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Original Research Article

Assessing caesarean section trends in tertiary care using Robson's ten group classification

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ABSTRACT

Background: This study determined which clinical situations contributed to and led to caesarean delivery in tertiary care hospitals, using Robson's classification approach, and to audit the rising prevalence of caesarean sections.
Methods: This retrospective data collection study was conducted for 2 years at a tertiary care hospital. Mothers who gave birth between October 2017 and 2019 were included in the study. Using Robson's method they were categorized into ten groups. In each of the ten categories, the caesarean delivery rates were calculated and analysed. The contribution of each category to the overall caesarean section rate and percentage was computed.
Results: In our hospital, 384 of the 550 women who gave birth during the study period underwent a lower segment caesarean section (LSCS), with an overall C section rate of 69.8%. Group 5 (multiparous with prev 1 or more LSCS) contributed to the highest C-sections followed by group 2 (Primi who were induced or whose caesarean section was done without labour). Although groups 6, 7, 8, and 9 did not contribute significantly to overall C-sections, C section rates in this group of patients are approaching 100%. The primis who came in spontaneous labour had the least LSCS rate (29.47%).
Conclusions: Women who have had a previous caesarean delivery and primigravidas who were induced or had LSCS without labour account for a growing percentage of caesarean deliveries. Public policies and awareness should be aimed at minimising LSCS, especially by lowering the number of elective CS in these women and supporting vaginal delivery.

Keywords: Caesarean section, Robson classification, Labour, Hospital

INTRODUCTION

A caesarean section is a method of delivering a baby through an open abdominal incision (laparotomy) and a uterine incision (hysterectomy). A foetus cannot or should not be delivered vaginally for a variety of reasons. A vaginal birth may be dangerous in some therapeutic conditions; hence some of these indications are strict. There are several indications of caesarean sections like maternal, anatomical or uterine and foetal.[1] In most countries, the rate of caesarean section (CS) deliveries has steadily increased over the previous few decades, but the reasons for this trend are not thoroughly comprehended. Rising CS rates are a serious public health concern that has sparked international debates owing to potential maternal and neonatal hazards, disparity in access, and cost concerns.[2] It is vital to have a tool to monitor and compare CS rates in the same setting over time and between various settings in order to analyse trends or observations and to propose and implement effective solutions to reduce or boost CS rates when needed. Ideally, there should be a classification system to monitor and compare CS rates at the facility level in a standardized, reliable, consistent and action-oriented manner. In 2015, WHO proposed the use of Robson's classification also known as 10 group

classification as a global standard for assessing, monitoring and comparing caesarean section rates both within the healthcare facilities and between them.[3] The system classifies all women into one of the 10 categories that are mutually exclusive and as a set, totally comprehensive. The classifications are based on five basic obstetric parameters that are collected routinely in all maternity wards; parity, no of foetuses, previous lower segment caesarean section (LSCS), onset of labour, gestational age and foetal presentation.

The WHO and the International Federation of Gynecology and Obstetrics (FIGO) recommend the Robson's classification as a global standard for assessing, monitoring and comparing LSCS rates within health care facilities over time and between facilities.[4,5]

In a county like India where the population with diversified socio-economics, geographic status observed, decision based on global data observations of the Indian population can't be directly applied unless and until data categorisation from the Indian population is derived. Robson's categorisation of the Indian population has very little data available.

At the same time, in a country like India, understanding the elements that influence CS decisions is critical. Therefore, we carried out a retrospective analysis with the aim to analyse which clinical situations contributed to and led to caesarean delivery in a tertiary care hospital, using the classification approach, and to audit the rising prevalence of caesarean sections.

METHODS

This was a retrospective study conducted for 2 years from October 2017 to October 2019 at Aakash healthcare super speciality hospital (Delhi, India). All women who delivered during this period were included in the study, the total no of women who delivered every month was counted overall and caesarean section rate was calculated these were then classified according to Robinson's 10 groups (Table 1).

