

A Cross Sectional Study of Robsons 10 Group Classification and its Impact on Caesarean Section Rate

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Abstract

Background: Ensuring safe pregnancy and motherhood occupies a pivotal role and is considered as one of the key issues in the framework of Reproductive and Child Health program. Cesarean section continues to be one of the most important surgical interventions performed in obstetric practice. Implementation of Robson's 10 group classification system in various institute, corporate hospitals, tertiary care centers and in various hospital settings will help in knowing exact number of caesarean section rate and limiting the rate of caesarean section in various groups and focus on those group in reducing the caesarean section rate. This classification system will provide the backbone for yearly audits of hospitals. It will help to set up new protocol for hospital settings.

Materials and methods: All pregnant patients coming in the maternity ward for admission were examined. After taking thorough history, examinations of patients were done. Patients were followed during course of labor. Patients who underwent caesarean sections were classified according to Robson's 10 group of classification

Results: Analysis based on Robsons classification showed that Group 5 made the greatest contribution in C sections rate. Group 1 and Group 2 made second and third highest contribution in C section rate as per nulliparous patients Further more we analysed Group

5 almost 85% of women undergone C sections for previous C sections Group 9 has 100% C section rate

Conclusions: Group 1 and Group 2 which consists of nulliparous patients with either spontaneous or induced labour is having more caesarean section rate. More focus should be on these groups to reduce primary caesarean section rate.

Keywords: Caesarian section; Rabson's classification; Pregnancy; Safe delivery.

Introduction

Ensuring safe pregnancy and motherhood occupies a pivotal role and is considered as one of the key issues in the framework of Reproductive and Child Health program. Cesarean section continues to be one of the most important surgical interventions performed in obstetric practice¹ The availability of better anaesthesia, improvised surgical techniques and wide range of prophylactic antibiotics have made caesarean section a relatively safer and a common procedure. Economic factors and fear of litigation are other considerations which may indirectly influence such decisions. More recently the debate has focused on whether a woman has the right to choose to have her baby delivered by caesarean section in the absence of a medical

indication. This has medical implications, in terms of short and long term complications for the woman, but also carries a financial burden that the National Health Service can ill afford.²

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.^{1,2} The caesarean section rates have been increasing steadily over 23 years the rates are different in different areas and in different states of India. The trend of caesarean section analyzed from 1992–93 to 2015–16 shows that there has been upward trend in caesarean section rates in India. All India level of caesarean section rate increased from 2.9% in 1992–93 to 7.1% in 1998–99 to 8.5% in 2005–06 and further increase to 17.2% in 2015–16. CS rate that is relatively high (more than 30 percent) in states like Telangana (58%), Andhra Pradesh (40%), Kerala (35.8%), Tamil Nadu (34.1%), Pondicherry (33.6%) Jammu & Kashmir (33.1%) and Goa (31.4%).³

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.^{3,4}

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 variety of instruments and medico legal aspects.

The rates vary from one hospital to other and one country to other. Analyzing CS rates in different hospitals and resulting accurate reasons of these, can provide important insights into this problem in order to propose and implement effective measures to reduce or increase CS rates where necessary, it is first essential to identify what groups of women are undergoing CS and investigate the underlying reasons for trends in different settings. This requires the implementation of a classification system that can best monitor and compare Caesarean Section rates in a standardized, reliable, consistent and action-oriented manner. Such a classification system should be applicable internationally and useful for obstetrics and public health authorities. Ideally, such a system should be simple, clinically, relevant, accountable, replicable and verifiable.^{5,6}

The 10 group classification complies with the principles described above to make possible comparisons of caesarean section rates over time in one unit and between different units.⁶ This would, if implemented on a continuous basis, allow the possibility of improving perinatal care. The obstetric concepts, with their parameters, used to group and categorize the women in the 10 group classification are the category of the pregnancy, the previous obstetric record of the woman, the course of labor and delivery and the gestational age of the pregnancy. From these concepts and their parameters the 10 groups were formed. The concepts and their parameters are all prospective, mutually exclusive, totally inclusive, simple and easy to understand and organize. They are particularly clinically relevant to midwives and obstetricians because the information they depend on is required whenever an assessment is made of a pregnant woman who is either in labour or about to deliver.⁷

Implementation of Robson's 10 group classification system in various institute, corporate hospitals, tertiary care centers and in various hospital settings will help in knowing exact number of caesarean section rate and limiting the rate of caesarean section in various groups and focus on those group in reducing the caesarean section rate. This classification system will provide the backbone for yearly audits of hospitals it will help to set up new protocol for hospital settings.

