ORIGINAL ARTICLE

ASSESSMENT OF CAESAREAN SECTION RATE USING ROBSON TEN GROUP CLASSIFICATION SYSTEM IN A TERTIARY CARE HOSPITAL: A CROSS SECTIONAL STUDY

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Background: The growing rate of caesarean section is a major concern for quality of maternal life and public health. Concerns about such increases prompted the WHO to recommend Robson ten group classification system for assessing the Caesarean Section rate. The present study's aim was to assess the caesarean rate using Robson's ten group classification system and highlighted the reliable information system, in turn, helps to construct interventions to reduce avoidable caesareans. **Methods:** This cross-sectional study was carried out on 5796 women who delivered from 25th November 2021 to 24th November 2022 in Jinnah Post Graduate medical Centre Karachi. Data was collected from the women admitted for delivery using Robson's *Pro forma*. Relative size and caesarean rate of each group and overall caesarean section rate was calculated. **Results:** Of the total 5796 deliveries, 2141 (36.9%) were caesarean deliveries and 3655 (63.1%) had normal deliveries. Out of Robson's ten groups system, Group 10 had a higher contribution of 705 (12.2%) to the overall caesarean rate followed by group 5 had 627 (10.8%). The contributing prevalence of Group 1, 2, 3, 4, 6, 7, 8 and 9 were 122 (2.1%), 317 (5.5%), 50 (0.87%), 167 (2.9%), 42 (0.72%), 35 (0.6%), 49 (0.85%) and 27 (0.46%) respectively. **Conclusion:** Our study concluded that Group 10 and 5 were the most responsible for the whole Caesarean Section rate. In all contributing groups, there is a need to identify the indications and to sub classify these groups further so that preventable caesarean sections can be avoided by reducing these factors.

Keywords: Caesarean section; Robson classification; Vaginal delivery

Citation: Nazeer S, Rehman M, Khan S, Sadiq S, Bano K. Assessment of caesarean section rate using Robson ten group classification system in a tertiary care hospital: A cross sectional study. J Ayub Med Coll Abbottabad 2023;35(2):275–9.

DOI: 10.55519/JAMC-02-11602

INTRODUCTION

Caesarean section (CS) is one of the most common obstetric procedure performed and has long been considered as an indicator to assess the quality of obstetric care of any institute and country.[1] Although CS is a kind of life-saving technique but also has risks for future pregnancies. There is rising distress about the increased risk of long-term complications after one or more CS such as retained placenta, placenta accreta, and uterine rupture, which may necessitate peripartum hysterectomy.[2] However, without absolute indications, caesarean sections are still performed.

The growing rate of caesarean section is a major concern for quality of maternal life and public health. Concerns about such increases prompted the WHO to publish the statement that Caesarean Section rates should not exceed 10–15%.[3] In Pakistan CS rate increases exponentially in the last 10 years from 14% in 2012–13 to 22% in 2017–18 and still it's on the rise.[4] Globally, the rate of caesarean section is ascending, from 6.7% in 1990 to 21% in 2018. Worldwide, in five countries ((Dominican Republic, Brazil, Cyprus, Egypt and Turkey) the caesarean rate surpasses the vaginal delivery (>50%).[5] If CS continue to rise with same speed then the projected figures will be 63% in eastern Asia and 54% in Latin America[6]. However, on population level, neonatal and maternal mortality reduction have no significant association with an increasing caesarean rate above 10–15%.[7,8] Population living in high social status or urban areas had relatively higher caesarean section rates compared to rural areas or lower social status populations.[8] The increasing morbidity and mortality rate among rural areas are due to a lack of healthcare facilities, equipment, and staff. Maternal and foetal lives might be endangered when a caesarean section is tended to avoid where spontaneous vaginal delivery is severely restricted.[6,9] In view of this, in 2015, WHO revisited its statement and published that "Every effort should be made to provide caesarean sections to women in need, rather than striving to achieve a specific rate".[10] To achieve this WHO recommended Robson Ten Group Classification System as an international standard to monitor caesarean section.[11,12] This classification system was introduced by M. Robson in 2001.[13] Gestational age, previous obstetric history, presentation and lie, induction or spontaneous labour, singleton or multiple, are various aspects based on which CS are divided into ten groups known as RTGCS.[14] The present study is aimed to conduct an analysis of caesarean section using Robson Ten Group Classification System and to highlight the importance of a reliable information system. The rationale of the study

is to get the insight regarding which groups participated more and it will help us to construct interventions to reduce avoidable caesareans so that global and national issue of precipitating rise of caesareans can be addressed on hospital basis.

