



Modification of Robson Classification for Caesarean Section Audit

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Abstract

Introduction

With increased safety of operative deliveries the rate of caesarean section have been increasing steadily all over the world. Analysis of the caesarean section rate of a centre would allow insight into preventable causes of the rising problem.

Objective

This retrospective study was undertaken to analyse the indications of caesarean deliveries in one year period from Jun 2017 to May 2018 using a modification of pre existing Robson's Classification System and to find out the preventable causes of caesarean section.

Method

Data retrieved from labor room register and analyzed as per modified ROBSON'S criteria

Results

Out of total 1678 women delivered during this period , 882 underwent CS (52.8%). The contribution made by previous CS group to overall CS rate was 57.6%, and the repeat caesarean section rate was 57.6% . The primary CS rate was 45.17% and the maximum contribution was made by Group 1 A (term nulliparous women in

spontaneous labour) i.e 29.8 % followed by Group 1 C (term nulliparous women with CS before labour) i.e 21 %.

Conclusion

Modified Robson system can be effectively utilised in analysing mode of delivery and provide valuable information with particular relevance to caesarean sections. Strategies to reduce the caesarean section rate should concentrate on Primigravida who are getting admission to the Hospital for safe confinement i.e not in labour. Strict Policy guidelines on Induction of labour protocols and trial of labour in the previous caesarean cases will improve the situation.

Keywords: Caesarean Section, Robson's Classification, Indications of Caesarean Section

Introduction

The worldwide rise in caesarean section rate in last three decades is a major growing health concern and cause of considerable debate due to potential maternal and perinatal risks (1). Though WHO suggested 10-15 % as the optimal CS rate (2) ,however it is difficult to determine optimal rates for institution specially Referral centres.

WHO recommends Robson's Classification System proposed by Dr Michael Robson in 2001 for audit of Caesarean Section as a global standard for assessing, monitoring and comparing CS rates within health care facilities over time (WHO Systemic review 2011). It consists of 10 groups that are mutually exclusive and based on 5 parameters like parity, onset of labor, gestational age, fetal presentation and number of fetuses (table 1).

The limitation of TGCS system includes lack of information regarding indication for induction of labor or caesarean section, existing medical, surgical or fetal diseases and the degree of prematurity, which might influence the rate of caesarean section. It also doesn't account for women who have undergone Trial of labor after caesarean section (TOLAC). Thus it is practically not possible to include such details in a comprehensive classification system like this.

The growing rate of primary caesarean section rates and the number of previous CS rates encouraged us to try certain modification in the existing system in such a way the more detailed information can be obtained regarding the delivering women without losing much of its original characteristics.

This is aimed at analysing primary and repeat Caesarean rates separately so as to understand the factors responsible for increasing Caesarean rates which would help us to plan strategies to control it. Different studies have shown that induction of labour increases chances of Caesarean Section. In this context we planned to analyze the same. The proposed modifications are as follows -

- (a) Each group further subdivided into 3 subgroups (a), (b) & (c). This helps in easy understanding and coding. The number of groups reduced into 8 instead of 10.
- (b) Previous CS group are made separate which helps us to target the primary CS rate in order to reduce the

overall CS rates. This also helps to study the VBAC rate.

- (c) Contribution made by each group to overall primary CS rate is added as separate column to calculate the primary CS rate for each group. A contribution to primary CS rate of equal to or more than 15% may be taken as significant.
- (d) Overall primary CS is calculated as sum of column C (total number of primary CS = Y) divided by sum of column A (total number of deliveries other than previous CS = X) multiplied by 100 ($Y/X \times 100$) is added as an additional row below.

Accordingly the modified Robson system is presented in (table 2)

Methods

This study was performed in Dept of Obstetrics and Gynaecology of IMS & SUM Hospital of Bhubaneswar from Jun 2017 to May 2018. All women who delivered during the period were included in the study. Relevant data was collected from Delivery records and entered in an Excel sheet. For each group individual group size, CS Rate in the group, contribution to overall CS rate and contribution to Primary CS rate were calculated and analysed. Most common indication was derived and analysed for the total study group.

Results

A total number of 1678 women delivered in our institution from Jun 2017 to May 2018. During this period total no of caesarean delivery was 882. Hence rate of caesarean delivery during the above mentioned year was 52.5%.

All 1678 women were classified according to the above mentioned modified Robson classification. Each assigned one of the eight groups and one out of 03 subgroups of each group.

