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Analysis of Caesarean Sections Using Robson Classification in Teaching Hospital Batticalao, Sri Lanka

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

It was a retrospective cross section study conducted for a period of 6 months from January 2019 at Teaching Hospital Batticaloa, Sri Lanka to identify the main groups contributing to a high caesarian section rates using the Robson's classification. All the caesarian sections were included during the study period and the total numbers of deliveries were 2968, out of which 720 were caesarean deliveries, giving an overall caesarean section rate of 25.13%. The previous results contribute 30 % of the CS. Therefore, increasing Vaginal Birth after Cesarean Section (VBAC) can greatly reduce the CS rates. Further, 52% of CS was done primarily. It is also an important target population of major concern in order to reduce the overall CS rates in this institution.

Keywords: Caesarean section; robson ten-group classification system; observational study.

1. INTRODUCTION

Since 1985, the international healthcare community has considered the ideal rate for caesarean sections to be between 10% and 15% [1]. In recent years, governments and clinicians have expressed concern about the rise in the numbers of caesarean section births and the

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potential negative consequences for maternal and infant health [1] and no additional reduction in maternal and neonatal mortality and morbidity has been documented when the rate exceeds this percentage [2].

Analyzing CS rates in different countries provides an important insight into the solution for reducing the overall CS rate. The rate of increase is highest in low income countries [3].

However, it is difficult to determine the optimal rates of caesarean section. Setting up of optimal rates needs to consider the possibility of unmet need for caesarean sections as well. Caesarean section rates should no longer be thought too high or too low but rather whether they are appropriate or not, after taking into consideration all relevant information [4]. To capture all relevant information a classification criterion with various modifications have been put forward and been used in many centers worldwide.

Robson's ten group classification of caesarian section (RTGCS) is a global standard used to allow critical analysis according to characteristics of pregnancy nationally and internationally [5] (Table 1). This system uses ten mutually exclusive and totally inclusive categories for caesarean section i.e. all women can only be classified into only one group.

Robson's classification depends on women's gestation age, onset of labour, fetal presentation and number of fetuses without needing the indication of induction. It can be easily classified and it can provide the critical assessment of care at delivery. Information obtained by Robson's classification helps delivery units for the better care of women. Audit of caesarian sections using the RTGCS per se cannot explain the reasons for high caesarian section rates. A more detailed secondary analysis, of the underlying circumstances and indications for caesarian section, is needed to identify possible remedial measures which can reduce the high caesarian section rates [6,7]. The aim of this cross-sectional retrospective study was to apply the original RTGCS to caesarean sections in Teaching Hospital, Batticaloa, in order to determine the rates in the different groups and the contribution of each group to the over rate. Further, the finding of the study would help to identify and evaluate the main contributors to the increasing CS rate.

2. METHODS

This study was done in Teaching Hospital, Batticaloa which is the main tertiary referral centre in Eastern province of Sri Lanka, conducting approximately 9000-10,000 deliveries annually.

All the caesarian sections were conducted for a period of 6 months from January to June 2019 in the all three obstetric units at Teaching Hospital Batticaloa. A total number of 720 caesarean deliveries were analyzed from the data on the maternal case sheets (Bed head ticket), operation registers and new born records. Preterm deliveries were excluded from the study. Maternal data collected included the age, parity, elective or emergency caesarean section and its indications. The neonatal data included birth weight, Apgar score, NICU admissions and neonatal outcomes.

The various categories of indications for caesarean sections included fetal distress, abnormal lie, intrauterine growth restriction, severe oligohydramnios, antepartum haemorrhage, previous adverse neonatal outcome, cord prolapse, deep transverse arrest, poor progress of labour, eclampsia, diabetes

Table 1. Robson' 10-group classification

Number	Group
1.	Nulliparous, single cephalic, >37 weeks in spontaneous labor
2.	Nulliparous, single cephalic, >37 weeks, induced or CS before labor
3.	Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous
4	Multiparous (excluding previous CS), single cephalic, >37 weeks, induced
5	Previous CS, single cephalic, >37 weeks
6.	All nulliparous breeches
7	All multiparous breeches (including previous CS)
8.	All multiple pregnancies (including previous CS)
9.	All abnormal lies (including previous CS)
10.	All single cephalic, <36 weeks (including previous CS)

