Analysis of Cesarean Sections Using Modified Robson Classification in a Tertiary Care Setup in Pakistan

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ABSTRACT

Objective: To determine the frequency and rate of cesarean section in different groups of pregnant females classified according to Robson classification.

Study Design: Analytical cross-sectional study.

Place and Duration of Study: Department of Obstetrics and Gynecology, Pak Emirates Military Hospital, Rawalpindi Pakistan, from Apr to Sep 2022.

Methodology: A total of 173 pregnant females fulfilling the selection criteria were enrolled after taking written informed consent. At baseline, Robson classification was used, and all females were divided into 10 groups with delivery via cesarean section in each group noted and findings subjected to statistical analysis.

Results: The mean age of 173 female patients was 30.98 ± 5.72 years. Using Robson's classification, 17(9.8%) were classified in Group 1, 13(7.5%) in Group 2a, 2(1.2%) in Group 2b, 22(12.7%) in Group 3, 4(2.3%) in Group 4a, 3(1.7%) in Group 4b, 12(6.9%) in Group 5a, 15(8.7%) in Group 5b, 47(27.2%) in Group 5c, 5(2.9%) in Group 6, 7(4%) in Group 7, 1(0.6%) in Group 8a, 1(0.6%) in Group 8b, 3(1.7%) in Group 8c, 2(1.2%) in Group 9 and 19(11%) in Group 10. Cesarean section (CS) was done in 44.1% females. According to Robson's classification, the majority of the females who had CS were in 5, 3 and 10 groups.

Conclusion: We found a CS rate of 44.1%, predominantly driven by Robson's Group 5(42.8%), 3(12.7%), and 10(11%). Key contributing factors included prior CS scars, fetal distress, failed induction, and meconium-stained liquor. Targeted education for nulliparous and multiparous women without prior CS could reduce non-medically indicated CS rates and mitigate future procedural reliance.

Keywords: Birth, Cesarean Section, Robson's Classification.

How to Cite This Article: Mahmood F, Choudry A, Riaz T, Shehzadi H, Mahmood A, Muzaffar T. Analysis of Cesarean Sections Using Modified Robson Classification in a Tertiary Care Setup in Pakistan. Pak Armed Forces Med J 2025; 75(1): 36-40. DOI: <u>https://doi.org/10.51253/pafmj.v75i1.9774</u>

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INTRODUCTION

One of the most important decisions that obstetricians must undertake is whether pregnancy should be terminated before natural labor begins for which the cesarean section (CS) was developed as a life-saving technique to prevent maternal and fetal life, due to which it is currently the most often performed obstetric procedure.¹ The World Health Organization (WHO) recommended a CS rate of 10-15% in 1985,² however, due to the potential maternal and neonatal hazards, CS rates have continued to climb globally in recent decades, becoming a serious public health concern.² Additionally, increased blood transfusions, uterine scar rupture, placenta accreta, placenta previa, and hysterectomies are all linked to an increase in the CS rate but to date, there is no standard approach for assessing cesarean deliveries.³ As a result, comparing data has become challenging as there is no scientifically verified categorization system to observe and compare cesarean rates due to which the WHO advocates using Robson's classification as an adequate CS classification system.⁴ In addition to CS, the Robson criteria serves as a starting point within which additional epidemiological factors and outcomes can be examined as the Robson classification system makes it simple to get data.⁵ The classification aids in the identification of broad types of pregnant women who can be targeted to minimize the rate of CS.6,7 This classification method is adaptable, and improvements can be made to satisfy institutional and patientspecific needs.7-10 Therefore, the rationale of the current study was to determine the frequency and to compare the rate of CS in different groups of pregnant females at a tertiary care hospital.

METHODOLOGY

This was a cross-sectional study carried out at the Pak Emirates Military Hospital (PEMH), Rawalpindi, Pakistan, for a duration of six months from April to September 2022, after taking approval from

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the Ethical Review Committee (ERC number A/28/EC/434/2022). The sample size was calculated using Raosoft software, keeping 95% confidence level and 7% margin of error, taking expected percentage of cesarean section as 33.3% according to Robsons criteria,¹ giving a sample size of 173. Non-probability consecutive sampling technique was used to enroll the required sample size.

Inclusion Criteria: All pregnant females of >35 weeks gestation who were coming to the hospital for delivery and were between 18-45 years of age, were included in the study.

Exclusion Criteria: Females who underwent hysterotomy, hysterectomy or any other gynecological procedure and who underwent termination of pregnancy were excluded from the study.