All women with a previous uterine scar were classified into Group 8. Total 290 (17.31%) cases belonged to Group 8 i.e a previous uterine scar which may be due to Caesarean

or Myomectomy. In this group 35(12.1%) delivered vaginally, only 2 cases had trial of labour and successful vaginal delivery . 167 cases opted for elective caesarean section. This constituted 57.6% of all pregnant women with previous Uterine Scar. All cases of successful VBAC was in spontaneous onset of labour. In 106 cases previous single uterine scar was the only indication for repeat elective caesarean. Contribution of elective Caesarean section in a previously scarred uterus without any other associated complication to overall caesarean section rate is 16.9%.a

In the remaining 1388 women, 627 underwent Caesarean Section. Hence primary caesarean section rate is 45.17 %. The maximum contribution (29.87 %) to Primary CS Rate is by the first group i.e nulliparous ladies admitted with spontaneous onset of labour but eventually undergone caesarean section followed by elective caesarean in nullipara. When analysed further, oligohydramnious and fetal distress were found to be the two most common indications.

During the study period total 125 cases of Oligohydramnious were received in the institution out of which 89 were not in labour. 69 caesareans were done with oligohydramnious as sole indication and rest 20 associated with more than one indication. Hence contribution of oligohydramnious as sole cause of primary caesarean is 4.96%.

Discussion

The Robson system is the most widely accepted classification system available for analysing, monitoring and comparing CS rates within and between different healthcare set up in 2015 based on two multi country surveys(3,4).This system has been recommended for auditing CS rates within healthcare system by Makhanya et al (5).

In the present study,the major contribution to overall CS is by Group 1A i:e term nullipara women with spontaneous

onset labor(21.2%) followed by Group 8(18.37%) i:e women with previous scar . The third major contribution to overall CS were done by Group 1C(14.9%) i.e nulliparous women without labor .The major contributor to primary caesarean rate was also by group 1A(29.87%) . Majority of women in Group 1 A who underwent CS in labour were due to fetal distress or cephalopelvic disproportion leading to non progress of labour . Fetal distress is clinically diagnosed in labour based on amniotic fluid status and non reassuring cardiotocography (CTG) which may sometimes lead to over diagnosis of fetal hypoxia due to inter observer differences in interpretation of CTG. This can be lowered by implementing frequent teaching workshop in the obstetric unit . Role of STAN system(ST waveform analysis of fetal electrocardiogram) has been well established in some countries to determine fetal status in labour(6) but it needs proper training and experience.

Amniotic fluid volume is a predictor of fetal adaptation in labour and its decrease is associated with risk of abnormal feta heart rate tracing and meconium stained amniotic fluid . In our study out of 125 case of oligohydramnios ,69 cases were underwent CS as sole indication . Fear of intrapartum fetal complication and high rate of perinatal mortality may contribute to elective CS. A well balanced decision between vaginal delivery and caesarean section can prevent unnecessary maternal morbidity .

Ray A et al ,Kazmi Tet al,Helena et al and Tanaka et al have have shown that women with previous CS contributes maximum overall CS rates followed by term primigravida who are induced or underwent CS before labor(7,8,9,10).

Though RCOG promoted Trial of labor to all women previously delivered by an lower segment caesarean section during next pregnancy , less enthusiasm is expected for TOLAC may be because caesarean is doctor friendly, TOLAC is not. So it should be recommended

that every unit must plan protocol for labour in patient with previous uterine scar . Appropriate selection of patients and counselling in the antenatal period can increase the number of patients who undergo Trial of labour after caesarean section. Most often those who achieved a VBAC are women who come in active labor with advanced cervical dilatation, others end up with a repeat CS to avoid the risk of medicolegal issues if mishap occurs.

Labor induction protocol varies worldwide. Increasing labor inductions is an upcoming contributor to caesarean deliveries, specially primary CS rates. Studies by Ann M et al, Yadav et al, Mbaye et al have found induced primigravida underwent major proportion of primary Caesarean section (11,12,13) . In our study it contributes 9.9% of CS rates (14% of primary CS rates). Studies have suggested this as one of the major modifiable factor in reducing primary CS rates by which we can reduce repeat CS rates also . Meticulous selection of case for labor induction and pre labor CS is of utmost importance for the purpose.

ACOG has set a definite guidelines on labor management aiming to limit growing primary caesareans . They have suggested to avoid unindicated early labor inductions and to promote ECV for Breech and twin vaginal deliveries. But Robson recommended that Group 6,7,8,9 and 10 should not be targeted in trying to reduce the caesarean section rate because the relative risks are too high for minimal reduction in the numbers. Similar attempts to modify the original Robson system has been tried in Canada and Thrissur medical college (14,15) to make it more informative and user friendly , though induction in women with previous scarred uterus remains a controversy .