MATERIAL AND METHODS

This cross-sectional study was carried out on 5796 women who delivered at the Department of Obstetrics and Gynaecology in Jinnah Post Graduate medical Centre, Karachi from 25th November 2021 to 24th November 2022. Prior to the study conduction, the institutional ethical committee approved this research (Ref: No.F.2-81/2021-GENL/70207/JPMC, Dated: 22-11-2021). Written Informed consent was taken from all the women who underwent delivery either normal vaginal delivery or caesarean section, during the study period. They were informed that confidentiality will be maintained by keeping the personal information private and data will be used for the study. Sampling technique was non probability consecutive sampling. Women who admitted for delivery were assigned one of the Robson group on presentation and data collected using *pro forma*. Previous history of CS and parity, single or multiple foetuses, vaginal or CS delivery mode, gestational age, cephalic or transverse, term or preterm, birth weight, were all considered. Uterine rupture laparotomies and deliveries before foetal viability were excluded. A total of 2141 caesarean cases were examined in this study. Medical records were revised to gather pertinent obstetric information. Last Menstrual period or first trimester ultrasound was taken for gestational age calculation. Birth weight was utilized to indicate gestational age where there is absolute no history or scan available. Birth weights less than 2500 g were considered preterm, while birth weights greater than it, were considered term. For data analysis, SPSS version 26 was used. First, the institutional overall CS rate was computed. The size of each group, caesarean rate of each group and absolute and relative caesarean section rate was calculated in terms of frequencies and percentages using descriptive statistics.

RESULTS

The overall mean age of the patients was 33.61±4.53 years with an age range from 16 years to 45 years. All the women were categorized into three age groups; group I having <20 years' age, group II 21-35 years, and group III >35 years. Of the total 5796 deliveries, 2141 (36.9%) were caesarean deliveries and 3655 (63.1%) had normal deliveries. Out of Robson's ten groups system, Group 10 had a higher contribution of 705 (33%) to the overall caesarean rate followed by group 5 had 627 (29.3%) while group 9 had a lower contribution of 27 (1.2%). The contributing prevalence of Group 1, 2, 3, 4, 6, 7, and 8 were 122 (2.1%), 317 (5.5%), 50 (0.87%), 167 (2.9%), 42 (0.72%), 35 (0.6%), and 49 (0.85%) respectively. Table-1 shows the Robson 10 group categorical system. Figure-1 demonstrates the age wise distribution of all the women. Obstetric details of the participants are shown in Table-2. The percentage of Robson's each group, within group CS rate, and their contribution (absolute and relative) to the whole CS rate are reported in Table-3.

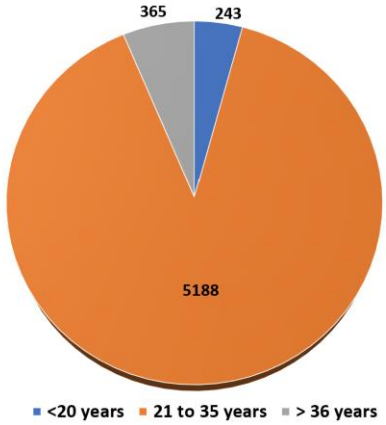

Figure-1: Age wise distribution of the participants

Table-1: Robson 10 group Classification system.

