AUDIT ARTICLE

The modified Robson criteria for Caesarean Section audit at Mother and Child Health Center Pakistan Institute of Medical Sciences Islamabad

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Abstract

Objective: To determine the rates of lower segment Caesarean Section and their indications using modified Robson criteria.

Methods: The retrospective study was conducted at Pakistan Institute of Medical Sciences, Islamabad, Pakistan, and comprised review of records from October 1, 2016, to September 30, 2017,related to all Caesarean Sections. The data was classified according to Robson's Ten Group Classification System. SPSS 21 was used for data analysis.

Results: Of the 6155 deliveries, 2052(33.3%) were caesarean sections. According to the criterion used, the major contributor to overall Caesarean Section rate was Group 5 which entails previous Caesarian delivery, single, cephalic, >37 weeks.

Conclusion: Women with previous scar should be assessed and offered trial of labour after caesarean section, where appropriate.

Keywords: Cesarean section, Classification, Modified Robson criteria. (JPMA 70: 299; 2020)
https://doi.org/10.5455/JPMA.293708

Introduction

The World Health Organisation (WHO) in 1985 proposed that the optimal Caesarean Section (CS) rate is 10-15%. CS rate is continuing to rise worldwide in recent decades. The rise in CS rate is associated with maternal morbidity in terms of increased blood transfusions, uterine scar rupture, placenta accreta, placenta previa and hysterectomies.[1,2]

To understand the underlying factors associated with rising CS rate, a standard classification system of CS should be implemented.[2] In 2001 came Robson's Ten Group Classification System (RTGCS) for comparing CS rates for the purpose of audit and monitoring interventions needed to reduce these rates.[1,3] In 2011, a systemic review concluded that, compared to indications-based and urgency-based classifications, women-based classification systems are best for local and international use and RTGCS among these would be the most appropriate.[4] It categorises women into 10 groups on the basis of 5 parameters i.e., parity, gestational age, onset of labour (spontaneous, induced or CS before labour), presentation, and number of foetuses.[5] This classification system has been used in institutions across the high, medium and low income countries across the world.[7] The classification was modified later by the Society of Obstetrics and Gynaecology, Canada (SOGC). This modification sub-classifies women having CS after spontaneous onset of labour, after induction of labour, and before labour.[6]

The crude CS rate alone is the most important indicator of obstetric care. Contrary to WHO cut-off point of 10-15% optimal CS rate, many studies have suggested that CS rates vary from one institution to another. This variation in the rates is due to difference in local resources, expertise, organisational policies and obstetric population with high-risk pregnancies, with institutions dealing with high-risk referral cases having higher CS rates.[7,8]

A WHO multi-country survey (WHOMCS) 2010-11 in 21 countries[8], reported a CS rate of 31.2% compared to the previous rate of 26.4% in the WHO global survey (WHOGS) 2004-08 which is significantly higher. CS rate of Sri Lanka, Brazil and Mexico, which are high on the Human Development Index (HDI), was 33%, 47% and 47.5% respectively. CS rate among moderate HDI countries was 47% for China, 39.4% for Thailand and 19.3% for India.[8] Pakistan is a medium HDI country, and, according to Pakistan Demographic Health Survey (PDHS) 2012-13, it has a CS rate of 14%. Nigeria and Nepal, which are low HDI countries, had CS rate of 20.4% and 23.9% respectively.[8,9]

The current study was planned to determine the frequency of various indications of lower segment CS using modified RTGCS[6] and to identify interventions to bring the CS rate down.

Materials and Methods

The retrospective study was conducted at Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan, and comprised records from October 1, 2016, to September 30, 2017, related to all CS procedures. PIMS is a 1000-bed tertiary care university hospital of which the Mother and Child Health Centre (MCHC), a 150-bed facility, is a component catering to Obstetrics and

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Gynaecology patients. A large number of referred cases from across country are dealt with at PIMS.

Data of all women who delivered during the study period was included. It was categorised using modified RTGCS on the basis of parity, previous CS, number of foetuses, presentation (cephalic/breech/other), and onset of labour (spontaneous/induced/CS before labour).

Data was collected from operation theatre (OT) and labour room records registers. Primary outcome measures were the percentage contribution of each group to overall CS rate, total deliveries in each group and relative size of each group in the obstetric population. Secondary outcome measures were primary CS rate (groups 1 and 2), repeat CS rate, trial of labour after CS (TOLAC) rate, vaginal birth after CS (VBAC) rate and CS rate of induced labour.

Data was analysed using SPSS 21. The number of deliveries, sections procedures, both elective and emergency, presented as frequencies and percentages.

Table-1: The modified Robson criteria.

