

Assessing Indications of Caesarean Section among High Risk Pregnant Women by Robsons Classification: A Way of Monitoring Obstetric Practice

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Abstract

Background: There has been rapid increase in caesarean section (CS) rates in the past decade, leading to increased complications. World Health Organization (WHO) has recommended Robson ten group classification system which have been used in this study to analyse CS at Fakhruddin Ali Ahmed Medical College and Hospital (FAAMCH), Assam. The indications, rate of CS is scrutinised so that only obstetrically indicated CS are carried out.

Methods: This hospital based study was carried out for a period of 12 month from 1/1/2021 to 31/12/2021 at FAAMCH. All high risk cases ≥ 28 weeks who delivered during the said period were taken into account. The data was then regrouped according to Robson's Ten Group classification.

Results: The study reflected overall CS rate being 42.69% with CS rate amongst high risk pregnancies being 53.32%. Most of the women who underwent CS belonged to age group 20-24 years (49%). It was observed that group 1 (24.09%) constituted the largest number of women. However, group CS rate was highest in group 9 (100%). Group 5 made the greatest relative (32.38%) as well as absolute contribution (17.26%). Fetal compromise seems to be the leading cause for primary CS.

Conclusions: Robson classification helps in analysing the population catered by a centre to develop strategies for betterment of services. It has limitations in qualitative assessment of the data for comorbidities and severity of the disease.

Keywords: High Risk Pregnancy, Previous Caesarean Section, ROBSON Classification.

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Introduction

It is seen that over the last few decades, there has been a progressive increase in the rate of deliveries by caesarean section (CS)

in most of the countries but the drivers for this trend are not clearly understood. [1,2] Rising CS rate is a major public health

concern and it can cause world wide debates due to potential maternal and perinatal risks associated with this increase, inequity in access and cost factors. [3,4,5,6] In order to interpret and explain increasing CS rates, we need a classification system that can prospectively group all pregnant women. In 2011 a systemic review of 27 different classification systems was conducted by World Health Organization (WHO) which concluded that the 10-Groups classification in particular, [7,8] is in the best position to fulfill current international and local requirements. The

10-Groups classification (also named as the Robson Classification) was created to prospectively identify well-defined, clinically relevant group of women admitted for delivery and to investigate the differences in CS rates within these relatively homogeneous groups of women. [7] The classification system is very simple, clinically relevant, robust, accountable, replicable and verifiable and can help to identify where effective strategies like changing labour management protocols may help to optimize caesarean section rate. [8,9].

ROBSON CLASSIFICATION

Group 1 - Nulliparous, single cephalic, ≥ 37 weeks, in spontaneous labor
Group 2 - Nulliparous, single cephalic, ≥ 37 weeks, induced or CS before labor
2a- Nulliparous, singleton, cephalic, ≥ 37 weeks gestation, induced labor.
2b- Nulliparous, singleton, cephalic, ≥ 37 weeks gestation, caesarean section before labor.
Group 3 - Multiparous (excluding previous caesarean section), singleton, cephalic, ≥ 37 weeks gestation, in spontaneous labor.
Group 4 - Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, ≥ 37 weeks gestation, induced or caesarean section before labor.
4a- Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, ≥ 37 weeks gestation, induced labor.
4b- Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, ≥ 37 weeks gestation, caesarean section before labor.
Group 5 - Previous cesarean section, singleton, cephalic, ≥ 37 weeks gestation.
5.1 With one previous CS
5.2 With two or more previous CSs
Group 6 - All nulliparous with a single breech.
Group 7 - All multiparous with a single breech (including previous cesarean section).
Group 8 - All multiple pregnancies (including previous cesarean section).
Group 9 - All women with a single pregnancy in transverse or oblique lie (including those with previous caesarean section).
Group 10 - All singleton, cephalic, <37 weeks pregnancy (including post CS)

Objective

This study will help to understand the possible reasons of very high rate of caesarean section in current scenario and analyse the high risk cases turning into CS under Robson's classification for implementation in regular practice.

