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Original Research Article

Analysis of cesarean deliveries in a tertiary hospital as per Robson ten group classification system

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ABSTRACT

Background: Cesarean section is the most commonly performed surgery in the department of gynecology. However, it has its own merits and demerits which affect the mother and the baby in the present as well as subsequent pregnancies. There is a rising trend of cesarean deliveries not only in India but worldwide. So, there is a dire need to audit these cesarean sections and make necessary recommendations accordingly to curb the rising incidence of cesarean deliveries in near future. Hence, the present study analysed the leading groups contributing to high cesarean rates at a tertiary hospital of Armed Forces using Robson ten group classification.

Methods: This study was conducted in a Tertiary Hospital of Armed Forces at Chandigarh. All patients who delivered in this hospital between January 2016 to December 2018 were included in this study as per the Robson ten group classification.

Results: number of patients who delivered during the time period January 2016 to December 2018 was 3136. Number of patients who delivered vaginally during the same period was 1865. Number of patients who delivered through cesarean section were 1271. Group 5 was the leading contributor to cesarean deliveries followed by groups 2 and 4 subsequently. However, there was significant contribution by group 10 to the list.

Conclusions: Groups 5, 2 and 4 are the leading contributors to cesarean sections at our institute. So, author need to introspect the labour room protocols and change our norms especially about fetal distress based on CTG monitoring and perform versions in mal-presentations if not contra-indicated to reduce cesarean section rates in near future. Even rising rates of cesarean section in elderly primis, patients conceived after infertility treatment and increasing trends of cesarean delivery on maternal request needs to be checked to reduce the rates of primary cesarean sections.

Keywords: Cesarean deliveries, Pregnancy, Robson ten group classification

INTRODUCTION

Cesarean section is the commonest surgical procedure done in obstetrics to facilitate the delivery of new-born. However, it has its own de-merits in the form of increased requirement of blood transfusion, hysterectomy and rarely death of the mother compared to vaginal delivery.

Even subsequent pregnancy is affected due to increased chances of uterine rupture and increased incidence of

Placenta praevia and accreta affecting outcome of future pregnancy.¹ There has been rising rates of cesarean section globally in the last few years not only in high risk patients but even in low risk population with singleton cephalic presentation with no other risk factors.² This rise is attributed mainly to:

- Increased number of patients with previous cesarean section
- More use of electronic fetal monitoring in labour diagnosing more cases of fetal distress,

- Increased incidence of pregnancies following infertility treatment and that too multiple pregnancies³
- Increased incidence of cesarean delivery on maternal request especially in long standing treated cases of infertility and elderly primigravidas
- Increased incidence of elderly primigravidas due to rising trend of late marriages and subsequent late conceptions
- Rising incidence of induction of labour.

Lowering the rates of cesarean sections in near future requires thorough retrospections of all the deliveries so as to pinpoint which particular subset of patients are most commonly affected by this entity. One major pitfall preventing the better understanding of this rise and its causes was the lack of any internationally accepted universal classification system for cesarean deliveries.

Michael Robson in the year 2001 introduced Robson ten group classification system to analyse cesarean deliveries and to classify them into various groups. The WHO statement (Geneva 2014) proposes the use of Robson classification as a global standard for assessing, comparing and monitoring cesarean section rates within health care facilities.⁴ RTGCS serves as an important tool to identify which category of patients have increased cesarean section rate and will serve as an important tool to compare these rising trends globally.⁵⁻⁶

METHODS

The present study was conducted at a tertiary care hospital of Armed Forces at Chandigarh. It was an

observational study conducted in Department of Obstetrics and Gynecology between January 2016 to December 2018. A total of 3136 women delivered during this period were included and classified according to Robson ten group classification system.

Inclusion criteria

- All women with period of gestation more than 20weeks and in labour were included in this study

Exclusion criteria

- All women with period of gestation less than 20 weeks and in labour were excluded from this study and labeled inevitable abortions.

Statistical analysis

Data was entered using Microsoft Excel version2013 and analysed using IBM SPSS version 20.0. Data was summarized in percentages and proportions.

RESULTS

A total of 3136 patients were delivered during the above said study period. All patients were classified according to Robson ten group classification system as depicted in Table 1. Out of total 3136 deliveries 59.5% were delivered vaginally and 40.5%were by cesarean section as shown in Table 2.

Total number of pre-term deliveries were 280 as reflected in Table 3.

Table 1: Robson ten group classification.

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

Table 2: Number of deliveries.

Total number of deliveries	3136
Number of vaginal deliveries	1865
Number of cesarean deliveries	1271

In pre-term deliveries 67.5% were delivered vaginally and 32.5% were delivered by cesarean section. 2856

patients had term deliveries in our study. In term deliveries 58.6% were delivered vaginally and 41.6% were cesarean deliveries as given in Table 3. Table 4 depicts distribution of women among different groups and cesarean section rates according to RTGCS. Group 5 which consists of multiparous women with at least 1 cesarean section and singleton, term and cephalic pregnancy is the largest contributor to cesarean section

rates followed by group 2 and 4 as per Table 4. Group 1 and 2 were nulliparous, singleton, cephalic in spontaneous labour and induced or CS done before labour respectively whereas Group 3 and 4 were multiparous with similar characteristics. Group 10 also contributed significantly to cesarean section rate as reflected in Table 4. Group 6 to 9 has significant contribution because of

associated obstetric conditions associated in these groups. In Group 1 commonest indication was fetal distress followed by NPOL, Group 2 had failed induction followed by fetal distress as the commonest indications. In Group 3 it was fetal distress followed by NPOL as common indications for CS. Group 4 had failed induction followed by fetal distress as commonest indication.