Group	Description
1	Nullipara, singleton cephalic, ≥ 37 weeks, spontaneous labour
2	Nullipara, singleton cephalic, ≥ 37 weeks A: Induced B: Caesarean section before labour
3	Multipara, singleton cephalic, ≥ 37 weeks, spontaneous labour
4	Multipara, singleton cephalic, ≥ 37 weeks A: Induced B: Caesarean section before labour
5	Previous Caesarean section, singleton cephalic, ≥ 37 weeks A. Spontaneous labour B. Induced labour C. Caesarean section before labour
6	All nulliparous breeches A. Spontaneous labour B. Induced labour C. Caesarean section before labour
7	All multiparous breeches (including previous Caesarean section) A. Spontaneous labour B. Induced labour C. Caesarean section before labour
8	All multiple pregnancies A. Spontaneous labour B. Induced labour C. Caesarean section before labour
9	All abnormal lies (including previous Caesarean section but excluding breech) A. Spontaneous labour B. Induced labour C. Caesarean section before labour
10	All singleton cephalic, ≤ 36 weeks (including previous Caesarean section) A. Spontaneous labour B. Induced labour C. Caesarean section before labour

Table-2: Caesarean Section rates during the study.

Classification group		Number of caesarean sections (A)	Total deliveries in groups (N)	Size of each group (N/total deliveriesx100)	Rate of CS in each group (A/N)	Contribution to overall CS rate.(A/total deliveries x100)
1		293	1317	21.4%	22.2%	4.8%
2	2A	120	727	11.8%	35.6%	4.2%
	2B	139				
3		124	1890	30.7%	6.6%	2.0%
4	4A	52	500	8.1%	33.4%	2.7%
	4B	115				
5		847	1054	17.1%	80.3%	13.8%
6		52	63	1%	82.5%	0.8%
7		60	105	1.7%	57.1%	1%
8		75	124	2.0%	60.4%	1.2%
9		10	10	0.16%	100%	0.16%
10		165	365	5.9%	45.2%	2.7%
Total		2052	6155	100%	---	33.3%

Results

Of the 6155 deliveries, 2052(33.3%) were CS. Among total cesarean section emergency CS were accounted for 1460(71.2%) cases and 592(28.8%) for elective CS. Of the 2044(33.2%) primigravida, primary CS was done in 552(27%). Among 395(6.4%) women with previous one scar, TOLAC was given in 310(78%) with successful VBAC rate of 207(66.7%). No case of scar rupture was reported.

Of the 10 groups outlined by the criterion, major contributor to the CS rate was group 5 847(13.8%), followed by group 1 293(4.8%), group 2 259(4.2%), group 4 167(2.7%), and group 3 124(2%). Groups 6-10 contributed 362(24%) CS cases. The least contribution to overall CS rate was 10(0.16%) for group 9 (Table-1).

Of the total 6155 delivered women, 973(15.8%) had induction of labour. The CS rate among women with induced labour was 172(17.7%). Among women with induced labour, 588(60.4%) were primigravidae and 120(20.4%) had CS, while among 385 multigravidae, 52(13.5%) had CS.CS rate of group 2 was 259(35.6%) and group 4 was 167(33.4%). The rate of CS in spontaneous labour groups 1 and 3 were 293(22.2%) and 124(6.2 %) respectively (Table-2).

Discussion

CS rate is rising worldwide and progressively becoming higher in low-resource countries. RTGCS has 10 mutually exclusive categories for CS based on simple obstetric parameters.

The classification is a useful tool for the assessment of level of care and implementing interventions.[1] When comparing CS rates in different hospitals within Pakistan, it was found that the 33% CS rate in the current study was similar to Holy Family Hospital Rawalpindi (37%), but less than Fauji Foundation Hospital, Rawalpindi (49%) and Combined Military Hospital, Rawalpindi, (56%).[10] All these hospitals in Rawalpindi Islamabad are receiving high-risk referrals and are not representative of the community. The lack of staff and medical facilities in district hospitals in Pakistan and a large number of self-referred obstetric patients leads to overburden in tertiary care hospitals. Some government hospitals in Pakistan are also providing private healthcare in their setups. The patient preference for mode of delivery, high incentives and risk of litigation may be the reason for the high CS rates in these hospitals. Overall CS rate of 33% in the current study was higher than 30.3% in Italy, 20.3% in Muscat, and 23.1% in Ireland as the hospitals concerned had organised catchment and referral areas.[11-13] However, CS rate at PIMS was lower compared to 46.8% in Ghana, 49% in Tanzania and 46% in Egypt.[14,15]

