Analizing Cesarean Section Delivery according to Robson Ten Group Classification System

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Abstract

Introduction: Higher than normally accepted Cesarean Section (CS) rates raise concerns about their inappropriate use. The aim of the present study was to examine cesarean delivery rates at the Department of Obstetrics and Gynecology, ESIC Medical College Faridabad based on the Robson's Ten Group Classification System (TGCS).

Methodology: In the present retrospective study, hospital records of patients who delivered in our department during the study period (Jan'19 to June'19) were extracted and cases were classified according to Robson's TGCS of CS.

Results: In the present study a total of 1297 patients were included, of which 462 underwent CS and rest had vaginal deliveries. Applying Robson's TGCS revealed that majority of the patients were from Group 1 (30.2%) and Group 3 (31.2%). Highest CS rate was observed in Group 5 (98.1%), Group 6 (100%), and Group 9 (100%). Of all the CS done in our study population (n=462), highest contribution was made by Group 5 patients (45.5%). Group 1 contributed 25.1% and Group 2 11.5% to the total CS performed in this population. For the CS performed, previous CS was the most common indication (46%).

Conclusions: Obstetric audits at the institution level and practicing evidence-based obstetrics is required to reduce morbidity associated with CS. The Robson TGCS was found to be an easy to use tool for identifying the obstetric groups of women contributing to elevated CS rates.

Introduction

The Cesarean Section Rate (CSR) has been increasing for past many decades, which now exceeds 30% in some regions.[1] The determinants of rising CS trends worldwide are debated. Some authors have suggested that the increase is driven largely by the rising use of nonmedically indicated cesarean section, which can pose unnecessary risks to mothers and neonates.[2] Thus, higher than normally accepted CS rates raise concerns about their inappropriate use. Findings that indicate high rates of CS without medical indications exemplify this concern.[3] Robson Ten Group Classification System (TGCS) has the potential to identify groups of patients that disproportionately contribute to high CS rate.[4] The Robson TGCS uses basic obstetric characteristics like parity, previous CS, gestational weeks, type of labor onset, presentation and number of fetuses to classify antenatal women into ten different groups.[5] The TGCS is simple and easy to implement, in which each group is mutually exclusive without any obstetric risk adjustment. It can also be used to identify group-specific CS rates and enable focused intervention given that management of labor varies between groups.[6]

WHO recommends that Robson TGCS should be used at local and national levels for the monitoring and evaluation of CS rates.[7] On major asset of using such a classification system is that such a system helps institution-specific monitoring and auditing, and offers a standardized comparison method between institutions and countries. The aim of the present study was to examine Cesarean delivery rates at the Department of Obstetrics and Gynecology, ESIC Medical College Faridabad based on the Robson's TGCS.

Methodology

Study Design and Sampling

The present retrospective study was conducted in the Department of Obstetrics and Gynecology, ESIC Medical College Faridabad. Hospital records of patients who delivered in our department during the study period (Jan'19 to June'19) were extracted from the hospital database. The data were compiled according to Robson's TGCS of CS. The clinical characteristics were classified according to Robson's TGCS as follows:

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 labor.

4. Multiparous (excluding previous CS), single cephalic, >37 weeks induced or CS before labor.

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).

The study was approved by the Institutional Ethics Committee. Individual patient records were assigned a unique identification number. Only deidentified data were used for analysis and reporting.

Data Collection and Data Analysis

The data was collected from the records using a semi-structured questionnaire. The data were used to classify patients according to the Robson's TGCS. Analysis of these groups considers the following measures:

1. Relative size of the group: based on the number of women in each group divided by total number of women giving birth

2. Group specific CS Rate: which is the CS divided by the number of women in each group

3. Group contribution to total CS rate: number of CS over the total number of women undergoing cesarean

4. Group contribution to overall CS rate: number of CS over the total number of women giving birth. Clinical indications for CS were also analyzed using the International Classification of Disease (ICD) 10 code version[8] both separately and for eleven different categories based on cumulative percentage rates.

Results

In the present study a total of 1297 patients were included, of which 462 underwent CS and rest had vaginal deliveries. Applying Robson's TGCS revealed that majority of the patients were from Group 1 (30.2%) and Group 3 (31.2%), which includes women with single cephalic pregnancy at term without previous CS and who entered into labor spontaneously. Group 5 had 16.5% of the patients, Group 10 had 7.4% and Group 2 had 6.2% of the total patients. Groups 4, 6, 7, 8 and 9 had 3.6%, 2.5%, 1.2%, 0.8% and 0.3% patients respectively (Table 1). Group specific CS rates have been described in Table 2. Highest CS rate was observed in Group 5 (98.1%), Group 6 (100%), and Group 9 (100%). Group 2 and Group 2 and Group 7 had CS rates of 65.4% and 81.3% respectively. Lowest CS rates were observed in Group 3 (2%) and Group 4 (10.6%). Of all the CS done in our study population (n=462), highest contribution was made by Group 5 patients (45.5%). Group 1 contributed 25.1% and Group 2 11.5% to the total CS performed in this population. For the CS performed, previous CS was the most common indication (46%). Other indications for performing CS were prolonged or obstructed labor (11%), amniotic fluid disorder (10%), fetal distress (10%) and others (Table 3).