Table 1: Robson's 10 group classification.

Groups	Robson's 10 group classification
1.	Nulliparous single cephalic >37 weeks gestation in spontaneous labour
2.	Nulliparous, single cephalic >37 weeks gestation, induced or CS before labour
3.	Multiparous (excluding previous CS) single cephalic, >37 weeks in spontaneous labour
4.	Multiparous (excluding previous CS)single cephalic >37 weeks, induced or CS without labour
5.	Previous CS, single cephalic >37 weeks
6.	All nulliparous breech
7.	All multiparous breech (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)

Caesarean section rate in each group was calculated and analysed. All pregnancies <26 weeks were excluded from the study. The data was collected and analysed using descriptive statistics and data was presented using percentage and proportion. Descriptive statistical analysis was done. The study was conducted after taking approval from the institutional ethical committee.

RESULTS

The total number of women who delivered over the period was 550. Total no. of caesarean section was 384 C-sections at our hospital were 69.81% (Table 2, Figure 1). This number is certainly high as per global expected percentage as per WHO. Among the LSCS deliveries, the major contributors for LSCS were Group 5 (multiparous with prev 1 or more LSCS) and Group 2 (Primi who were induced or whose caesarean section was done without labour). The 26% overall LSCS rate was contributed by primigravidas who were induced or had LSCS without labour (group 2); whereas, the previous caesarean group (Group 5) contributed 24.9%, and the normal delivery group accounted for 30.23% of the total population (Figure 2). The relative contribution to the overall LSCS rate by the different groups has been illustrated in (Figure 2) and it is observed that the LSCS rate in primigravidas in spontaneous labour (Group 1) was only 7.29%.

To increase the understanding of the data, we analysed the indications that lead to LSCS from Group 2 and named that group 2b (Table 3). The detailed analysis of Group 2 revealed that Primis who did not take a trial of labour (Group 2b) were the ones who feared trial of labour, severe pregnancy-induced hypertension, previous myomectomy, large fibroids (posterior wall), deranged Doppler, severe oligohydramnios, cephalopelvic disproportion etc (Table 3).

The primis who gave birth spontaneously had the lowest LSCS rate (29.47%). The primis who were induced (n=98) developed LSCS in 73 cases, resulting in an LSCS rate of 74.48% in this group (Group 2a).

The maximum LSCS rate was 85.11% for Groups 2a and 2b combined. The LSCS rate for multigravidas who arrived in spontaneous labour was only 10%, but the

LSCS rate for multigravidas who were induced or had pre-labour LSCS (Group 4a and 4b) was 34.78%. The LSCS rate rose with any intervention in the labour process, whether primigravida or multigravida. Group 10 included all preterms (n=47) at a gestational age of 37 weeks. In this group, 34 LSCS occurred, accounting for 72.34% of the total.

Table 2: Findings as per Robsons classifications.

S. no.	Group name	No. of CS	No. of women	Group CS rate no of CS/no. of women *100	Group size no. women in group/total no. of delivery in HP*100	Relative contrbution of group to overall CS rate no. of CS in the group/total no. of CS in Hp*100	Absolute group contrbution to overall CS rate total no. of CS/total no. diveliry *100
1.	Primi spontaneous labour	28	95	29.47	17.27	7.29	5.09
2.	Primi induced or LSCS without labour	143	168	85.11	30.54	37.23	26.00
3.	Multi spontenous labour	5	50	0.10	9.09	1.30	0.90
4.	Multi induced or LSCS without labour	8	23	34.78	4.18	2.08	1.45
5.	Previous LSCS	137	138	99.27	25.09	35.67	24.90
6.	Nulliparous breech	8	8	100.00	1.45	2.08	1.45
7.	Multi breech	3	3	100.00	0.54	0.78	0.54
8.	Twins	16	16	100.00	2.90	4.16	2.90
9.	Trasnverse lie	2	2	100.00	0.36	0.52	0.36
10.	Pre term	34	47	72.34	8.54	8.85	6.18
11.	Normal delivery						30.23
12.	Total	384	550				