Table 2. Contribution of each group for overall C/S rate

Rank	ROBSON classification Score	Frequency	Contribution of each group overall C/S rate (A/total number of LSCS *100)	Contribution of each group overall C/S rate (A/total number of deliveries *100)
1	5	224	30.03	7.55%
2	2	166	22.25	5.59%
3	4	118	15.82	3.98%
4	1	76	10.19	2.56%
5	3	34	4.56	1.15%
6	6	34	4.56	1.15%
7	10	34	4.56	1.15%
8	7	14	1.88	0.47%
9	8	12	1.61	0.4%
10	9	8	1.07	0.27%

mellitus, heart disease complicating pregnancy, large fetus, multiple pregnancy, previous caesarean section, placenta praevia, thick or moderately thick meconium stained liquor, obstructed labour, failed induction, previous uterine surgery like myomectomy and advanced age. These indications were often difficult to define, which leads to inconsistency in their use. Undoubtedly, there were some overlap, but the indications were grouped according to the most significant one.

All deliveries were classified in accordance with the RTGCS using maternal characteristics and obstetrical history and for each of the ten groups the CS rate, the relative size and the contribution to the total CS rate were calculated. This classification made it possible to distinguish the deliveries in terms of parity, single or multiple pregnancy, presenting part of the fetus, gestational age, course of labour and the presence of a previous CS.

For each group, the mean and calculated its relative size and its contribution to the overall caesarean rate were analyzed. Proportions were calculated for categorical data. The IBM Statistical Package for Social Sciences (SPSS) version 24 was used for the analysis

3. RESULTS

The total number of deliveries over the period of 6 months from January to June 2019 were 2968, out of which 720 were caesarean deliveries, giving an overall caesarean section rate of 25.13%. On analysis of CS according to Robson's classification, different rate of each group was shown separately (Table 2).

Group 5 (previous CS group) made the greatest contribution to the total CS rate. The other groups contributing to the overall caesarean section rate in descending order is as follows: Group 2 (nulliparous, single cephalic, >37 weeks, induced or CS before labour), group 4 (multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labour),)), group 1 (Nulliparous, single cephalic, >37 weeks in spontaneous labour), group 3 (Multiparous (excluding previous CS), single cephalic, >37 weeks in spontaneous labour), group 6 (All nulliparous breeches), group 10 (all single cephalic, <36 weeks (including previous CS)), group 7 (All multiparous breeches (including previous CS), group 8 (All multiple pregnancies (including previous CS)) and group 9 (All abnormal lies (including previous CS)).

The elective caesarean section and emergency caesarean section respectively contributed 54.7% and 45.3% of the total caesarean sections (Table 3).

Table 3. Percentage of emergency versus elective LSCS

Mode of Delivery	Frequency	%
EL/LSCS	394	54.7
EM/LSCS	326	45.3
Total	720	100.0

Table 4. Distribution of patients who underwent LSCS by age

Age Category (years)	Frequency	%
Normal (17-35)	500	69.4
Teenage (< 16)	76	10.6
Elderly (> 35)	144	20.0
Total	**720**	**100.0**

4. DISCUSSION

The Robson's TGCS is used worldwide and simple to use. WHO has applied the Robson 10 group classifications to a multi-country dataset [8]. The Robson 10 group classification system facilitates comparative analyses of caesarean sections between hospitals/centres nationally, internationally and globally [9].

For the last 30 years, there has been a public concern about increasing CS rates [10]. The increase has been a global phenomenon, the timing and rate of the increase has differed from one country to another.