Methodology

This cross sectional study was done for deliveries in the Department of Obstetrics and Gynaecology of Fakhruddin Ali Ahmed Medical College and Hospital (FAAMCH), Barpeta, Assam amongst high risk pregnancies by Robson's ten group classification for 1 year (January to December, 2021). Purposive sampling was done, data was collected every 6th day in the

year of 2021. A total of 61 days of data collection was done and 527 high risk pregnancies with gestational age >28 weeks were identified in those 61 days. For this study, following high risk cases are collected and observed

- Extremes of age (35 years)
- Antepartum haemorrhage (APH)
- Malpresentations
- Hypertensive disorders of pregnancy (including PIH, pre-eclampsia, eclampsia)
- Severe anaemia (< 7 gm%)
- Elderly primi and grand multiparas
- Multifetal pregnancy
- H/O previous caesarean section
- Rh negative pregnancies
- Medical disorders (Thyroid disorders, diabetes etc.)
- Bad obstetric history, previous abortion and h/o infertility

All these 527 patients having any of the mentioned risk factors were evaluated and

an appropriate mode of termination was decided. All these subjects will be enrolled as per Robsons ten group classification system and the collected data will be compared with the standard criteria and further results evaluated.

Results and Observations

Total numbers of deliveries during the study period of 12 months from January 2021 to December 2021 in Fakhruddin Ali Ahmed Medical College and Hospital were 8560. Total numbers of CS were 3655 and the total numbers of vaginal deliveries were 4905. The overall CS rate for the year 2021 was 42.69%. Out of 8560 deliveries, 3712 high risk cases were identified. Overall high risk pregnancy percentage being 43.36%. According to the sample collection plan, 527 cases of high risk pregnancy data was collected, their progress seen and outcome documented, out of which 281 deliveries (53.32%) were by caesarean section and rest through vaginal route.

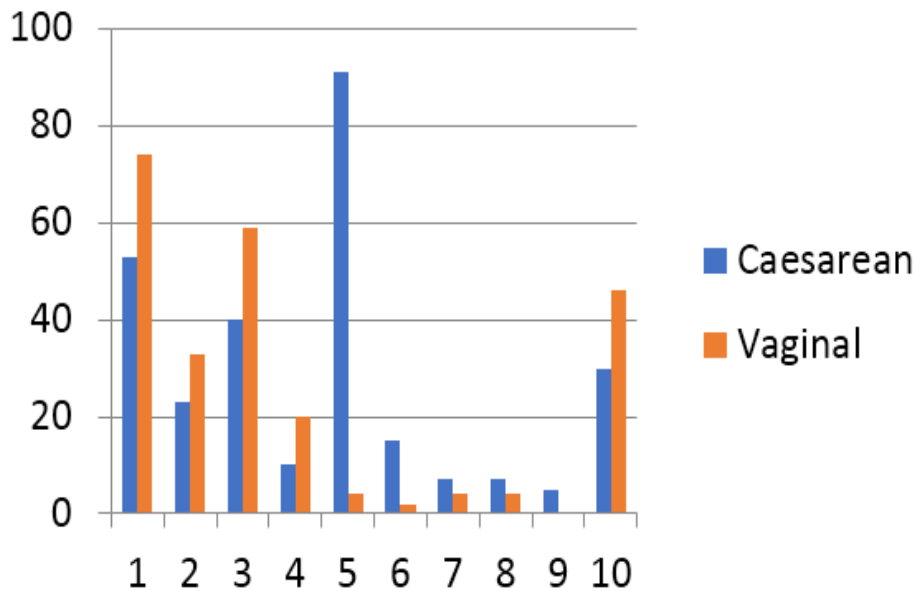


Figure 1: Chart showing mode of delivery in each group

Table 1: Classification of caesarean section according to Robson ten group classification system