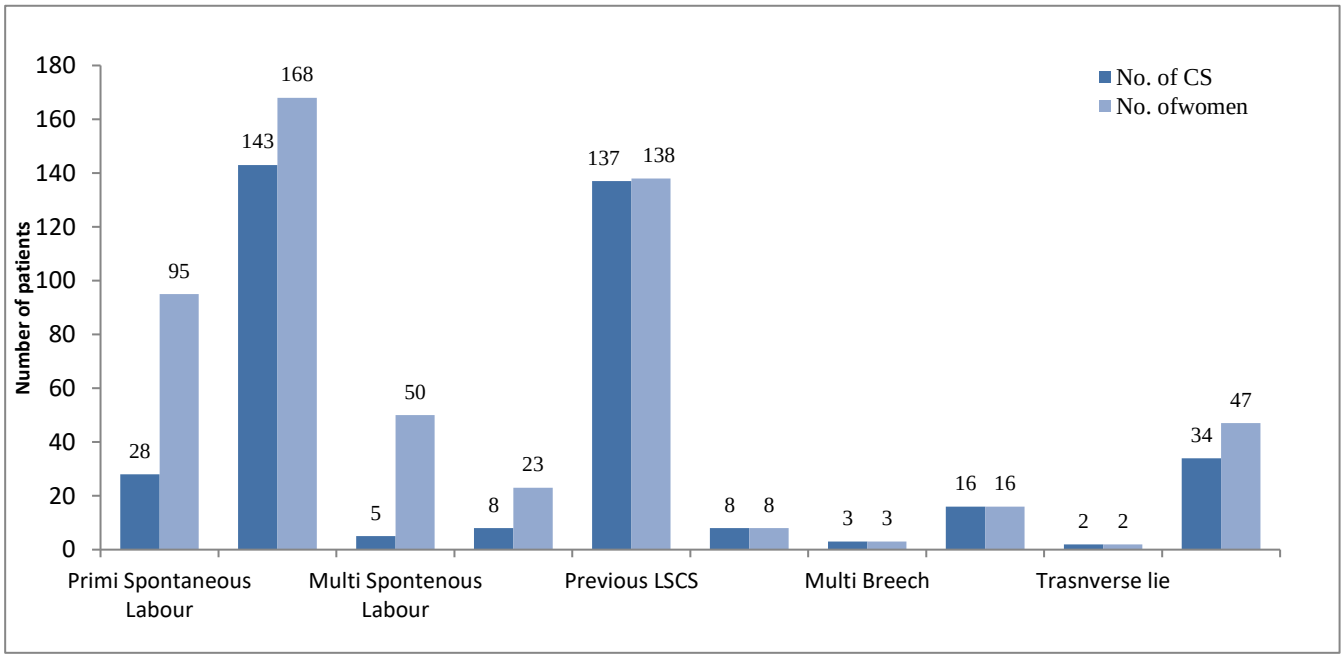

Figure 1: Caesarean sections in various groups.