A total of 392 pregnant females who fulfilled the selection criteria were enrolled in the study after taking written informed consent. Demographic details, clinical history and examination of all patients was noted. At baseline, Robson classification was used and all females were grouped into groups of 10 depending on the clinical characteristics at the time of presentation. The frequency of CS performed in each group was noted and compared within different groups and findings were subjected to statistical analysis. The data was analyzed through Statistical Package for Social Sciences (SPSS) version 22.0. Quantitative variables such as age, gestational age were presented as mean and standard deviation. Qualitative variables such as parity, previous CS, onset of labor, fetal presentation, number of fetuses, gestational age group, Robson classification group, cesarean section on current presentation, reasons of CS in Primigravida and in those with previous one scar were presented as frequency and percentages.

RESULTS

Data from a total of 173 females was analyzed and the mean age was found to be 30.98 ± 5.72 years and the mean gestational age at the time of presentation was 38.03 ± 1.068 weeks. Primary CS was carried out in 69(17.6%) females and secondary CS was done in 104(26.5%) females. There were 114(65.9%) primigravida and 59(34.1%) multigravida while 123(71.1%) were nulliparous females and 50(28.9%) were multiparous females. History of the previous one scar was present in 43(11%) females, onset of labor occurred in 20(17.3%) females and 136(78.6%) had cephalic presentation and 37(21.4%)had breech presentation. Single fetus was present in 162(93.6%) patients and multiple fetuses were present in 11(6.4%). According to gestational age, 22(12.7%) females were of <37 weeks of gestation, 145(83.8%) were of 37 to 40 weeks gestation and 6(3.5%) females were of >40 weeks gestation. Further demographic details are listed in Table-I. According to Robson's among patients who underwent classification, cesarean section, 17(9.8%) were classified in Group 1, 13(7.5%) were classified in Group 2a, 2(1.2%) were classified in Group 2b, 22(12.7%) were classified in Group 3, 4(2.3%) in Group 4a, 3(1.7%) in Group 4b, 12(6.9%) in Group 5a, 15(8.7%) in Group 5b, 47(27.2%) in Group 5c, 5(2.9%) in Group 6, 7(4%) in Group 7, 1(0.6%) in Group 8a, 1(0.6%) in Group 8b, 3(1.7%) in Group 8c, 2(1.2%) in Group 9, 8(4.6%) in Group 10b and 11(6.4%) in Group 10c as shown in Table-II.

Table-I: Frequency of Demographic Variables (n=173)

Variables	n(%)
Type of Cesarean Section	
Primary	69(17.6%)
Secondary	104(26.5%)
Gravidity	
Primigravida	114(65.9%)
Multigravida	59(34.1%)
Parity	
Nulliparous	123(71.1%)
Multiparous	50(28.9%)
History of Previous One Scar:	
Yes	43(11%)
No	349(89%)
Onset of labor	·
Yes	30(17.3%)
No	143(82.7%)
Fetal Presentation:	
Cephalic	136(78.6%)
Breech	37(21.4%)
Number of Fetuses:	· · ·
Single	162(93.6%)
Multiple	11(6.4%)
Gestational Age Group:	
<37 weeks	22(12.7%)
37 to 40 weeks	145(83.8%)
>40 weeks	6(3.5%)
Robson's Classification of Cesarea	n Section
Group 1	17(9.8%)
Group 2a	13(7.5%)
Group 2b	2(1.2%)
Group 3	22(12.7%)
Group 4a	4(2.3%)
Group 4b	3(1.7%)
Group 5a	12(6.9%)
Group 5b	15(8.7%)
Group 5c	47(27.2%)
Group 6	5(2.9%)
Group 7	7(4%)
Group 8a	1(0.6%)
Group 8b	1(0.6%)
Group 8c	3(1.7%)
Group 9	2(1.2%)
Group 10b	8(4.6%)
Group 10c	11(6.4%)