Materials and Methods

It was a prospective analytical study, which was carried out among 5745 patients delivered vaginally and underwent caesarean sections in Krishna Institute of medical sciences and hospital Karad during the study period of October 2016 to March 2018. The inclusion and exclusion criteria used in the current study is as follows:

Inclusion criteria

- All pregnant women undergoing cesarean section in the department of obstetrics and gynecology, Krishna hospital.
- All normal delivered patients observed during this period.

Exclusion criteria

- Exclusion criteria were not included in the study. All caesarean sections were included in the study.

Methodology

The present study was conducted after the approval from institutional ethical committee. Due written consents were obtained from the study subjects. All pregnant patients fulfilling the inclusion criteria and coming in the maternity ward for admission were included in the current study and examined. Patients were followed during course of labor. Patients who underwent caesarean sections were classified according to Robson's 10 group of classification in parameters includes following-

- Parity
- Previous Caesarean Sections
- Gestational age
- Onset of labor
- Fetal presentation
- Number of fetuses

Robson's 10 group classification system for caesarean sections

1. Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation in spontaneous labour.
2. Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation who either had labour induced or were delivered by caesarean section before labour
3. Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal 37 weeks in spontaneous labour
4. Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal to 37 weeks gestation who either had labour induced or were delivered by caesarean section
5. All multiparous women, with at least one previous uterine scar and a single cephalic pregnancy at greater than or equal to 37 weeks gestation
6. All nulliparous women with a single breech pregnancy
7. All multiparous women with a single breech pregnancy including, women with previous uterine scars
8. All women with multiple pregnancies, including women with previous uterine scars
9. All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars
10. All women with a single cephalic pregnancy at less than or equal to 36 weeks gestation, including women with previous scars

After taking thorough clinical history, general and systemic examinations of patients, the data was collected with the help of standard, semi-structured, prevalidated case record proforma. The collected data was analysed and presented in the forms of graphs and tables for frequency analysis. MS Excel software was used for the compilation and data entry, whereas SPSS statistical software version 21 was used for data analysis.

Results

In the study most number of patients group is mainly consist of Group 1 and Group 2. Total 47.65% patients belongs to these group.

After these two Group 5 consist of 17.26% of patients mainly due to increase in primary caesarean section rate.

Analysis based on Robsons classification showed that Group 5 made the greatest contribution in C sections rate. Group 1 and Group 2 made second and third highest contribution in C section rate as per nulliparous patients Further more we analysed Group 5 almost 85% of women undergone C sections for previous C sections Group 9 has 100% C section rate.

Tables 1-2 shows that overall most contribution in caesarean section is by Group 5 despite of being third largest group of all patient and being the the group with most number of caesarean sections. This denoted that focus should be more on Group 5 for reducing the rate of caesarean sections. Also primary section rate should be reduced for better further obstetrics career.

Table 1: Distribution of study subjects according to Robson's groups

Group Number	Robson's Ten-Groups Classification	Relative Size of Each Group		Number of CS	
		(N)	%	(n)	%
1.	Nulliparous, single cephalic, >37 weeks in spontaneous labour	1499	26.09%	486	32.42

Group Number	Robson's Ten-Groups Classification	Relative Size of Each Group		Number of CS	
		(N)	%	(n)	%
2.	Nulliparous, single cephalic, >37 weeks, induced or CS before labour	1239	21.56%	650	52.46
3.	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labor	866	15.07%	60	6.92
4.	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	445	7.74%	87	19.55
5.	Previous CS, single cephalic, >37 weeks	992	17.26%	851	85.78
6.	All nulliparous breeches	110	1.91%	92	83.63
7.	All multiparous breeches (including previous CS)	75	1.30%	64	85.33
8.	All multiple pregnancies (including previous CS)	100	1.74%	78	78
9.	All abnormal lies (including previous CS)	27	0.46%	27	100
10.	All single cephalic, <36 weeks (including previous CS)	392	6.82%	194	49.85
Total		5745	100%	2589 (c)	

Table 2: Comparison between Robson's groups and caesarian section.

Robsons 10 Group of Classification	Contribution Made By Each Group in Overall Caesarean Section (%)	% Of Number of C Sections in Each Group ff Overall C Sections (N/C)
Group 1	8.14	18.77
Group 2	11.31	25.10
Group 3	1.04	2.31
Group 4	1.51	3.36
Group 5	14.81	32.86
Group 6	1.60	3.55
Group 7	1.11	2.47
Group 8	1.35	3.01
Group 9	0.46	1.04
Group 10	3.37	7.49
Total	45	100

Discussion

Caesarean section is most frequently performed major surgery in obstetrics. The number and hence the rate of caesarean section has been progressively increasing in recent years. Caesarean section is being done more liberally than before. There are several reasons for dramatic increase in caesarean section rates worldwide. The indications for the caesarean sections has also widened. In modern obstetrics, safe and reliable practice made us the safer approach as a caesarean section.