Robson classification system categorised women mainly based on their present characteristics with less importance

to previous obstetric events. Hence ,women with or without a scarred uterus were scattered in multiple groups. The advantage of this modified system is that it gives a clear idea regarding women undergoing CS and to identify the modifiable factors that requires intervention at various health care level to reduce CS rates ; which is a growing concern in the obstetric population worldwide .

The modified system classifies women with previous CS into separate group regardless of their other obstetric characteristics which helps to directly measure the primary as well as repeat CS rates separately . In the present scenario, the primary CS rates may be corrected to around 15% as recommended by WHO in 1985 considering the increasing number of repeat caesarean incidence.

Conclusion

The modified Robson's classification system can be effectively utilised to analyse caesarean sections and provides clear and valuable information regarding the characteristics of obstetric population with particular importance given to primary and repeat CS separately . Strategies to reduce the caesarean section rate should concentrate on Primigravida who are getting admission to the Hospital for safe confinement i.e not in labour. Strict Policy guidelines on Induction of labour protocols and trial of labor(TOLAC) in the previous caesarean cases will improve the situation.

Competing interests

The authors have no conflict of interests to declare

Table 1: Robson’s ten group classification system for caesarean section

No	Groups
1	Nulliparous,single,cephalic >37 weeks in spontaneous labour
2	Nulliparous,single,cephalic >37 weeks induced or spontaneous labour
3	Multiparous(excluding previous CS),single,cephalic >37weeks in spontaneous labour
4	Multiparous(excluding previous CS),single,cephalic>37 weeks induced or CS before labour
5	Previous CS,single,cephalic , >37weeks
6	All nulliparous breeches
7	All multiparous pregnancies(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)

Table 2 : Modified Robson’s classification

Major group	Subgroup	No. of women in the group	Relative size of the group	No CS in the group	CS RATE IN GR(%)	Contribution To Overall Cs(%)	Contribution To Primary Cs (%)
Nullipara single, cephalic, ≥37 weeks	A) Spontaneous						
	B) Induced						
	C) CS before labor						
Multipara, single, Cephalic, ≥37 Weeks (excluding Previous CS)	A) Spontaneous						
	B) Induced						
	C) CS before labor						

All single,cephalic < 37 Weeks (excluding Previous CS)	A) Spontaneous
	B) Induced
	C) CS before labor
All single,cephalic < 37 Weeks (excluding Previous CS)	A) Spontaneous
	B) Induced
	C) CS before labor
All nulliparous breech	A) Spontaneous
	B) Induced
	C) CS before labor
All multiparous breech(excluding previous CS)	A) Spontaneous
	B) Induced
	C) CS before labor
All multiple Pregnancies(excludin g Previous CS)	A) Spontaneous
	B) Induced
	C) CS before labor
All abnormal lie (excluding previous CS)	A) Spontaneous
	B) Induced
	C) CS before labor
All previos CS	A) Spontaneous
	B) Induced
	C) CS before labor
Total (last column shows primary CS rates)	Y/X * 100

Table 3

Group	Sub Group	No Of Women	Relative Size(%)	No Of Cs	Cs Rate In Gr(%)	Contribution To Overall Cs(%)	Contribution To Primary Cs (%)
1	A	552	32.9	187	33.8	21.2	29.8
	B	141	8.4	88	62.4	9.9	14
	C	132	7.8	132	100	14.9	21

2	A	208	12.4	23	11	2.6	3.7
	B	33	1.9	8	24.2	0.9	1.3
	C	22	1.3	22	100	2.5	3.5
3	A	132	7.8	33	25	3.7	5.3
	B	20	1.2	4	20	0.4	0.6
	C	39	2.3	39	100	4.4	6.2
4	A	21	1.2	17	8.1	1.9	2.7
	B	0	0	0	0	0	0
	C	21	1.2	21	100	2.4	3.3
5	A	5	0.3	3	60	0.3	0.5
	B	0	0	0	0	0	0
	C	9	0.5	9	100	5.6	1.4
6	A	19	1.1	9	47.4	1	1.4
	B	0	0	0	0	0	0
	C	17	1	17	100	1.9	2.7
7	A	5	0.3	4	80	0.4	0.6
	B	0	0	0	0	0	0
	C	12	0.7	12	100	1.3	1.9
8	A	121	7.2	88	72.7	9.9	
	B	2	0.1	0	0		
	C	167	9.9	167	100	18.9	

Primary CS rate = $627/1388 * 100 = 45.2\%$

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