NIDICATIONIC		ROBSON5' CLASSIFICATION GROUP															
INDICATIONS	1	2a	2b	3	4a	4b	5a	5b	5c	6	7	8a	8b	8c	9	10b	10c
Previous 2 or	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	31/17 0%)	0(0%)	0/0%0	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)
more scars	0(0.%)	0(0 /6)	0(0 %)	0(0.6)	0(076)	0(0 %)	0(076)	0(0.6)	51(17.5%)	0(0.6)	0(0.00	0(0.%)	0(0.6)	0(0.8)	0(0.6)	0(0.6)	2(1.2.%)
Unwilling for TOLAC	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	3(1.7%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
PPROM>24 hours	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	2(1.2%)	0(0%)
Good sized baby	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	3(1.7%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
CPD	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	1(0.6%)	0(0%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)
Short	L Ó	È É	L Ó	L Ó	, í		, í	, í	, í	. ,	, í	. /	, í	L Ó	, í		<u>, , , , , , , , , , , , , , , , , , , </u>
interpregnancy interval	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Bad OBS History	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Severe preeclampsia	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
History of hysterotomy	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Failed IOL	0(0%)	6(3.5%)	0(0%)	0(0%)	4(2.3%)	0(0%)	0(0%)	8(4.6%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Scar tenderness	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	7(4%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Fetal distress	10(5.8%)	4(2.3%)	0(0%)	3(1.7%)	0(0%)	0(0%)	4(2.3%)	0(0%)	0(0%)	2(1.2%)	2(1.2%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)
Meconium stained liquor	7(4%)	3(1.7%)	0(0%)	4(2.6%)	0(0%)	0(0%)	3(1.7%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)
Primary																	
dysfunctional	0(0%)	0(0%)	0(0%)	3(1.7%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
labor																	
Poor bishop	0(0%)	0(0%)	1(0.6%)	5(2.9%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Tears in																	
previous	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
pregnancy																	
Unstable lie	0(0%)	0(0%)	0(0%)	3(1.7%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
Cord presentation	0(0%)	0(0%)	0(0%)	2(1.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%	0(0%)
Placenta previa	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	0(0%)	2(1.6%)
Abruption	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.6%)
Eclampsia	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)
Raised doppler indices	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)
severe oligohydramnios	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)	1(0.6%)
Absent diastolic flow	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(0.6%)
Severe preeclampsia	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	2(1.2%)	0(0%)
uncontrolled GDM	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	3(1.7%)	0(0%)
Precious	0(0%)	0(0%)	1(0.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)

Table-II: Frequency of Indications of Cesarean Section based on Robson's Classification (n=173)

DISCUSSION

The current study results revealed that cesarean section was carried out in 44.1% females according to Robson's classification. According to Robson's classification, CS was more frequently carried out in females who were classified in Group 5(42.8%), 3(12.7%), 10(11%), 1(9.8%) and 2(8.7%). The frequently common reasons for cesarean section were previous 2 or more scars, fetal distress, failed Induction of Labour and meconium-stained liquor. To balance the risks and advantages of CS, the WHO has recommended a CS rate of less than 15%.^{11,12} Rising trends in CS rates are feared to be a result of malpractice, labor induction without warning, a lower threshold for labor pains, a lower level of skill in using instrumental delivery

methods, and maternal requests.^{13,14} In order to identify potential areas for development and lower overall CS rates, it is crucial to continuously evaluate CS rates over time and compare them to historical data.^{15,16} In the current study, the commonest Robson's classification groups of CS were Group 5, 3 and 10 with 42.8%, 12.7% and 11% respectively. One study revealed that the commonest group according to Robson's classification was Group 2 and Group 5,¹⁷ while another study revealed that females who underwent CS belonged mainly to Group 5(13.8%), followed by Group 1(4.8%) and Group 2(4.2%).¹ These studies support our findings that females falling in Group 5 were more likely to have cesarean section. Another study from Pakistan found that the frequently

encountered groups according to Robson's classification, were Group 10(50.9%), 5(14.4%) and 1(11.4%),¹⁸ while a study from India reported that the commonest Groups were 1(33.3%), 5(19.7%) and 2(14.6%),¹⁹ and a study conducted in Singapore reported that the commonest Groups encountered were group 2, 5 and $10.^{20}$ This difference may be because of different geographical and obstetrical practices and because our setup is a tertiary care hospital receiving all high-risk pregnancies from all over the country.

ACKNOWLEDGEMENTS

We would like to thank all of our seniors and our colleagues who helped us in compiling this study, collecting data and performing the relevant literature search.

LIMITATIONS OF STUDY

We were unable to record the prenatal and maternal outcomes of study participants and results of this study cannot be generalized because it was a single-center study with a small sample size over a limited period of time.

CONCLUSION

We found that the rate of cesarean section in our study was 44.1%. According to Robson's classification, the majority of the females who had CS were in Group 5(42.8%), 3(12.7%), 10(11%). Previous 2 or more scars, fetal distress, failed induction of labor and meconium-stained liquor were the common factors that led to this increased rate.

Conflict of Interest: None,

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

FM & AC: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

TR & HS: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

AM & TM: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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