International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Dogra K et al. Int J Reprod Contracept Obstet Gynecol. 2019 Apr;8(4):1288-1293
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20191091

Original Research Article

Analysis of caesarean section rate according to modified Robson's classification at tertiary care centre in Uttarakhand, India

Kusum Dogra*, Neetu Arora, Bhawna Sharma, Meenakshi Tanwar

Department of Obstetrics and Gynecology, Shri Guru Ram Rai Institute of Medical Health and Sciences, SMIH, Patel Nagar, Dehradun, Uttarakhand, India

Received: 26 February 2019
Accepted: 15 March 2019

***Correspondence:**
Dr. Kusum Dogra,
E-mail: drkusumdogra@gmail.com

ABSTRACT

Background: High caesarean section rate worldwide including India is matter of concern. The aim of this study is to analyse caesarean section rate at tertiary care centre according to Modified Robson's classification.
Methods: This retrospective study was conducted at Shri Guru Ram Rai Institute of Medical and Health Sciences (SGRRIMHS) and Shri Mahant Indiresh Hospital at Dehradun from April 2018 to September 2018. All women delivered during this period were classified according to modified Robson's classification using their maternal characteristics and obstetric history. For each group, authors calculated the caesarean section rate within the group and its contribution to overall caesarean section rate.
Results: Out of total 1302 women delivered, 395 underwent CS (30.3%).The major contribution to overall caesarean section rate was 33.4% by group 5 (Previous CS, singleton, cephalic, >37weeks) followed by 16.7% by group 1 (nullipara, singleton, cephalic, >37 weeks, spontaneous labour), 12.4% by group 3 (multipara, singleton, cephalic, >37 weeks, spontaneous labour).CS rates among various group ranges from 100% among women with abnormal lie (group 9) to 77.5% in nulliparous breech (group 6), 73.7% in previous CS (group 5) and least 11.2% in multipara induced or pre labour CS (group 4).
Conclusions: Modified Robson classification is simple, systematic, reproducible and can be effectively utilized in analyzing delivering women. Major contribution to overall caesarean section is made by previous CS.

Keywords: Caesarean section, High caesarean, Modified Robson's classification

INTRODUCTION

Ever since caesarean section has been introduced in obstetrical practice, it had revolutionized the modern obstetrical practice as many difficult instrumental delivery like midcavity forceps and abnormal vaginal delivery are obsolete now. But like any surgical interventions, it has its merits and demerits. For past few years there has been increased incidence of placenta previa, placenta accrete syndrome, risk of rupture uterus in previous CS. High caesarean birth rates are an issue of international public health concern.[1] In 1985, WHO (World Health Organisation) proposed the ideal rate of caesarean section between 10-15%.[2] In India CS rates is increasing steadily and there is wide variation in CS rates between private and public health sector.[3,4] Thus, need arises to focus on contributors and develop strategies to avoid unnecessary caesarean sections. There is need for an internationally accepted classification system for caesarean section that would allow meaningful and relevant comparison of CS rates. The Robson classification is an objective tool recommended by WHO to achieve this goal. Robson proposed a new classification system, the Robson ten group classification system to allow critical analysis according to characteristics of pregnancy.[5]

Table 1: Modified Robson's classification.

Major group	Subgroup
Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour	
Nullipara, singleton cephalic, ≥ 37 weeks	Induced
	Caesarean section before labour
Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour	
Multipara, singleton cephalic, ≥ 37 weeks	Induced
	Caesarean section before labour
Previous Caesarean section, singleton cephalic, ≥ 37 weeks	Spontaneous labour
	Induced labour
	Caesarean section before labour
All nulliparous breeches	Spontaneous labour
	Induced labour
	Caesarean section before labour
All multiparous breeches(including previous Caesarean section)	Spontaneous labour
	Induced labour
	Caesarean section before labour
All multiple pregnancies (including previous Caesarean section)	Spontaneous labour
	Induced labour
	Caesarean section before labour
All abnormal lies(including previous Caesarean section but excluding breech)	Spontaneous labour
	Induced labour
	Caesarean Section before labour
All singleton cephalic, ≤36 weeks (including previous Caesarean section)	Spontaneous labour
	Induced labour
	Caesarean section before labour

The characteristics used are:

- Single or multiple pregnancy
- Nulliparous, multiparous, or multiparous with a previous CS
- Cephalic, breech presentation or other mal presentation
- Spontaneous or induced labour
- Term or preterm births.

This classification has been widely used in various countries. It consists of 10 patient population categories that are mutually exclusive. A modification to the Robson criteria has been proposed by SOGC Committee (Society of Obstetricians and Gynecologist of Canada) which enable better comparison for CS rates. This modification includes sub classification of woman having caesarean section after spontaneous onset of labour, after induction of labour and before labour.[6] Though there have been limitation to this modification also, still it is simple, easily implementable and a robust tool to monitor Caesarean Section rates (Table 1).The aim of this study was to analyze Caesarean section rates at a tertiary care centre in Uttarakhand by using Modified Robson's classification.