Table 3: Number of vaginal and cesarean sections in pre-term and term deliveries.

Gestational age	Number of vaginal deliveries	Number of cesarean sections	Total number of deliveries
<36 weeks	189 (67.5%)	91 (32.5%)	280 (8.9%)
>36 weeks	1676 (58.6%)	1180 (41.4%)	2856 (91.1%)

Table 4: Distribution of cesarean section across Robson ten groups.

Robson ten group	Cesarean section rate
1	25 (1.96%)
2	270 (21.24%)
3	12 (0.9%)
4	151 (11.88%)
5	548 (43.11%)
6	63 (04.95%)
7	43 (03.38%)
8	54 (04.24%)
9	21 (01.57%)
10	91 (07.15%)

Table 5: Indications for CS following failed VBAC trial.

Indication of CS in failed VBAC	Number	Percentage
Fetal distress	10	40%
Suspected scar dehiscence	08	32%
NPOL	07	28%
Total	25	100%

Table 6: Indications for repeat CS in Group 5.

Indications	Total
Patients not willing for VBAC	323 (58.9%)
Patients not eligible for VBAC	192 (35.03%)
Previous 2 or more CS	33 (6.02%)

Table 7: Analysis of CS in Group 10 patients.

Group 10	Number	Percentage
Primary CS	37	40.6%
Previous CS	54	59.7%
Total CS in Group 10	91	100%

In this study, a total of 1271 patients delivered by CS, VBAC was allowed in 58 patients. Out of 58 patients of VBAC, 33 had successful VBAC and 25 had repeat CS.

Commonest indication among failed VBAC patients were fetal distress (10 cases), suspected scar dehiscence seen in 08 patients and NPOL in 7 cases as depicted in Table 5. Commonest indication for repeat CS in Group 5 was patients with previous CS unwilling for VBAC trial followed by not eligible for VBAC trial as shown in Table 6. In Group 10 there were 37 primary cesarean sections and 54 repeat cesarean sections respectively as shown in Table 7. Common indications for primary CS were fetal distress followed by failed induction.

DISCUSSION

Cesarean section is an important parameter to assess obstetrical care services of a country. Many classification systems were in vogue to classify cesarean section in the past. However, in the year 2001 Michael Robson introduced the ten-group system for classifying cesarean sections. Later WHO in 2014 proposed the use of Robson classification as global standard for assessing, monitoring and comparing cesarean section within health care facilities. WHO identified this system as the most fulfilling so far as international and local needs are concerned.⁷ As cesarean section has long term implications on both mother and fetus, it becomes more the reason to determine indications of cesarean sections at institutional level to provide data regarding management of labour and delivery.

A total of 3136 patients who delivered during this time period were recruited in this study. All patients with gestational age >20 weeks and in labour were classified according to RTGCS. 1865 women delivered vaginally, and 1271 women delivered through cesarean section. The present study evaluated cesarean section rate of this tertiary centre to be 40.5%. This institute being tertiary centre receives high risk referral cases from peripheral centers to the tune of 35% of total obstetric population which adds to cesarean section rates of this centre. WHO propose that at a population level cesarean section rates higher than 10% are not associated with reduction in maternal and neonatal mortality rates. When compared to other studies the cesarean section rates were lower than the study conducted by Ferriari et al in Brazil (46.6%)

and Samba and Mamuni (46.9%) but was higher than the study conducted by Prameela et al (25.8%) Kazmi et al (20.3%).⁸⁻¹¹ Common indications of cesarean sections seen in our study were previous cesarean, fetal distress, failed induction and NPOL as per their frequency of occurrence.

Previous cesarean section was responsible for 43% of total cesarean sections done in this study and is similar to rates of Kazmi et al in Oman (33.3%) and Prameela et al in Mysore (32.8%). Fetal distress was the second commonest indication accounting for 24.9% of cesarean sections compared to 37.7% in study conducted by Makhanya et al in South Africa.¹² It has been observed and even proved by various RCTs that cesarean rates due to fetal distress have increased in recent past with more and more use of electronic fetal monitoring systems without much improvement in neonatal outcomes.¹³

WHO recommends intermittent auscultation of fetal heart rate every min in first stage and every 5 minutes in second stage of labour.¹⁵ However, due to risk profile of patients most of the patients have electronic fetal monitoring at Command Hospital Chandimandir, Haryana, India. Improvement in fetal monitoring during labour can reduce the cesarean section rates.

