

Original Articles

Analysis of Caesarian Section Rates Using Robson's Ten Group Classification in a Tertiary Care Hospital

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Abstract:

Background: Robson, proposed a new classification system, the Robson's Ten Group Classification to allow critical analysis of assessing Caesarean section rate according to characteristics of pregnancy. Auditing Caesarian section rates can be done using Robson's classification which in turns helps achieving a uniform basis for comparison across centers and across various countries. The objective was to describe caesarean rates in a tertiary care hospital of Dhaka using Robson's Ten Groups Classification.

Methods: A retrospective study was done in Dhaka Community Medical College & Hospital, Dhaka, over a period of one year January 2018 to December 2018. All cases of LUCS done during this period were classified according to Robson's classification and analyzed.

Results: A total number of 757 deliveries were conducted over this one year study period. C-Section was performed in 550 patients, giving C-section rates of 73%. Robson's group 5 was the highest contributors to overall CS rate, contributing 28% of all C-sections, followed by group 2 and 4 combinedly contributes 20% of overall CS rate (13.4% and 13.1% respectively). The most common indications of primary C-section were failure to progress of labour (12.5%), Fetal distress (12.4%), and CPD (10.7%).

Conclusions: Robson's classification helps to identify and analyze the groups that contribute to the most to overall caesarian section rate. This may help to modify strategies and interventions to optimize caesarian section rate.

Keywords: Caesarean section rate, Robson's Ten Groups Classification System.

Introduction:

Rising caesarean section (CS) rate is of worldwide concern¹. Over the last few decades, the global caesarean section rate has significantly increased². World Health Organization advised that Caesarian section rate should not be more than 15% with some evidence that CS rates above 15% are not associated with additional reduction in maternal and neonatal mortality and morbidity³.

There has been a steady increase in the rate of CS in both developed and developing countries although there exist a wide variation in caesarian rates between the two⁴. Lower uterine caesarian section (LUCS) rates have increased globally 5-7% in 1970 to 25-30% in 2003⁵. In U.K, it rose from 9% in 1980 to 21.3% in 2000⁴. In Brazil, rising of LSCS rate from 50% to 72% has been reported⁶. In one study of India stated the rate was 25.1%⁷ and the overall rate of

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CS in mainland China was 54.90%⁸. LSCS rate in U.S and Latin American countries are 29.1% and 40% respectively^{9, 10}. The rate has increased from 23.3% in 2000 to 33% in 2013 in Australia¹¹.

In Bangladesh, the rate of Caesarean Section (CS) has increased dramatically within the last decade. The percentage of births delivered by CS has increased from 4% in 2004 to 9% in 2007, 17% in 2011 and 23% in 2014¹².

Analysis of CS rates in different countries, including primary vs. repeat CS and potential reasons of these, provide important insights into the solution for reducing the overall CS rate¹³. In order to understand what is the driving force for this trend, a tool to monitor and compare the caesarean section rates in a same setting over time and among different settings is needed¹⁴. In 2015 WHO proposed the use of the Robson classifications a global standard for assessing, monitoring and comparing caesarean section rates of different health care facilities. Women who gave birth are categorized into ten groups based on their basic obstetric characteristics of parity, previous CS, gestational age, mode of onset of labor, fetal presentations and number of fetus. The Ten-Group Robson Classification has been endorsed for its simplicity, robustness, reproducibility and flexibility and has been recommended for monitoring rates over times as well as between facilities by both WHO in 2014 and FIGO in 2016^{15, 16}.

The rising rate of CS is a complex issue. It can be primarily attributed to increasing maternal age, increased number of multiple pregnancies, and high rate of obesity among women. Other factors leading to rising CS rates include development of better anesthetics agents and technique, availability of tertiary care neonatal facilities, better operative techniques, availability of antibiotics, belief that CS is less traumatic to the baby and prevents trauma & damage to the pelvic floor, fear of birth and labor pain, fear of medical litigation and convenience of care provider and mother¹⁷.

The aim of the study was to investigate CS rates and its indications at a tertiary centre with limited resources and make analysis based on the Robson's Ten Group Classification (RTGC)

Methods:

This retrospective study was done in Dhaka community medical college & hospital from January 2018 to December 2018.

Inclusion criteria

All patient delivered by LUCS during the study period and indications of C-section were classified according to Robson's classification system.

Each group relevant data on name, age, IP number, obstetric history, socioeconomic status, stage of labour, previous obstetric history, single or multiple, term or preterm pregnancy and LUCS were noted from hospital record.

Exclusion criteria

Term normal or instrumental delivery

Preterm normal or instrumental delivery.

Collected data were analyzed using simple statistical measures and expressed in percentage.