The CS rate reported in Australia ranges from 28% to 33.1% [11,12]. This CS rate is similar to Asian countries (27.3%), [13] but lower than that reported in the USA (31.1%) [14]. While this study gave the rate of 25.13%, which is quite low compared to other reports but still above the WHO criteria. In comparison with other international studies, the current study results were quite reassuring. From the Robson classification the contribution to the overall caesarean section rate in descending order is as follows; 5,2,4,1,3,6,10,7,8 and 9. It is clear that groups 5, 2 and 4 contribute about 67% of the total caesarean sections rates. On the other hand, in a study by Samba A, groups 2, 4 and 5 contributed nearly half (47.5%) of the overall caesarean section rate [15].

This reveals the significance of the Robson criteria, where different institutions would have to develop different strategies to address the caesarean section rates. As shown in this study, the main contributing groups to the overall CS rate were the Previous CS (Group 5). It contributes 30% of the caesarean section and it contributes7.55% of the overall deliveries. This value is lesser than many other similar studies. For instance, it was 11.2% in a study by Samba [15]. The reason for the differences can be explained as following. The present study was done three units of Teaching Hospital, Batticaloa and the CS rate is different in each unit. It varies 19%-46 %.Therefore, it influences on overall percentage of the CS rate.

VBAC (vaginal birth after caesarean section) can decrease group 5s contribution to caesarean section rates. The risk-taking attitude of the care providing obstetrician and pregnant women can greatly influence this. The staff needs to be trained to provide quality intrapartum care and for early detection of the possibility of the scar rupture in order to achieve high success rate in VBAC.

This study showed that Primigravida group, (Group 2), i.e, giving the contribution rate of 22%, which is similar to other studies [9,16].

The contribution of primary CS rate to the overall CS rate by single cephalic term pregnancies (Groups 1, 2, 3 and 4) was 52% in this study, which is slightly higher than the others, where primary CS rate was approaching 50% [17].

It can be learned that measures to decrease the primary caesarean section rates is the main strategy to reduce overall caesarean section rates. A correct diagnosis of labour, avoiding any medical intervention such as amniotomy and oxytocin infusion to accelerate the labour for uncomplicated pregnancies in latent phase of the labour and good quality of intrapartum care are some of the important strategies to increase the number of successful vaginal births. In addition, attempts should be made to perform most caesarean sections for valid obstetric reasons.

Another interesting finding is that Group 4 (Multiparous (excluding previous CS), single cephalic, >37 weeks, induced) alone contributed 15% of CS. The chance for the successful vaginal delivery is more in a woman who had previously vaginal delivery. Therefore, absolute indication for the induction of labour must be carefully made in order to reduce the caesarean section in this group.

Group 5 is the greatest contribution to the CS (Previous CS, single cephalic, >37 weeks). It contributes 30 % of the overall CS.

The group 9 has the least contribution; only about 1 % of the total CS rate. This is because abnormal lie contributes 1% of the total pregnancies. Therefore, its contribution to overall CS would be low [18].

5. CONCLUSION

The general characteristics and the pattern of the women having CS have been identified. Even though the overall CS rate in the study is not high as compared to international studies, contribution of repeat CS is 30% of the overall CS rate. It is also important that efforts to reduce the overall CS rate should focus on reducing the primary CS rate. More analytical studies based on Robson's

10-group classification are needed locally, to evaluate the indications of CS within each group.

An assessment should be done for the feasibility of increasing VBACS. The indications and the factors responsible for the high CS rates prior to the onset of labour (i.e. primary caesarean sections) needs to be critically appraised with a view to reducing if possible, the CS rates in this group of women.

The factors leading to CS after spontaneous labour needs to be critically appraised to assess the feasibility of reducing CS in this group of women. The factors which lead to CS in multipara at term with a singleton vertex presentation also needs to be analyzed. It appears to be justified and feasible to attempt reducing the rising CS rates at the Teaching Hospital Batticaloa.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, patient's consent has been collected and preserved by the authors.

ETHICAL APPROVAL

Ethical approval had been obtained from the ethical review committee of Faculty of Health Care Sciences (FHCS), Eastern university, Sri Lanka and administrative approval was obtained from the director of Teaching Hospital, Batticaloa and the consultant of each ward.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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