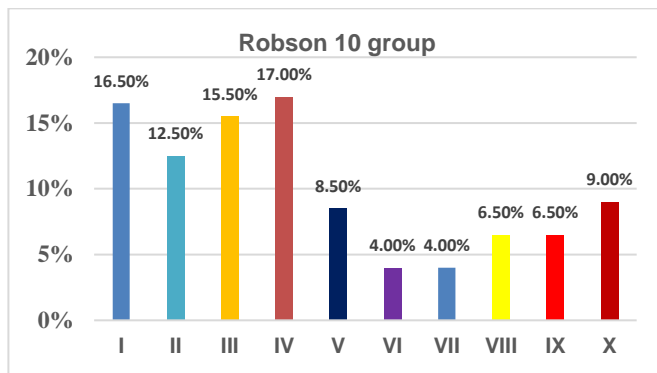


Fig. I. Frequency of Robson 10 group n=200

In the Association of Robson 10 group with cesarean section (n=200), the percentage of cesarean sections varies across the groups. Group 1 had the lowest percentage of cesarean sections at 2.1%, while Group 10 had the highest at 33.3%. There is a significant difference between the groups, with a p-value of less than 0.001. Table. II

Table II. Association of Robson 10 group with cesarean section (n=200)

Robson 10 Group	Cesarean Section		P-Value
	Yes	No	
1	01 (2.1%)	32 (21.1%)	<0.001
2	01 (2.1%)	24 (15.8%)	
3	01 (2.1%)	30 (19.7%)	
4	03 (6.3%)	31 (20.4%)	
5	02 (4.2%)	15 (9.9%)	
6	03 (6.3%)	05 (3.3%)	
7	04 (8.3%)	04 (2.6%)	
8	07 (14.6%)	06 (3.9%)	
9	10 (20.8%)	03 (2.0%)	
10	16 (33.3%)	02 (1.3%)	

According to the association of Robson 10 group with cesarean section among 200 participants, categorized by age groups. In the 18-27 years age group, for

instance, in Robson Group 1, 4.2% underwent cesarean section while 23.9% did not, with a significant p-value of 0.001. In the same age group, Robson Group 2 had no cesarean cases, while 13.6% in Group 3, 17.0% in Group 4, 19.3% in Group 5, 11.4% in Group 6, and so forth, underwent cesarean sections. Similar patterns were observed in the 28-40 years age group, with varying percentages of cesarean sections across Robson groups and significant p-values. (Table. III)

Table III: Association of Robson 10 group with cesarean section according to age. (n=200)

Age groups	Robson 10 Group	Cesarean Section		P-Value
		Yes	No	
18-27 Years	1	01 (4.2%)	21 (23.9%)	0.001
	2	0	12 (13.6%)	
	3	01 (4.2%)	15 (17.0%)	
	4	01 (4.2%)	17 (19.3%)	
	5	01 (4.2%)	10 (11.4%)	
	6	02 (8.3%)	04 (4.5%)	
	7	01 (4.2%)	0	
	8	03 (12.5%)	04 (4.5%)	
	9	07 (29.2%)	03 (3.4%)	
	10	07 (29.2%)	02 (2.3%)	
28-40 Years	1	0	11 (17.2%)	0.001
	2	01 (4.2%)	12 (18.8%)	
	3	0	15 (23.4%)	
	4	02 (8.3%)	14 (21.9%)	
	5	01 (4.2%)	05 (7.8%)	
	6	01 (4.2%)	01 (1.6%)	
	7	03 (12.5%)	04 (6.3%)	
	8	04 (16.7%)	02 (3.1%)	
	9	03 (12.5%)	0	
	10	09 (37.5%)	0	

Discussion

In recent decades, there has been a notable global increase in the rate of cesarean sections (CS), reaching unprecedented levels. While there isn't a universally recommended CS rate, it's been observed that maternal and neonatal outcomes do not necessarily improve with CS rates surpassing 10%.¹³ Various authors have developed and proposed different classification systems for cesarean sections, aiming to provide facilities with consistent and standardized frameworks for evaluating CS practices. This study aimed to assess the frequency of cesarean sections according to the Robson 10 classification system. The study population had an average age of 26.70 ± 3.73 years, with an average BMI of 28.59 ± 5.53 kg/m², and an average gestational age of 39.99 ± 1.20 weeks. When compared to findings by Charoonwatana T et al., it was observed that the average age was 30 years for cesarean section (CS) and 27 years for normal delivery (ND). Similarly, the mean BMI was recorded as 28.6 kg/m² for CS and 27.2