Caesarean section rates is still a problem of concern for several midwives, obstetricians, women, and society as an entire. With a rise in women requesting caesarean sections, the responsibility for the delivery rate must be re-defined. There's a desire to boost the routine information assortment

on all aspects of parturition. There's conjointly a desire to adopt normal classification systems to compare and improvement of care will surface. This may need statutory, standardized assortment of knowledge. Maternal satisfaction has currently become one in every of the foremost important outcome factors during parturition and should be taken into thought once implementing changes in birth. Finally, delivery rates should not be thought about in isolation from different changes happening in society.

This interest has been greater and for longer, in countries wherever the caesarean delivery rate has been increasing at a quicker rate than in different countries.

The foremost necessary concern concerning associate degree increasing caesarean delivery rate has been the idea that it'd end in a rise in operative

complications with none established profit to either mother or baby. What we want is correct, up-to-date data on an identical and continuous basis that might either justify the increase within the caesarean delivery rates or make sure that there has been a rise in maternal morbidity or mortality. What's most likely true is that, though caesarean sections do involve bound risks, the operation is way safer than it used to be. At a similar time, the magnified awareness of the complications of duct delivery and therefore the increase in women's discontentedness with long labour and vaginal delivery have resulted in obstetricians having a lower threshold for advising delivery by caesarean section.

Robson MS in 2001 proposed a ten group classification system depending upon four parameters

Category of the pregnancy

- Single cephalic pregnancy
- Single breech pregnancy
- Single oblique or transverse lie
- Multiple pregnancy

Previous obstetric record

- Nulliparous
- Multiparous (without a uterine scar)
- Multiparous (with a uterine scar)

Course of labour and delivery

- Spontaneous labour
- Induced labour
- Caesarean section before labour (emergency or elective)

Gestation

- The gestational age in completed weeks at the time of delivery

All these parameters are used to form a 10 group classification system of caesarean section by Robson MS

Robson MS in 2001 proposed the 10 group classification and studied using data from Wycombe Hospital, Buckinghamshire 1997. For the first time retrospectively he classified caesarean section in 10 groups amongst 2876 patients 468 underwent caesarean section and caesarean section rate was 16.3%. The group with most contribution of Patients was Group 3 it was around 37.4%. The Group 9 showed 100% caesarean section rate. The

contributions of Group 5, 6 and 7 was 62.4%, 92.6%, 81% respectively. Amongst 16.3% of caesarean section, 4.3% comprises of Group 5.

Robson MS did the study in 2001 "Can we reduce the caesarean section rate?" He studied total 2769 patient and caesarean section rate was 18.1% which increased over time. Maximum contribution of patients was made by Group 3. Again Group 9 showed 100% caesarean section rate. Group 5, 6, 7 showed 64%, 92.3% and 66.7% caesarean section rate respectively. Total 4.7% caesarean section in 18.1% belonged to Group 5. It was similar to previous study done by Robson MS².

Total 5745 patients admitted to Krishna institute of medical sciences, karad during the study period were studied and classified according to Robson's 10 group classification system. 2589 patients underwent caesarean section. An earnest attempt is made to correlate these results with other parallel studies in the literature.

Relative Size of Each Group

In our study total 5745 patients were included in study. After classifying according to Robsons 10 group system, Group 1 has the maximum contribution in all. Group 2 and Group 5 are second and third largest contributors in the study. Group 1, Group 2 and Group 5 have 26.09%, 21.56% and 17.26% contributions respectively (Table 1).

Bolognani CV, Reis LBdSM, Dias A, Calderon IdMP (2018) (26) did a study in two public hospital in Brazil showed Group 1 has the maximum contribution in all which is in Hospital A was 30% and in Hospital B was 26.2% which is comparable to our study. Group 5 had in hospital A and in Hospital B 18.9% and 19.6% contributions in total patients which is comparable to our study. Group 9 had the least contribution in both Hospital A and Hospital B which is similar in our study.⁸

Tanaka K and Mahomed K (2016) did a study in a Ipswich Hospital, Queensland, Australia, during the period January–December 2015 showed Group 3 had the maximum contribution in overall patient which was 34.4%. Group 1 was the group with second most largest contributor which was 18.6%. All these values are not comparable to our study.⁹

Rate of Caesarean Section in Each Group

In our study the Group 9 has the maximum caesarean section rate within group, it is 100% Group 5, Group 6 and Group 7 has the caesarean section rate within group respectively 85.78%,

83.63% and 85.33%. Group 3 has the least caesarean section rate.