Non progress of labour was responsible for cesarean section in 6.3% of patients. NPOL contributed to 14% of cesarean in nulliparous and 9% in multiparous patients. This particular subset of population needs to be looked into so as to reduce the cesarean section rates in near future. A re-look into factors like partograph monitoring of labour, judicious use of oxytocics, skillful pelvic examination to rule out CPD and trained labour room staff will help to curb the rising rate in this category of patients. Presence of a suitable companion in labour if allowed as per hospital policy will help not only to reduce cesarean rates but also increase patient satisfaction rates.¹⁴

In this study RTGCS was used to highlight which particular subset of patients made most significant contribution to cesarean section rates. Higher cesarean section rates were seen in Group 5 followed by Group 2 and 4. Even Group 10 had significant contribution to cesarean section rates. A study by Litorp et al in Tanzania demonstrated a cesarean section rate of 27% with Groups 1, 3 and 5 contributing 12, 12 and 14% respectively.¹⁵ Nulliparous patient contributed maximally to the obstetric population. However, Group 2 was the second significant contributor to cesarean section rate with fetal distress, failed induction and NPOL as main contributors. Group 2 contributed 21% to cesarean section rates which is high in comparison with studies conducted by Kazmi et al (5.5%), Samba and Mumuni et al (6.6%), Sirsath and Risbud (8.8%), Prameela et al (9.2%), Gao et al (12.4%), Makhanya et al (14.9%), Ferriera et al (15.6%).^{16,17} This is mainly attributed to increased incidence of elective cesareans (27%) done in high risk categories like elderly

primis and patients conceived through IVF after long standing infertility treatments. Researchers indicate that if there is less induction rates in Group 2 cesarean rates automatically becomes less in this group.¹⁸⁻²⁰ Group 1 and 2 are significant contributors to obstetric population because they have most variations in terms of managements and outcomes. Appropriate management of first and second stage of labour is key element in reduction of cesarean section rate in this subset of population. Fetal distress and failed induction are significant contributors to primary cesarean section rates. Careful interpretation of fetal CTG and proper use and interpretation of partograms will reduce the rising incidence of cesarean sections because of these indications in near future. So, take home message is to individualise each case of labour and give adequate trial of labour till maternal and fetal parameters do not warrant any urgent interventions. Do not set time limit in tertiary centers. It has also been observed that if we reduce induction rates in Group 2 patients cesarean rates will automatically improve.

Group 3 and 4 are the second largest contributor to obstetric population after Group 1 and 2 with fetal distress, NPOL and failed induction being the main indications for cesarean sections. Fetal distress has been a prime factor responsible for increasing cesarean rates in Group 3 and 4.

Group 5 is the largest contributor (43%) to cesarean section rate in this study. This is in contrast the rates shown by other studies conducted all over the world. CS rate in study by Ray et al, was 8.29-28.9%, Prameela et al (8.48%-25.8%), Samba and Mumuni et al, (11.2-46.9%) and by Makhanya et al (17.2%-42.9%) mainly attributed to lesser patients keen for VBACs and even a few only eligible for VBACs.²¹ Offer VBACs to patients with 1 Cesarean unless contraindicated.²² Though the cesarean rates are high in Group 6, 7, 8 and 9 but these groups contribute only a small proportion to obstetric population so their contribution to rising cesarean section rates is not significant. External cephalic version is an important modality which must be offered to Group 9 patients beyond 36 weeks unless contraindicated to reduce cesarean section rates in this group.²³

Group 10 was the fourth largest contributor to cesarean section rates in our study. These results were in comparison to the study by Ferriera et al in Brazil. Fetal distress and failed induction were the major contributors for primary cesarean sections in this category.

However, it must be made clear that decreasing the primary cesarean section rates is the key to reducing overall cesarean section rates.

Rising trends of cesarean in elderly primigravidas, patients conceived through IVFs and even CDMR needs to be checked to reduce primary cesarean rates. So, attempts should be made to perform most cesarean

sections for obstetric reasons. For all other groups optimizing maternal health and inducing labour appropriately would work especially for group 10.

CONCLUSION

Take home message is that there is no optimal cesarean section rates in any setting due to wide variations in health status of patients. Reducing the rates of primary cesarean sections is the most crucial step in controlling overall cesarean section rates. Fetal distress, NPOL and failed induction are the main contributors to primary CS which needs to be introspected at institutional levels to curb this rising trend of CS due to these factors. Individualise labour on case to case basis and give adequate trials without setting time limits till maternal and fetal parameters do not warrant urgent interventions. VBACS need to be offered to patients with previous cesareans after proper patient selection and after proper counseling of the patients regarding risks and benefits. High risk categories like elderly primigravidas and patients conceived through IVF should be encouraged and motivated for vaginal deliveries. CDMR should be discouraged to reduce primary CS rates. Labour room protocols need to be introspected and we need to have better understanding of fetal monitoring parameters so as to curb this rising trend of cesarean sections. Robson ten group classification system is just a starting point but its better to have a common starting point so as to formulate better guidelines based on experience of various institutions to reduce this rising rate of cesarean sections which is going to be a big nuisance in future.

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