Groups	Depiction
Group 1	Nulliparous, single cephalic, ≥37 weeks, in spontaneous labour.
Group 2	Nulliparous, single cephalic, ≥37 weeks, induced or caesarean section (CS) before labour.
Group 3	Multiparous, single cephalic, ≥37 weeks, in spontaneous labour.
Group 4	Multiparous, single cephalic, ≥37 weeks, induced or CS before labour.
Group 5	Previous CS, single, cephalic, ≥ 37 weeks.
Group 6	All nulliparous breeches
Group 7	All multiparous breeches (including previous CS).
Group 8	All multiple pregnancies (including previous CS).
Group 9	All abnormal lies (including previous CS)
Group 10	All single cephalic(including previous CS), ≤ 37 weeks

Table-2: Obstetrics details of patients

Parameters	Frequency n	Percentage
Parity		
0	2730	47.1
1–4	2962	51.1
>5	104	1.8
Gestational Age		
<37 weeks	1513	26
>37 weeks	4283	74
Mode of delivery		
Normal Deliveries	3655	63.1
Caesarean Section	2141	36.9
Number of Foetus		
Single	5621	97
Multiple	175	3
Foetal Outcome		
Live Birth	5571	93.3
Stillbirth	401	6.7
Birth Weight (kg)		
< 2.5 Kg	1304	22.5
>2.5 Kg	4492	77.5

Table-3: the percentage of Robson each group, within group CS rate, and their contribution (absolute and relative) to the whole CS rate

Robson Group	Frequency of CS (A)	Frequency of Normal Deliveries	Total number of Women (B)	Group Size (B/D)×100	Group CS rate (A/B)×100	Absolute group contribution (A/D) ×100	Relative Contribution (A/C) ×100
1	122	678	800	13.8	15.3	2.1	5.7
2	317	383	700	12.17	45.3	5.5	14.8
3	50	1186	1236	21.3	4.05	0.87	2.33
4	167	409	576	9.9	29.3	2.9	7.8
5	627	129	756	13.04	83.3	10.8	29.3
6	42	7	49	0.85	85.7	0.72	1.96
7	35	38	73	1.36	48.4	0.60	1.63
8	49	126	175	3.02	28.0	0.85	2.29
9	27	0	27	0.47	100	0.46	1.26
10	705	699	1404	24.4	50.2	12.2	33
Total	2141	3655	5796			36.9%	

C=Total number of caesarean in the study period of 1 year. (n=2141)
D=Total number of women delivered (normal +caesarean) in the study period of 1 year. (N=5796)

DISCUSSION

Caesarean section is an important intervention which is when done judicially lessen the maternal and perinatal mortality, and that is why it acts as proxy of obstetric health system of a nation.[15] However, it is also associated with intraoperative, postoperative and delayed complications like haemorrhage, damage to viscera, anaesthesia related accidents, infection, and even death. Delayed complications include morbid placentation, uterine rupture, pelvic pain and subfertility. Women who live in limited resource areas in terms of obstetric care might have higher risks.[16,17] Rigorous assessment and thorough examinations are need of an hour for outcome improvement. Various settings utilized effective tools like RTGSC for monitoring CS rates.[18]

In the present study, RTGCS was implemented and analysed the proportion of contributing each group to the Caesarean Section rate. In our study, the Caesarean Section rate is 36.9%. This is in comparison to composite caesarean section rate in South Asia in a study conducted by Hassan L.et al, which is 36%.[19] Zijaj L.*et al* also reported the same 39% caesarean rate.[20] Within Pakistan this CS rate is higher than Hayatabad Medical Complex, Peshawar (22%) shown in a study performed by Ali S.*et al*[21] and Abbasi Shaheed hospital, Karachi (26–30%) where Imtiaz R. *et al* directed this study.[22] Khan MA.*et al* reported 64% CS rate in KRL, hospital Islamabad.[23] The high caesarean rate in our setting is because our hospital is tertiary care hospital and receiving the largest number of patients and referrals from all over the province.