Table 1: Relative size of each group according to Robson's ten-groups classification system.

Robson's group	Clinical characteristics	Total number of mothers	Percentage
1	Nulliparous, singleton, cephalic, ≥37 weeks, spontaneous labor	392	30.2%
2	Nulliparous, singleton, cephalic, ≥37 weeks, 2 induced labor or cesarean section before labor	81	6.2%
3	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, spontaneous labor	405	31.2%
4	Multiparous without previous cesarean section, singleton, cephalic, ≥37 weeks, induced labor or cesarean section before labor	47	3.6%
5	Multiparous with prior cesarean section, singleton, cephalic, ≥37 weeks	214	16.5%
6	All nulliparous breeches	32	2.5%
7	All multiparous breeches (including previous cesarean section)	16	1.2%
8	All multiple pregnancies (including previous cesarean section)	10	0.8%
9	All pregnancies with transverse or oblique lie (including those previous cesarean section	4	0.3%
10	Singleton, cephalic, ≤36 weeks (including previous cesarean section)	96	7.4%
		1297	100.0%

Table 2: CS rates among women groups according to Robson's Ten-group classification system.

Robson's group	Total number of patients	Number of CS	Group specific CS Rate	Group contribution to total CS rate	Group contribution to overall CS rate
1	392	116	29.6%	25.1%	8.9%
2	81	53	65.4%	11.5%	4.1%
3	405	8	2.0%	1.7%	0.6%
4	47	5	10.6%	1.1%	0.4%
5	214	210	98.1%	45.5%	16.2%
6	32	32	100.0%	6.9%	2.5%
7	16	13	81.3%	2.8%	1.0%
8	10	3	30.0%	0.6%	0.2%
9	4	4	100.0%	0.9%	0.3%
10	96	18	18.8%	3.9%	1.4%
Total	1297	462	35.6%	100.0%	35.6%

Table 3: Clinical indications of CS in in our study population (n=462).

Indication for CS	N	%
Previous cesarean	213	46%
Prolonged or obstructed labor	51	11%
Amniotic fluid disorder	46	10%
Fetal distress	46	10%
Hypertensive disorder	32	7%
Maternal request	28	6%
Malpresentation	18	4%
Postdated	14	3%
Unknown reason	9	2%
Placenta-previa	5	1%
Total	462	100%

Discussion

In our patient population, we observed the overall CSR to be 35.6%. Dhodapkar et al reported the CS rate to be 32.6% in Southern India.[9] Similar high rates were observed in study by Patel et al.[10] and Katke et al.[11] from various hospitals in India. Majority of the patients in our study were from

Group 1 and Group 3. Robson's Group 3 has multiparous women with a singleton foetus in a normal cephalic presentation, who enter labor spontaneously at term. This group usually represents the largest group among all delivering women and was found to be representing 31.2% of the total study population. When compared with other groups, these women have a low risk

for obstetric complications and are thus less likely to have obstetric indications for CS. The group specific CS rate in this group was 2%. In Gujarat, this rate was found to be 11.6%.[12] Similarly, WHO Global survey done in Latin America found the CS rate of 10% in Group 3.[13]

Highest CS rate in our study was observed in Group 5 (98.1%), Group 6 (100%), and Group 9 (100%). In Gujarat, Groups 6 through 9 presented high rates of CS due to the particular obstetric conditions within which these are defined, which is similar to our study.[9] Similar observations were made by Kant and Mendiratta from Faridabad.[14] Of all the CS done in our study population (n=462), highest contribution was made by Group 5 patients (45.5% of all CS), a group which in fact was only 16.5% of the total population. A WHO global survey reported that although women with a term singleton cephalic pregnancy with a previous cesarean section (Group 5) represented only 11.4% of the obstetric population, this group was the largest contributor to the overall CSR (26.7% of all the CS).[10] The second and third largest contributors to the overall CSR were Group 1 and Group 2, which were responsible for 18.3 and 15.3% of all cesarean deliveries, respectively. This distribution is similar to our study. Lithorp et al studied a dataset of 137,094 women and found that the three largest groups (groups 1, 3, and 5) which contributed most to the total CS rate over the study period were Group 1, 3 and 5.[15]

The most common indication for CS in our study population was previous CS, prolonged labor and fetal distress. However, according to international recommendations of the National Institute of Excellence (NICE), none of these indications are mentioned as candidates for CS.[16] Studies have shown that with appropriate and timely intervention, many such cases can be managed successfully by normal delivery.[17]

There are a few limitations of this study. First, departmental policy regarding CS is individualized and thus the results of the present study cannot generalized to other hospitals or geographical areas. Second, we lacked data to validate reported indications of CS, as neither partograph sheet nor other objective data were available.

Conclusion

Obstetric audits at the institution level and practicing evidence-based obstetrics is required to reduce morbidity associated with CS. The Robson TGCS

was found to be an easy to use tool for identifying the obstetric groups of women contributing to elevated CS rates. The obstetric subgroup of women having highest CS rate were elective groups comprising Group 5. Also, high CS rates in nulliparous women are a cause of additional concern. By using Robson TGCS, and careful evaluation, the obstetricians can help reduce CS rates and limit perinatal morbidity & mortality.

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