Results:

The total number of women delivered during the study period was 757, out of which CS delivery were 550 leading to a rate of 73% whereas rate of vaginal delivery was 23% (Fig. 1)

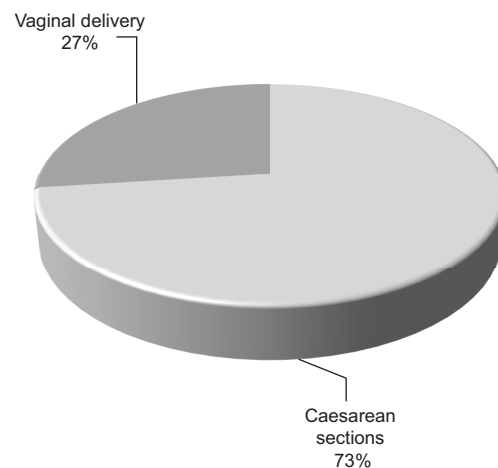


Fig.-1: Distribution of mode of deliveries

Women who delivered by CS were analyzed using Robson's classification. Table 1 shows the CS rate in each of these 10 groups as well as the contribution of each group to the overall CS rate. Analysis based on Robson's ten group showed that Group 5 (previous CS, single cephalic, >37 weeks) made the greatest contribution to the total CS rate. Group 2 (nulliparous, single cephalic, >37 weeks, induced or CS before labour) and Group 4 (multiparous, single cephalic, >37 weeks, induced or Cs before labour),

Table-I
Rate of caesarean section by the Ten-Group Robson classification

No	Robson's Groups	Relative size of group (% of total no of births	C/S rate in each group (% of women in each group)	Contribution made by each group to the overall CS rate %
1	Nulliparous, Single, Cephalic, >37 weeks in spontaneous labour	11.5 %	31/87 (35.6 %)	4.1 %
2	Nulliparous, Single, Cephalic, >37 weeks ,Induced or C/S before labour	15.7 %	101/119 (84.4%)	13.4 %
3	Multiparous (excluding previous CS), Single, Cephalic, >37 weeks in spontaneous labour	18.6 %	51/141 (36%)	6.7 %
4	Multiparous (excluding previous CS), Single, Cephalic, >37 weeks ,Induced or C/S before labour	16.5 %	99/125 (79%)	13.1 %
5	Previous CS, Single cephalic, >37 weeks	28.1 %	211/213 (99.1 %)	28 %
6	All nulliparous breeches	0.9 %	07/07 (100%)	0.9 %
7	All multiparous breeches (including previous CS)	0.8 %	06/06 (100%)	0.8 %
8	All multiple pregnancies (including previous CS)	1.6 %	10/12 (83.3 %)	1.3 %
9	All abnormal lies (including previous CS)	0.1 %	01/01 (100%)	0.1 %
10	All single cephalic, <36 weeks (including previous CS)	6.0 %	33/46 (71.7 %)	4.4 %
Total		100 %	550/757	73 %

combined had the second highest contribution to the CS rate and Group 3 (multiparous, single cephalic, >37 weeks in spontaneous labour) placed third.

Greatest contributors to overall CS rate were Group 5 (previous CS, single cephalic, >37 weeks) 28%. Although overall rate of CS was 73%. CS in this group was 99% (211 out of 213 women). There were two VBAC.

The second largest contributor was Group 2 (nulliparous, single cephalic, >37 weeks, induced or CS before labour) and group 4 (multiparous, single cephalic, >37 weeks, induced or CS before labour) combined. These two groups contribute 26.5% of the overall CS rate and relative sizes of groups were 32.2% combinedly. Indications of CS were due to cephalo-pelvic disproportion (24.5%), fetal hypoxia (19.5%) and failure to progress or induction failure (15.5%) in these two groups.

The third contribution was from group 3 (multiparous, single cephalic, >37 weeks in spontaneous labour) relative group size of 18.6% and overall CS rate 6.7%. Among the indications 39% CS occur due to failure to progress of labour.

Hence, these four groups (5, 2, 4 and 3) contribute to more than 61% of all Caesarean sections carried out during the study period. Group 1 (nulliparous, single, cephalic, >37 weeks in spontaneous labour) and group 10 (single cephalic , <36 weeks) contribute to 4.1% & 4.4% of CS respectively while breech presentation , twin pregnancies and abnormal lie 3.1% of all CS.

As depicted in figure 2, it has been observed that women at term with previous CS group 5 were the most significant one who contributed 38% of 550 caesarean section during the study period at DCMCH. Therefore, group 2 (nulliparous, single cephalic, >37 weeks, induced or CS before labour) and group 4 (multiparous, single cephalic, >37 weeks, induced or CS before labour) were the second highest that contributed 36% combinedly. Nevertheless, group 3, 1 and 10 contributed 9%, 6% & 6% respectively among all the CS.

As shown in figure 3, the main indication for performing CS were previous CS, fetal distress, failure to progress labour, CPD and medical disorders of women.