The highest contributor to caesarean section among the ten groups was Group 10 which contributes 12% in overall caesarean section rate. Abubeker FA.*et al* in his study also concluded group 10 as one of the prime contributor of caesarean section.[24] A study conducted by Parveen R. *et al* also reported the same group 10 to be the largest contributor among all.[25] However, our findings are in contrast with the study conducted by Gilani S.*et al* in Islamabad in which group 10 is 4th prevalent contributor.[26] Another study which was conducted by Gu J.*et al* contradicts these findings.[27] The possible reason for our group 10 prevalence is that the current study was carried out at a tertiary hospital that has a special interest in multidisciplinary approach. Mothers with major comorbidities like hypertensive disorders, preterm pre labour rupture of membranes, morbidly adherent placenta, women with multiple caesarean sections with impending rupture, intrauterine growth retardation and with medical emergencies presented here either directly or referred and they are treated here (either induced or immediate caesarean) resulting in preterm caesarean deliveries and resultant increase in group 10 caesarean contribution. This is justified by the fact that group 10 has the highest group size indicating that we are receiving majority of the women in this group. Further research into the causes of CS can improve the design for reducing CS interventions.

Group 5 was identified as a second prime contributor to the caesarean section rate as reported in different setting studies.[28–30] Fatima SS.*et al* in her study also concluded group 5 as the major caesarean contributor.[31] If we compare the caesarean section rate on an individual group basis then group 5 CS rate is 83.3% which is higher than group 10 CS rate (50%). Despite the fact that the protection and lasting advantages of normal deliveries following caesarean are healthy recognized, 83% of women had another CS in Group 5 which is mainly due to the fact that we are also dealing with patients with history of multiple caesareans that necessitates repeat caesarean delivery. However, to reduce the caesarean in this group there is a need for strategies of antenatal counselling development and implementation and protocols for labour management, thereby repeat CS reduced.

Regarding groups 1 and 2, many studies[32–34] all over the world reported group 1 and 2 as the major contributor of caesarean section after group 5 which is in contrast to our study where group 1 is the 5th contributor, however group 2 is the 3rd prevalent contributor. The reason for the controlled caesareans in group 1 is that our institution has largest number of post graduate trainees that monitor the labour well and hence reduced number of caesareans whereas in group 2 we induced the patients and many patients have already comorbid that necessitate low threshold for caesarean and hence CS rate increases. Group 1 and 2 are the primary caesarean groups and if we control caesarean in these groups then future increase in group 5 size can be reduced. It can be done by proper monitoring of labour by Partograph, judicial indications of inductions and trainings to read CTG correctly to reduce caesareans due to foetal distress.

Considering groups 3 and 4, group 3 is 2nd largest group with obstetric size of 21%, however it has group CS rate of only 4% that means more than 90% of women in this group delivered normally. This is similar to CS rate provided by Robson and in WHO MCS (multicounty survey).[35] This finding is in contrast to study done by Tura AK.*et al*[8], which may be due to their reason of delivering most multigravida at home or nearby facility and reporting to those hospitals only with complications. However, our group 4 CS rate is nearly 29% which is above the Robson suggested criteria of less than 20%.[36] To reduce caesareans in this group there is again need of proper indication and method of induction and monitoring of labour that will further help to lessen CS in this group.

The strength of this study is the large sample size on which this study is conducted and the limitation of the study is that it is not the representative of caesarean section of the whole country as this study done in a government sector tertiary care hospital and caesarean section rate differ from hospital to hospital due to different variables of the population they are dealing and the care the hospital provides.

CONCLUSION

Our study concluded that Group 10 and 5 was the most responsible for the whole CS rate. The absolute and relative contribution of each group to the whole CS rate were analysed by using the Robson ten group classification system. There is a need to identify the indications and to sub classify these groups further so that preventable caesarean sections can be avoided by reducing these factors.

AUTHORS' CONTRIBUTION

SN: Conceptualization, data collection, data analysis & interpretation, literature search, write-up. MR: Data analysis, write-up, literature search, proof reading. SK: Data interpretation. Write-up, literature search. SS: Data collection, proof reading. KB: Concept, supervision, proof reading.

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Submitted: December 11, 2022	*Revised: December 21,2022*	*Accepted: December 23, 2022*

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