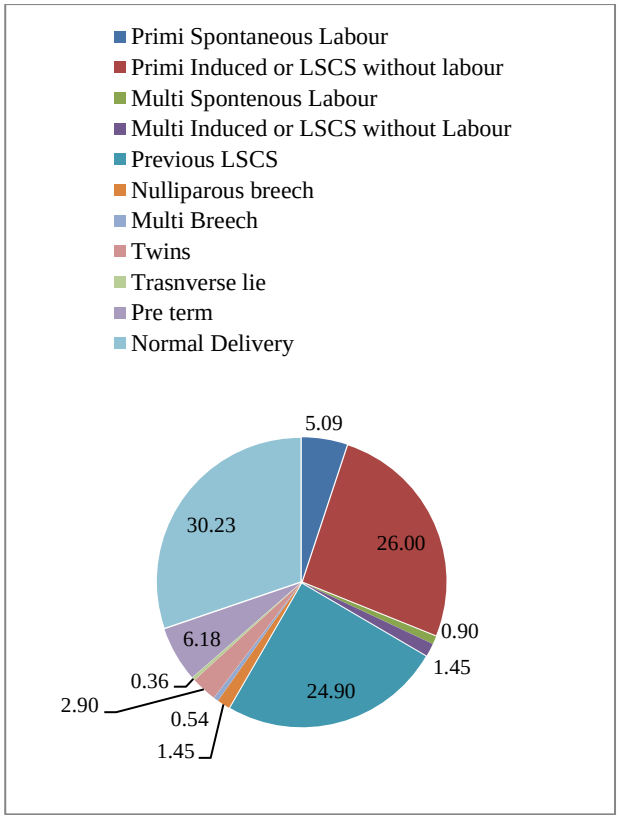

Figure 2: Absolute group contribution to caesarean rate.

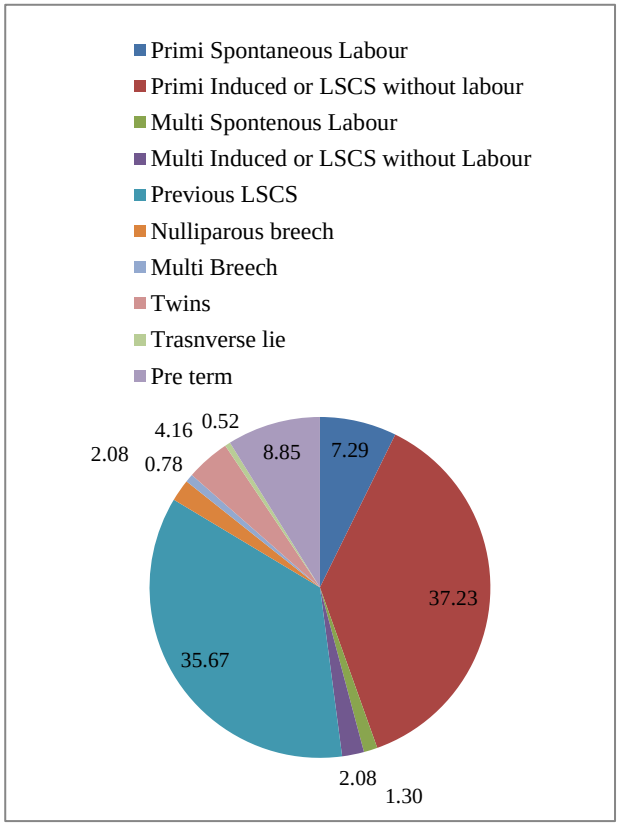

Figure 3: Relative contribution to caesarean section rate.

Table 3: Group 2b findings.

Indications for LSCS in primigravida >37 weeks without labour (group 2b)	N
Not willing for the of labour	18
Deranged dopler	4
Iugr with unfavourable cervix	3
Severe oligohydramnios AFI <5	9
Fetal distress on admission	1
Fibroid uterus with unfavourable cervix	1
CPD	11
2/3 loops of cord around neck	6
Placenta previa with APH	2
Rhd with aortic stenosis	1
GDM with uncontrolled sugar	2
Polyhydramnios with free-floating head	3
Prom with MSL	2
Previous h/o retinal detachment	1
Previous h/o IUD	2
Previous myomectomy	3
Vaginal warts	1
Total	70