METHODS

This retrospective study was conducted in the Department of Obstetrics and Gynecology at SGRRIMHS and SMIH, Dehradun from April 2018 to September 2018.All women who delivered during this period were included except women with gestational age less than 20 weeks and who delivered fetus less than 500 grams (2nd trimester abortion were excluded). Relevant obstetric data was collected from labour room delivery register like gestational age, parity, number of fetuses, presentation of fetus, whether patient presented with spontaneous labour or was induced. Women were classified according to Modified Robson classification. For each group, authors calculated and analyzed the Caesarean Section rate within the group and its contribution to overall CS rate.

RESULTS

A total 1302 women delivered in our institute from April 2018 to September 2018. All women who delivered were classified according to Modified Robson's classification. Out of 1302 women 935 underwent caesarean section. So caesarean section rate in present study was 30.3% (Table 2).

Maximum number of women 263 (20.2%) women were in group 1 followed by 258 (19.8%) women in group 3, then 226 (17.4%) women in group 2 whereas group 5 consist of 179 (13.7%) women. Least number of women 7 (0.5%) were in group 9 (Table 3). Caesarean section rate within the group ranges between 100% in group 9 (singleton, transverse or oblique lie) to 77.5% in group 6 (Nulliparous, singleton, breech) followed by 73.7% in group 5 (previous caesarean section, singleton, cephalic, term). Minimum caesarean section rate 11.1% was in group 4 (Multiparous excluding previous CS, single, cephalic, term, induced or CS before labour) (Table 3).

Table 2: Classification of women as per modified Robson's classification.

Major group	Subgroup	No. of women in the group (a)	Relative size of the group (b)	No. of CS (c)	CS rate in the group (d)	Contribution made by the group to overall CS rate(e)
Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour		263	20.2	66	25.1	16.7
Nullipara, singleton cephalic, ≥ 37 weeks	Induced	206	15.8	29	14.1	7.3
	CS before labour	20	1.5	20	100	5.1
Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour		258	19.8	33	12.8	8.4
Multipara, singleton cephalic, ≥ 37 weeks	Induced	125	9.6	6	4.8	1.5
	CS before labour	9	0.7	9	100	2.3
Previous Caesarean section, singleton cephalic, ≥ 37 weeks	Spontaneous labour	66	5.1	24	36.4	6.1
	Induced labour	16	1.2	11	68.8	2.8
	CS before labour	97	7.5	97	100	24.6
All nulliparous breeches	Spontaneous labour	17	1.3	8	47.1	2
	Induced labour	0	0	0	0	0
	CS before labour	23	1.8	23	100	5.8
All multiparous breeches(including previous Caesarean section)	Spontaneous labour	14	1	8	57.1	2
	Induced labour	4	0.3	0	0	0
	CS before labour	12	0.9	12	100	3
All multiple pregnancies(including previous Caesarean section)	Spontaneous labour	17	1.3	7	41.2	1.8
	Induced labour	2	0.15	0	0	0
	CS before labour	9	0.7	9	100	2.3
All abnormal lies(including previous Caesarean section but excluding breech)	Spontaneous labour	4	0.3	4	100	1
	Induced labour	1	0.1	1	100	0.25
	CS before labour	2	0.2	2	100	0.5
All singleton cephalic, ≤ 36 weeks(including previous Caesarean section)	Spontaneous labour	57	4.4	6	10.5	1.5
	Induced labour	61	4.7	1	0.0001	0.25
	CS before labour	19	1.5	19	100	4.8
Total		1302	100%	395		100%

Major contributor to overall CS rates were group 5 (33.4%) followed by group 1 (16.7%) then group 2 (12.4%), group 3 (8.35%) then group 6 (7.8%) (Table 3) whereas major contributor to overall CS rates among

subgroup were 5c (24.6%) followed by group 1 (16.7%) then group 3 (8.4%) and group 2a (7.3%).

Group 5 comprises of 179 women which consist of 13.7% of all deliveries. Repeat CS were done in 132 patients. Sixty-six women went into spontaneous labour but required repeat CS in 24 women, 16 were induced out of which 11 underwent repeat CS whereas 97 underwent repeat CS before labour .CS rate in this group was 73.7%. VBAC was 26.25%.

Table 3: Robson's classification.

Major group	No. of women in the group (a)	Relative size of the group (b)	No. of CS (c)	CS rate in the group (d)	Contribution made by the group to overall CS rate(e)
Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour	263	20.2	66	25.1	16.7
Nulliparous, single cephalic, >37 weeks, induced or CS before labor	226	17.4	49	21.7	12.4
Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour	258	19.8	33	12.8	8.35
Multiparous (excluding previous CS), single cephalic, >37 weeks, induced or CS before labor	134	10.3	15	11.2	3.8
Previous Caesarean section, singleton cephalic, ≥ 37 weeks	179	13.7	132	73.7	33.4
All nulliparous breeches	40	3.1	31	77.5	7.8
All multiparous breeches(including previous Caesarean section)	30	2.3	20	66.7	5.1
All multiple pregnancies(including previous Caesarean section)	28	2.2	16	57.1	4.05
All abnormal lies(including previous Caesarean section but excluding breech)	7	0.5	7	100	1.8
All singleton cephalic, ≤ 36 weeks(including previous Caesarean section)	137	10.5	26	19	6.6
Total	1302	100%	395		100%