Abdel-Aleem H *et al.* in 2013 did a study at Women's Health Hospital, Assiut University, in Assiut, Egypt by Comparing data in 2008 and 2011. Their results were similar to our study, Group 9 had the maximum contribution of caesarean section rate within group. Group 5 and Group 6 contributed 85% and 90% respectively in caesarean section rate within group which is comparable to our study.

Ray A and Jose S (2017) did a cross sectional study for a period of 24 months at a tertiary care hospital in a tribal area of Kerala South India. Women and found that Group 6 and Group 7 had the 100% caesarean section rate within group and Group 1 has the 6.94% caesarean section rate within group which is not comparable to our study.¹⁰

Relative Contribution to Overall Caesarean Section Rate

In our study we calculated the relative contribution to overall caesarean section rate by dividing number of caesarean section in each group by total number of caesarean section. In our study, maximum contributor group in overall caesarean section was Group 5. Group 5, Group 1, Group 2 contributed 32.86%, 18.77% and 25.10% respectively. Group 9 had the least contribution in overall caesarean section rate (Table 2).

Abdel-Aleem H *et al.* in 2013 did a study at Women's Health Hospital, Assiut University, in Assiut, Egypt and found that Group 5 was the maximum contributor group in overall caesarean section which is comparable to our study. Group 9 had the least contribution in overall caesarean section rate which is comparable to our study.

Pasko DN in 2018 did a study from research personnel abstracted maternal and neonatal records of >1,15,000 pregnant women from 25 hospitals (2008-11) in US and found that Group 5 was the maximum contributor group in overall caesarean section and Group 9 has the least contribution which is comparable to our study.¹¹

Contribution Made By Each Robson's Group in Overall Caesarean Section Rate

In our study overall caesarean section rate was 45.06%. we calculated contribution made by each group by dividing each group caesarean section by total number of patients delivered during study period. In our study maximum contribution of rate

was by Group 5 which was 14.81%. Group 2 was the second most contributor in caesarean section rate.

Bolognani CV, Reis LBdSM, Dias A, Calderon IdMP in 2018 did a study in two district hospital in Brazil and found that total caesarean section rate in Hospital A and Hospital B was 50.8% and 42.8% respectively which is comparable to our study. In both hospital maximum contribution of caesarean section rate was Group 5 and Group 2 was second most contributor which is comparable to our study.

Rossen J, Lucovnik M, Eggebø TM, *et al.* (2017) did a study in Stavanger University Hospital (SUH), Norway, National Maternity Hospital Dublin, Ireland and Slovenian National Perinatal Database (SLO), Slovenia and found that the caesarean section rate in these settings was respectively 13.6%, 21.4% and 17.4% which is not comparable to our study.¹²

Conclusion

Group 1 and Group 2 which consists of nulliparous patents with either spontaneous or induced labour is having more caesarean section rate. More focus should be on these groups to reduce primary caesarean section rate. Advancement in intrapartum foetal monitoring, small family norm and modern obstetrics will lead to increase in these caesarean section rate. By implementing the modalities like epidural analgesia, more knowledge and encouragement towards normal vaginal delivery during antenatal period will reduce these primary caesarean sections.

Group 5 which should be more focused. Group 5 is the product of Group 1 and Group 2. By reducing caesarean section in these groups we can reduce the size of Group 5. By motivating patients for the trial of labour after previous caesarean section can increase the rate of normal vaginal deliveries in this group.

Assurance and better obstetrics care can outways the risk of complications during trial of labour. By using epidural analgesia we can relieve the patients fear towards the labour pains.

Although this study didn't include caesarean sections on maternal request but we found that large number of caesarean sections were performed under this indication. Mostly Group 5 caesarean sections was under these indications. Mostly because of lack of knowledge about trial of labour and fear towards it, lead to repeat caesarean section. For many years it was thought that once a caesarean section always a caesarean section.

For patients with breech presentation, nowadays trial of labour is drastically reduced. Many institutions and private set up adopts in breech presentation safer way to deliver is by caesarean delivery. In future Rate of caesarean section in Group 6 and Group 7 will rise. Group 9 always be the group with 100% caesarean section rate in modern obstetrics.

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