DISCUSSION

This retrospective study showed that the proportion of women having a pre-labour caesarean section and the proportion of women who had previously had a caesarean section both increased across most Robson groups. Robson's classification is important to understand the trends of caesarean sections in the population. Considering the global increase in CS rate maximum data available on CS rate is from western countries. The NFHS data only talked about the CS rate in the Indian population. However further classification of such national data by government agencies is not available. By going through the NFHS -5 data we can conclude that CS rate is more in India than the defined limit of 15% by the WHO. In India, private hospital settings are more commonly using CS than the public hospital. More women may be opting for C-Section as it is considered a safe procedure by them and can also help avoid the pain that comes with normal delivery (NFHS-5). In the present study, the major contribution to the overall caesarean section is by group 5 (women with prev LSCS) followed by group 2b (primi, term cephalic induced labour or LSCS without labour). If we compare the present study details with globally published literature, similar results have been reported by Jacob et al, Ray et al and Kazmi et al.[7-9]

Mothers who arrive in active labour with advanced cervical dilation are the most likely to accomplish a vaginal birth after caesarean (VBAC). Others opt for a repeat CS to avoid the hassle of constant monitoring and the possibility of medico-legal complications if a mishap occurs. Labour induction protocols vary widely and

multiple authors have quoted increasing labour induction as an upcoming contributor to caesarean deliveries especially primary caesarean rates. Studies have shown that this is one of the major modifiable factors in reducing primary caesarean rates. Yadav et al have found that induced primis contribute even more than prev CS group to the overall CS rate. Mbaye et al also noted similar results.[10,11]

In our study, we observed that malpresentation especially breech presentation also contributes significantly to the overall as well as primary CS rates. The same was the observation by Jacob et al, Sneha et al noted 100% CS rate in breech presentations regardless of parity which was also the same in our study.[12,13] An Indian study with comparable group size Kant et al showed a result very similar to our study wherein the contribution of caesarean section by Group 5 and Group 2 were 36 and 36.71% respectively.[13] In our study, it was 35.67% (for Group 5) and 37.23% (for Group 2) respectively (Figure 3). Use of Robson's classification to assess caesarean section trends in 21 countries: a secondary analysis of 2 WHO multi-country surveys published in April 2015 in the Lancet is one of the largest studies.[14] This was a prospective study where data was collected for 314623 women from 359 facilities in 29 countries. According to this study also in all the three HDI (human development index) groups, nulliparous women (Robson classification Group 1 and 2) were the single largest contributor to the overall LSCS rate, followed by women who previously had a caesarean section (Group 5) who accounted for roughly a quarter of the rates. Their analysis showed that the absolute contribution of women with a previous caesarean section (Group 5) in medium and low HDI countries to the overall caesarean section rates increased substantially.

The risk of uterine rupture means that attempts at VBAC need to be considered with care. This analysis captures the so-called domino effect of caesarean section use: As caesarean section rates increase, more women in the obstetric population need a repeat caesarean section. To address this problem, evidence-based interventions and programmes to reduce both primary and repeat caesarean sections are needed. Therefore, implementation of evidence-based strategies to avoid a medically unnecessary primary caesarean section and to encourage safe and appropriate use of vaginal birth after caesarean section is needed.

Our findings have shown that necessary data collection and application of Robson's classification can be done quite simply and effectively. Even NFHS like surveys should also include the Robson's classification for routine monitoring and assessment purposes at the national level. Hence, more specific data and outcome measures could be taken as well as an assessment of underlying factors which are contributing to the increased rate of CS. Based on our limited institutional data which is a private hospital setting, all findings cannot be directly extrapolated to the overall Indian population which is much diversified.

CONCLUSION

According to our review the proportion of women having a pre-labour caesarean section and the proportion of women who had previously had a caesarean section both increased across most Robson groups. Public policies should be aimed at minimising LSCS, especially by lowering the number of elective CS in these women and supporting vaginal delivery after caesarean birth in multiparous women to minimise repeat CS. The first step toward lowering caesarean rates is to classify under Robson's categorization. Relevant group-specific measures can only be implemented by periodic analysis utilising the classification. Standardization of caesarean delivery indications, regular audits, and clear hospital policies will all help to reduce the caesarean section rate.

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