kg/m² for ND.¹⁴ Despite these nuances, our results closely resemble those reported by Mushtaq N et al,¹⁵ where the average age was 30.67 years with a standard deviation of 4.36 years, and the mean gestational age was 38.44 weeks with a standard deviation of 1.161 weeks. Notably, the majority of women (93.79%) in their study delivered at term, with gestational ages falling within the 37 to 40-week range.¹⁵ Other studies conducted by Geze S and Rukewe A et al. also reported findings that closely resembled or partially resembled our study regarding demographic characteristics, including age and gestational age.^{16,17} This consistency across studies underscores the reliability of our findings and reinforces the importance of understanding demographic and obstetric characteristics in assessing cesarean section outcomes.

In this study among patients who underwent CS, 01 (2.1%) patients had Robson group 1, 01 (2.1%) had Robson group 2, 01 (2.1%) had Robson group 3, 03 (6.3%) had Robson group 4, 02 (4.2%) had Robson group 5, 03 (6.3%) had Robson group 6, 04 (8.3%) had Robson group 7, 07 (14.6%) had Robson group 8, 10 (20.8%) had Robson group 9 and 16 (33.3%) had Robson group 10. Tanaka and Mahomed observed that out of 2625 pregnant females, 23.5% underwent cesarean section. According to Robson classification, cesarean section occurred in 1.9% cases of class 1, 28.1% in class 2, 2.9% in class 3, 16.6% in class 4, 76.5% in class 5, 91.3% in class 6, 89.7% in class 7, 52.6% in class 8, 100% in class 9 and 24.2% in class 10.¹¹ Kazmi et al., observed that out of 2545 pregnant females, 20.3% underwent cesarean section. According to Robson classification, cesarean section occurred in 13% cases of class 1, 8.1% in class 2, 2.6% in class 3, 61% in class 4, 58.2% in class 5, 90.9% in class 6, 90.2% in class 7, 70.2% in class 8, 100% in class 9 and 80.8% in class 10.¹² Yadav et al in their study showed that group 1 contributes the largest (37.6%) to the overall CS rates and Group 3 contributes the second largest (15%).¹⁸

Also, in a study conducted in Ethiopia Group 3 and Group 1 contributed the maximum to CS rates (21.3% and 19.3% respectively).¹⁹ On the other hand, Abubeker FA et al²⁰ reported that the primary contributors to the total cesarean section (CS) rate included Group 10 (19.1%), Group 2 (18.3%), Group 5 (17.1%), and Group 4 (15.8%). Additionally, there was a notable prevalence of pre-labor cesarean sections observed in Group 2, Group 4, and Group 10.²⁰ Although the Abdo AA et al²¹ revealed that the total cesarean section (CS) rate stood at 32.8% and the primary factors influencing this rate

were as follows: Robson group 1, accounting for 22.9%; group 5, with 21.4%; and group 3, contributing 17.3%.²¹ Furthermore, Nazeer S et al.²² identified groups 10 and 5 as the primary contributors to the overall Cesarean Section rate. It is crucial to delve into the specific reasons within each contributing group and further classify them accordingly. This approach would aid in reducing unnecessary Cesarean Sections by addressing precise factors.²² However, our findings may exhibit disparities when compared to other studies, primarily due to variations in sample size, geographical locations, and discrepancies in antenatal care, including gaps in delivery services and inadequate nutritional status, particularly prevalent in our population. Despite these limitations, our study also has its constraints, such as a limited sample size. Additionally, it does not differentiate Cesarean Sections performed for specific conditions, such as major placenta previa, or those carried out at the maternal request. Moreover, it fails to distinguish Cesarean Sections conducted for medical or other obstetric complications in the mother, as well as those performed for fetal indications, such as anhydramnios. However, further large-scale population studies are recommended, taking into account the limitations of previous studies, to obtain conclusive results for the implications.

Conclusion

In conclusion, the Robson 10 group classification emerges as a dependable instrument for forecasting Cesarean Section (CS) rates. Our study highlights the significant contribution of the Robson 10 group to the overall CS rate, underlining its pivotal role in obstetric management. Given its effectiveness, we advocate for the more comprehensive research for the implementation of the Robson 10 group classification system in hospitals across Pakistan. By doing so, we anticipate a reduction in the frequency of unnecessary CS procedures among low-risk groups, thus promoting safer and more appropriate childbirth practices.

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