Groups	No. of CS over total no. of women in the group	Relative size of the group (%) (Total no. of women in group over 527)	CS rate in each group (%)	Absolute contribution made by each group to overall cs rate (no. of CS/ no. of women delivered %)	Relative contribution made by each group to the overall CS rate (no. of CS/ total no. of CS done %)
1	53/127	24.09	41.73	10.06	18.86
2	23/56	10.52	41.07	4.36	8.18
3	40/99	18.78	40.4	7.59	14.23
4	10/30	5.69	33.33	1.89	3.56
5	91/95	18.03	95.78	17.26	32.38
6	15/17	3.22	88.23	2.84	5.33
7	7/11	2.08	63.63	1.33	2.49
8	7/11	2.08	63.63	1.33	2.49
9	5/5	0.94	100	0.94	1.78
10	30/76	14.42	39.42	5.69	10.67

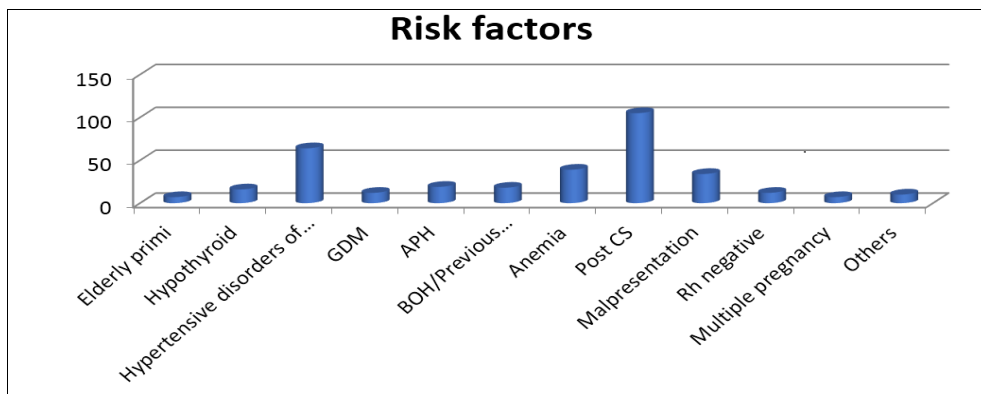


Figure 2: Different high risk pregnancies encountered in FAAMCH

The most commonly encountered risk factor was pregnancy with previous CS, followed by hypertensive disorder of pregnancy, malpresentations, bad obstetric history, antepartum haemorrhage, hypothyroidism. On evaluating the

indications of CS in these groups, 44.48% patients had primary CS with compromised fetus as their commonest indication. 55.55% patients had secondary CS with previous CS being the commonest indication.

Table 2: Indications of CS encountered

Indications of CS	No. of patients (total= 281)	Percentage
Secondary CS (including multiple pregnancy, malpresentation, preterm CS)	156	55.55%
Primary CS	125	44.48%
Compromised Fetus (fetal distress, intrauterine growth retardation, abnormal cardiotocography/ doppler, fetal bradycardia etc.)	59	20.99%

CPD/obstructed labour/ nonprogress of labour/ DTA	20	7.12%
Induction failure	5	1.78%
Precious pregnancy/ bad obstetric history	14	4.98%
Malpresentation (breech, transverse lie) (excludes multiparous pregnancy with previous CS)	6	2.13%
APH	4	1.42%
Others	17	6.04%

Table 3: Steps to assess type of population by the size of group¹⁰

Steps to assess type of population by the size of group	Recommended	This study	Interpretation
Group 1 + Group 2	35-42%	34.61%	The center is dealing with adequate number of nulliparous
Group 3 + 4	30%	24.47%	A reason for this low size is high size of group 5 and Nulliparous high-risk pregnancy was found commoner to multiparous high-risk pregnancy.
Group 5	<10%	18.03%	there has been a high CS rate in the past years in this hospital and mainly in Groups 1 and 2.
Group 6 + 7	3-4%	5.30%	the commonest reason of this is a high rate of preterm deliveries or a high proportion of nulliparous women.
Group 8	1.5 -2%	2.07%	hospital is a tertiary referral centre
Group 10	<5%	14.42%	The above hypothesis in group 6 + group 7 is proved by the Size of Group 10, which is 14.42%, much higher than the WHO recommended
Ratio of Group 1 versus Group 2	$\geq 2/1$	2.29/1	reliability of data collection
Ratio of Group 3 versus Group 4	$> 2/1$	3.30/1	reliability of data collection
Ratio of Group 6 versus Group 7	2	1.56/1	breeches are more frequent in nulliparous women than in multiparous women