As reported by other studies, groups 1, 2 and 5 were the main contributors to CS rate.[3,13,16] In our study, group 5was the largest contributor with 13.8% which is high compared to 7.7% observed in WHOMCS in medium HDI countries.[8] CS rate of previous scar group including CS in spontaneous labour and CS before labour ranged 51-81% in various studies.[2] In our study, CS rate within group 5 was 80.3% which is high compared to 58.2%,[12] 36%[17] and 61%[16] reported by other studies, but it was comparable to other studies that reported 81.4%[14] and 71%.[18] However, CS rate of 80.3% for group 5 was lower than 95% observed in Tanzania.[2] The variation in CS rates may be due to different management protocols of the previous scar group. Some obstetrical units do induction/augmentation of labour in previous 1 scar women whereas in many hospitals obstetricians are reluctant for VBAC due to the risk of scar rupture. The

relative size of group 5 was 17% which was higher than the expected 10.1%.[16] This is due to high number of CS carried out previously on nulliparous and multiparous women with singleton term pregnancies. Safe and appropriate TOLAC is the way forward to decrease group 5 CS rates.[14] The adequate TOLAC rate (78%) and VBAC rate (66.7%) in PIMS will lead to reduction in group 5 CS rate and repeat CS rate. These rates in our population are similar to international reports of 67%[12] and 64%.[19] In the United States (USA), the rate of TOLAC reached a nadir of 15.9% in 2006 and VBAC rate improved to 38.5% in 2008[20] which is much lower than the rate of VBAC in the current study. This low VBAC rate in the USA may be related to the litigation risks and women preference.

The relative size of group 3, multigravida in spontaneous labour, was the largest (30.7%) of the 10 groups. This finding was consistent with increased reproductive desires and fertility rate of our country.[8] The size of primigravidae population classified into groups 1 and 2 was 33.2%. This is similar to 35-42% population in this group expected by Robson.[16] The relative size of nulliparous women in group 1 and 2 was less than the 2:1 ratio owing to increased number of women undergoing inductions and pre-labour CS in group 2.

The CS rate for nulliparous women in spontaneous labour in group 1 was 22.2%. This rate is greater than the 10% suggested by Robson, 11% in Ghana[14] and 7.1% in Ireland.[13] However, it was comparable to a study in south India and in Tanzania.[2] The Primigravidae CS rate needs to be optimised in order to reduce overall CS rate. It is a low-risk group and labour protocols should be set and appropriate management of first stage of labour is mandatory.[14] Efficient uterine action should be achieved by ensuring foetal wellbeing in labour. The majority of CS procedures are carried out due to labour dystocia, so the partographic record of labour should be maintained for timely intervention and proper augmentation of labour and management should be assessed.[16]

The CS rate of 35.6% in nulliparous women in group 2 was comparable to 35% suggested by Robson.[13,16] This is due to successful inductions and medically indicated pre-labour CS in this group.[16] Moreover, this is the most important group as indication of inductions should be justified because failed inductions leading to CS will increase the size of group 5 which is already the largest group. However, CS rate of 33.4% in multiparous women induced or pre-labour was higher than 13.8% in a study.[13] This is because multiparous women in our hospital are usually at a very high risk as low-risk multiparous women have a trend towards home delivery or delivery at some nearby healthcare centres rather than at a tertiary care facility. The high rate of 13.8% CS in induced labour group as compared to 4-6% advised by Robson needs to be evaluated.[16] High overall rate of induction of labour of 15.8% in our study compared to 11.5% in a Nigerian study,[21] elective CS due to high-risk referrals, women's request and use of CS for tubal ligation as mentioned in other studies may be the reason of high rate in this group of women.[15,22] The indications for induction of labour in multiparous women and elective CS in this group should be clear and justified[13] as our rate of CS in this group is somewhat higher.

Groups 6-10 were smaller groups contributing only 5.9 % to the 33% CS rate which is comparable to 7% rate in Oman.[12] The high rate of CS within groups was due to unavoidable obstetric conditions i.e. breech, multiple pregnancy, abnormal foetal lie or high-risk preterm deliveries.[13]

The non-cephalic group (6, 7, 9) contributed 1.96% to the CS rate which is lower than 3.8% in Ireland[13] but comparable to 2.9% in South India.[23] The reluctance to perform external cephalic version (ECV) and assisted vaginal breech delivery (AVBD) has been observed in some institutions[13] so proposals for conducting hands-on practice on models and drills for ECV and AVBD should be planned. Group 9 had 100% CS rate which is the standard proposed by Robson and is a reflector of data quality.[24]

Conclusion

The modified Robson classification is an effective tool for comparison of CS rates between institutions, regions and countries. It is easy to implement and interpret recommendations for reducing CS rate. Review of induction of labour and dedicated VBAC will reduce CS rates in induced labour group and previous scar group.

Disclaimer: The text is part of a Ph.D thesis.

Conflict of Interest: None.

Source of Funding: None.

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