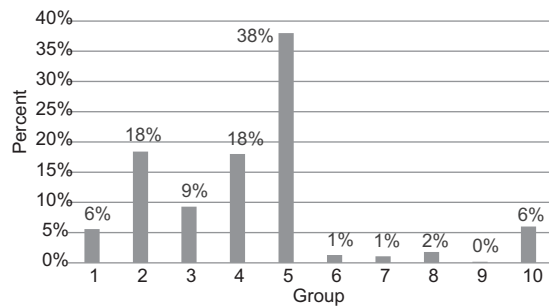


Fig.-2: Distribution of Robson Group of caesarian section in Dhaka Community Medical College & Hospital, 2018.

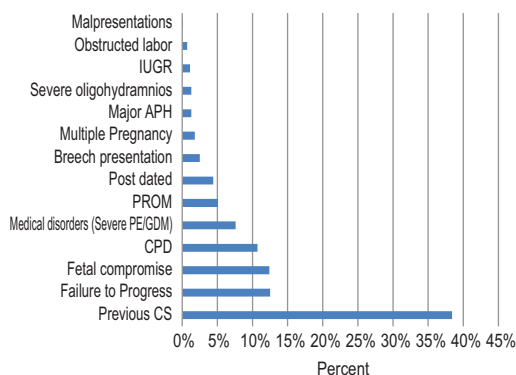


Fig.-3: Indications for CS in Dhaka Community Medical College & Hospital, 2018.

Discussion:

Most Caesarean sections are classified according to the clinical reason for the surgery¹⁸. It is then difficult to compare CS rates with others because the same terms are not usually used. In 2001 Dr Michael Robson, of the national maternity hospital, Dublin, proposed the new Ten Group classification System (TGCS). These 10 groups are mutually exclusive, simple to use and read yet include the total sample¹⁹.

The TGCS is in use worldwide and WHO applied the Robson 10 Group Classifications to a multi country dataset. The Robson 10 Group Classification System facilitates comparative analyses of Caesarian sections between hospitals or centers nationally, internationally and globally¹⁴.

In Bangladesh, the national CS rate is 23%¹². We noticed a wide discrepancy between public and private centers, urban and rural area and also differ by education and health quality of mother.

Each group on the TGCS accounts for a particular type of population. Groups were interpreted according to Robson’s Classification. All groups were analyzed clinically according to TGCS.

We present our data to encourage other obstetrics unit to adopt this classification that is simple to incorporate into the routine perinatal data collection system. CS rate for each of the 10 groups can then become more meaningful and rates for each group can then be compared with other obstetric units. Secondly by identifying groups that contribute most to the CS rate in our unit, as we believe they would be similar to the other units as well, quality improvement activity could be initiated to modify the CS rate in a particular group.

Group 5 (previous CS, singleton cephalic, e” 37 weeks) was the largest contributor to the overall CS rate (28 %) of the total 73% mostly due to women having CS prior to labour. Similar to Tanaka K et al where the group 5 was the largest contributor to the overall CS rate (10.9% of the total 23.5%) mostly due to women having CS prior to labour²⁰. In Shankar p et al Group 5 contributed highest number of C section of their study which was 36.4%¹⁴. As vogel et al noticed it in a WHO survey; women who have previously had a caesarian section are an increase important determinant of overall caesarian rates in countries with a moderate and low Human Development Index¹.

Present group 2 and 4 together contribute 26.5% (13.4% and 13.1% respectively) of the total CS rate. In Kotreshwara S et al the group 2 contributed to around 32.2% which was the leading group in their study²¹. In our study Group 3 contributed to around 6.7% of overall CS rate. In Kotreshwarw S et al Group 3 contributed to 4th largest group (2.28% of the total 36.88%) in overall CS rate of their study²⁰.

Regarding the performance of CS among low risk groups (groups 1, 2, 3 and 4) are for non-absolute medical indications- fetal compromise (12.4%), failure to progress or induction failure (12.5%) and for absolute indication CPD (10.7%). The possible reasons for the increase in CS among these groups should be explored to decrease overall CS rate and is repeat caesarean in the future (group 5). In our centre the way to detect fetal hypoxia are clinically , by CTG , Close monitoring of patients with adequate recording of fetal heart rate on partograph and amniotic fluid inspection after rupture of membrane, which may lead to over diagnosis of fetal hypoxia. On the other hand, choosing right cases for induction of labour is required. The areas for reanalysis for failed induction would be requiring appropriate method of induction, drugs used in appropriate dose, strictly reassessing, choosing right cases for induction of labour and quality of drugs. Strategies to reduce

the frequency of primary caesarian section should be planned. Improved case selection for induction, vigilant monitoring and more scrutiny of pre-labour C-section could also reduce caesarian sections rate.

Conclusion:

The Ten Group Robson Classification helps in analysis as well as putting in perspective the number of CS done and group which contributes maximum. This classification helps us to focus on certain groups to reduce CS rate. It also helps us to reanalyze our protocols for reducing CS rate.

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