Table 4: Steps to assess caesarean section rates using the Robson Report Table¹⁰

Steps to assess caesarean section rates (CSR)	Robson guideline	Value achieved in this study	Further Interpretation
CSR Group 1	<10% is achievable	41.73%	CSR is much higher may be because FAAMCH is a tertiary unit with majority referred cases and high-risk pregnancies.
CSR Group 2	20-35%	41.07%	Again because FAAMCH is a tertiary unit with majority referred cases and high risk pregnancies
CSR Group 4	>15%	33.33%	May be due to poor success rates for induction or poor choice of women for induction

CSR Group 5	50-60%	95.78%	The higher rate achieved is possibly due to women with 2 or more previous CS. Also, scheduling pre-labour CS for women with 1 previous scar without attempting a trial of labour in high-risk cases may be a cause.
CSR Group 8	60%.	63.63%	Type of twin pregnancy and the ratio of nulliparous/multiparous with or without a previous scar may lead to the variations.
CSR Group 10	30%	39.47%	Rate higher than 30% denotes too many cases of high-risk pregnancies (e.g. fetal growth restriction, preeclampsia) that needed preterm pre-labour CS.
Relative contribution of Groups 1, 2 and 5 to the overall CS rate	2/3 (66%) of all CS	59.42%	If the hospital is trying to lower its overall CS rate, these three groups need attention. The higher the overall CS rate, greater the focus should be in Group 1.
Absolute contribution of Group 5 to the overall CS		17.26%	The absolute contribution of Group 5 is the highest in comparison to other groups.

Discussion

CSR amongst high risk pregnancies is calculated to be 53.32% in this study, which is higher than WHO (1985) standards. The WHO standards taken is of general population while our study population is that of the high risk pregnancies in a tertiary care centre. Also it is important that the outcome of the pregnancy should be fruitful one rather than a strive to achieve specific caesarean section rate. Also demographic variation, variation in population composition and uneven distribution of high risk cases restricts standardization of CSR in a tertiary centre which caters to around 8 districts and char areas. The CS rate was 54.43% amongst high risk pregnancies at Madhya Pradesh in a study done by Patel et al. [11] The rates were respectively 32.6% and 49.68% in two separate studies carried out in Puducherry and Telangana. [12,13] 39.50% were nullipara and 89.33% had gestational age ≥ 37 weeks in this study. 47.1% were nullipara and 80.5% presented ≥ 37 weeks in a study in Ethiopia, while a study in Bareilly found that 45.4% were nullipara

and 81.6% presented ≥ 37 weeks. [14,15] The overall largest groups of patients presenting for delivery at FAAMCH were represented by groups 1 (24.09%), 3 (18.78%) and 5 (18.03%) respectively. Similar results were found in Ethiopia and India where group 1 (26.7% and 24.2% respectively) had the largest representation followed by 3 (22.2% and 19.2% respectively). [14,16] A study in Brazil found that group 3 was the largest contributor followed by group 1 and 5. [17] The group CS rate in our study is largest in group 9 (100%) followed by group 5 (95.78%). It is also significant in groups 6 (88.23%), 7(63.63%) and 8 (63.63%). The study in Puducherry found CS rates of 100% in groups 6, 7 and 9 and a CS rate of 89.6% in group 5. [12] The group CS rate was also found to be 100% in group 9 in study in Ethiopia, but their second highest contributor to group CS rate was group 2. [14] A study in Oman also showed group CS rate of 100% in group 9, with only 58.2% in group 5. [10] Group CS rate was highest in group 9, as the prospect of spontaneous delivery in abnormal lies is very grim. The high CS rate in group 5 (Previous CS group) is chiefly because of