DISCUSSION

WHO has proposed the Robson's ten group classification system as a global standard for assessing, monitoring and comparing CS rates within and between healthcare facilities in 2015 based on two multi country surveys.[5,7] Several modification of original Robson classification has been tried. Authors have used the modified Robson classification used in Canada as suggested by SOGC committee (Table 1). Jacob KJ et al has proposed TMC modified Robson's classification where total number of groups were reduced to 8 instead of 10 and each group were sub divided into 3 groups.[8]

- Spontaneous
- Induced
- CS before labour.

Also, previous CS originally distributed in variety of group was made a separate group, so that Primary CS rate as well as repeat CS rate and VBAC rate could be calculated. Dr Prameela RC et al9 have suggested modification where group 3 and 4 were subdivided based on indications for CS.[9] In present study, caesarean section rate was 30.3%. Major contribution to overall CS is by group 5 (previous CS, singleton, term, cephalic) followed by group 1 (nullipara, singleton cephalic, term, spontaneous labour) then by group 3 (multipara, singleton cephalic, term, spontaneous labour (Table 3). Major contributor to primary CS rate was by group 1 followed by group 3 and then by group 2a (Table 2). Similar findings were noted by Kazmi T et al, Helena et al and Tanaka et al.[10-12] Group 1 and 2 accounted for 37.5% of all the deliveries and CS rate in group 1 was 25% whereas CS rate in group 2a was 14% (Table 2). This was in accordance with study done in other parts of India by

Shirsath A (19.6%) and Kansara Vijay14 (20.1%). Group 3 and 4 accounted for 30.1% of all deliveries(Table 3).[13] CS rate in group 3 was 12.8% which was quite higher as compared to Shirsath A (4.8%) and Kansara V (5.4%) and in group 4 was 11.2% which is higher than study conducted by Shrisath A (6.6%).[13,14] Most likely cause of increase in this group are increase in maternal age and pre pregnancy BMI, changes in obstetric practice like widespread use of electronic fetal monitoring, induction of labour, epidural analgesia, reduce use of mid cavity forceps, on demand CS and fear of litigation among health care providers. Group 5 (Previous CS, singleton, cephalic, term) comprises of 13.7% of all deliveries and CS rate in this group was 73.7% (Table 3) which was slightly lower than that of Shrisath A (87.2%) and Kansara Vijay (98.3%) whereas CS rate in sub group 5a, 5b were 36.6% and 68.75% (Table 2).[13,14]

Previous CS who presented with spontaneous labour had more successful VBAC (Vaginal Birth After Caesarean) than patients who were induced. Any efforts to reduce repeat CS should be viewed with fresh zeal which are promoting TOLAC (Trail of labour after caesarean), proper case selection, intensive monitoring and dedicated staff. Group 6 and 7 (breech presentation) includes 5.4% of all deliveries, CS rate in group 6 was 77.5% and in group 7 was 66.6% (Table 3). However, Sneha et al have noted 100% CS rate in breech presentations.[15] Similarly Samba et al has recommended increase use of ECV for breech presentations and conduct of vaginal breech deliveries.[16]

Group 8 (Multiple pregnancy) comprises of 2.1% of all deliveries and CS rate in this group was 57.1%. Group 9 (Singleton, transverse or oblique) consists of 0.5% of all deliveries and CS rate in this group was 100% (Table 3). Group 10 consists of 10.5% of all the deliveries, this is due to the fact that it is a tertiary care centre and patients with high risk of preterm labour are being referred here. CS rate in this group was 18.9%. Best way to reduce the overall CS rate is by preventing the first CS, it is thus suggested that improved case selection for labour induction and pre labour caesarean section can reduce CS rates. VBAC and breech vaginal birth should be done wherever feasible and appropriate.

Main advantage of Modified Robson's classification is its simplicity, robustness, reproducibility and flexibility. It is clinically relevant and suitable even for low resource setting. Indication based CS classification are variable, subjective, lack clarity, deficient of relevant obstetric history and thus does not allow valid comparisons. Limitation of this study were that it does not allow analysis of CS by demand and those for specific indication like placenta previa. It does not account for preexisting medical, surgical condition or fetal distress, indication and methods used for IOL and degree of prematurity, all of which may influence the rate of CS. Group 5 include 2 different groups those who planned or needed repeat CS and those who attempted VBAC and required CS.

CONCLUSION

Modified Robson's classification is easily implementable, can be effectively utilized in analysing delivering women and determinate contributors to caesarean sections to guide the health care providers to form strategies to avoid unnecessary sections.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Dogra K, Arora N, Sharma B, Tanwar M. Analysis of caesarean section rate according to modified Robson's classification at tertiary care centre in Uttarakhand, India. Int J Reprod Contracept Obstet Gynecol 2019;8:1288-93.