less number of vaginal births after CS (VBAC) due to fear of rupture uterus and other unforeseen complications. Only those patients who presented in active labour were taken up for VBAC. The higher CS rate in group 6 (nulliparous breech) is due to less rate of external cephalic version at our hospital and fear of complications related to after coming head of breech. Group 10 represented 14.42% of obstetric population and CS rate of 39.42%. According to Robson, size of Group 10 should be <5% and CS rate in most population is usually around 30%. [17] Tahira Kazmi et al represented a smaller group size (1.8%) and high CS rate of 80.8% in Group 10. [15] A large group size reported in this study suggests that FAAMCH is dealing with an obstetric population at high risk for preterm labour.

The major contributors to the overall caesarean section rate are Nulliparous woman with single cephalic term pregnancy and previous LSCS (groups 1, 2 and 5). Group 5 is the largest contributor of both relative (32.38%) and absolute (17.26%) caesarean rate. Similar findings have been reported, where group 5 made the largest representation, by studies carried out in Oman where absolute rate of group 5 was 6.79% as well as in various parts of India such as Puducherry, Telangana, Bareilly and Pune with relative contribution rate of group 5 at 40.1%, 48.9%, 34.59% and 34.9% respectively. [12,13,15,16,18] On analysis of indication of CS, we found that repeat CS is the most common indication. Major indication in nulliparous women was found to be fetal distress followed by cephalopelvic disproportion and non-progression of labour, precious pregnancy, deep transverse arrest. The probability of less fetal injury and better fetal outcome in precious pregnancy makes the decision of termination in favour of LSCS mode of delivery. Studies in Bareilly, Bangladesh and China also exhibited that compromised fetus is the most common indication of primary CS. [16,19,20] CS,

when carried out, without any proper indication, may prove to be a faulty obstetric practice and may intensify the risk of maternal morbidity and mortality, not only in the ongoing pregnancy but also in future ones, particularly in low resource countries. [21]

The main target for reducing the rate should be group 5, since it has the highest depiction of caesarean rate. Counselling and exercising vaginal delivery after caesarean birth though careful monitoring and supervision should be advocated. Also, CSs due to maternal request in such cases should be curtailed. [21] For reducing the rate of repeat CS, primary CS need to be decreased as well. This can be achieved by preventing over-diagnosis of fetal compromise, reserving induction of labour only for clearly indicated cases, carrying out instrumental deliveries in suitable scenario, performing external cephalic version in malpresentation, adequate counselling and encouraging for Trial of labour after caesarean section, cautious and careful management of dystocia and non-reassuring fetal status etc. [22]

Conclusion

The Robson categories are mutually exclusive, totally inclusive, and can be used for prospective application, so that each woman planned for delivery can fall categorically in a particular group for a standardized comparison. This would help in devising and implementing institute wise proper guidelines for carrying out CS in a judicious way. However, our study is not without limitations as it is a hospital based study carried out over a limited period of 1 year in a tertiary care referral hospital, where the rate of CS seems to be elevated in general. Hence, to extract more detailed information, a multi centred broader study covering a larger number of patients over a longer time period is required. Also, we have considered CS in patients with gestational age ≥ 28 weeks only, hence the findings of our study may not conform with those of other countries, where the age of

viability is 24 weeks. Since the maximum contribution to increased CS rate has been made by the previous CS group, the rate of primary CS should be reduced and more vaginal birth after CS should be encouraged. Robson classification is an internationally accepted classification which should be adopted to mitigate increasing caesarean rates and CS should be offered to only medically and obstetrically indicated women. It is easily implementable and effective tool for ongoing surveillance. Comparison of results can be done in between institutions, states and countries. All medical institutes can use the Robson's classification system as part of a quality improvement initiative to monitor caesarean section rates.

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