ISSN 2515-8260 Volume 9, Issue 4, Summer 2022

Analysis of Caesarean Section by Modified Robson's Criteria

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Abstract

INTRODUCTION: There is growing international concern about the increased use of caesarean sections (CS), particularly in high-income countries. Caesarean procedures performed in the absence of a clinical justification do not reduce maternal or infant death rates if carried out at a rate higher than 10%–15%. Dr Michael Robson in 2001 introduced "Robson classification" (also known as the "TGCS-Ten Groups Classification System"). "All women" who deliver at a specific setting (e.g. a maternity or a region) and not only for the women who deliver by CS. It is a complete perinatal classification.

Material and Methods

This is a prospective and Descriptive Study conducted over a period of 1 year. Every 5th pregnant women admitted in the hospital in the labour room after 24th week till second stage of labour for confinement during study period. In my study, Robson classification was divided under 2 categories. i) More possibility of vaginal delivery

Low risk group - 1, 2A 3, 4A
High risk group – 5A, 5B, 7A, 7B, 8A, 8B, 10A, 10B
ii) Less possibility of vaginal delivery
-2B, 4B, 5C, 6A, 6B, 6C, 7C, 8C, 9A, 9B, 9C, 10C

Results: In my study, Group 2B followed by group 5C contributes maximum to overall caesarean section rate. Low birth weight is associated with other antenatal factors. Birth weight > 4kg not seen in this randomised study. Antenatal maternal complications leads to increase incidence of operative delivery. In my study, the most common cause of caesarean section is foetal distress followed by severe oligohydramnios.

CONCLUSION: The caesarean section (CS) rate in this study of for a health facilities in our hosptial is high. The Robson TGCS was found to be a feasible and useful tool for identifying the obstetric groups of women contributing to elevated CS rates, limitation being not able to consider indication for LSCS in this classification. The obstetric sub-groups of women having highest CS rate were elective groups comprising Robson five (previous CS), Robson 10 (preterm) and "Robson one and two" (elective term).

Keywords: Caesarean Section, Modified Robson's Criteria, Antenatal Care

INTRODUCTION

There is growing international concern about the increased use of caesarean sections (CS), particularly in high-income countries [1]. Caesarean procedures performed in the absence of a clinical justification do not reduce maternal or infant death rates if carried out at a rate higher than 10%–15% [2]. The unjustified, excessive use of clinical procedures can lead to an ever-increasing therapeutic cascade of avoidable interventions [3] and become life-threatening in the present or future pregnancies for both the women and children [4]. The worldwide rise in CS rates has become a growing public health concern and a cause for debate due to potential maternal and perinatal risks, cost issues, and inequity in access [5].

There is a high degree of variability in the reported crude rates of CS performed in different countries and regions, and there are often even significant differences between hospitals within a single region. The highest caesarean rates are observed in the Dominican Republic (56.4%), Brazil (55.6%), and Egypt (51.8%), with Africa (7.3%) showing the lowest proportion of these procedures [6]. In most European countries, the rates are about 25% to 35% [7]. In Spain, the average CS rate reported across the 17 autonomous communities, the governing entities independently responsible for health care [6] and for deploying health resources to serve the needs of their local populations, was found to be 24.5% in 2015 [8].

Achieving reductions in maternal and infant morbidity and mortality are, among others, the objectives promoted by the World Health Organization (WHO) for 2030. One of the suggested ways to meet this goal consists of avoiding clinically unnecessary caesareans [9]. However, the challenge is to keep CS rates low while ensuring safe outcomes for mothers and infants [10]. One of the main referred difficulties was the lack of a classification tool that would be feasible to be used internationally, to allow audit feedback and setting an optimal CS rate over countries. To address this gap, in 2001, Robson et al. proposed an overall classification method that facilitates an understanding of the rate of CS in a center and makes it possible to identify key subpopulation groups, all in order to inform measures aimed at preventing unnecessary procedures. [11]

Dr Michael Robson in 2001 introduced “Robson classification” (also known as the “TGCS-Ten Groups Classification System”). “All women” who deliver at a specific setting (e.g. a maternity or a region) and not only for the women who deliver by CS. It is a complete perinatal classification. “Caesarean section rates should no longer be thought of as being too high or too low, but rather whether they are appropriate or not, after taking into consideration all the relevant information.” said Dr Michael Robson. [12]

With this Robson Classification has been increasingly adopted recently in many countries like UK, Scandinavia and Canada. A modification to the Robson criteria has been proposed by SOGC Committee (Society of Obstetricians and Gynecologists of Canada) enable better comparison of Caesarean section rates. This modification includes sub-classification of women having caesarean section after spontaneous onset of labour, after induction of labour and before labour. Group 5 includes two different groups 1)

those who planned or needed a repeat Cesarean section and 2) those who attempted VBAC and required Cesarean Section [13]

The purpose of my study is to analyse and compare CS rates within and across each group and individual contribution to the overall CS rate in a facility

Material and Methods

This is a prospective and Descriptive Study conducted over a period of 1 year

Inclusion Criteria:

- Every 5th pregnant women admitted in the hospital in the labour room after 24th week till second stage of labour for confinement during study period

Exclusion Criteria:

- Not applicable

In my study, Robson classification was divided under 2 categories

i) More possibility of vaginal delivery
Low risk group - 1, 2A 3, 4A
High risk group – 5A, 5B, 7A, 7B, 8A, 8B, 10A, 10B
ii) Less possibility of vaginal delivery
-2B, 4B, 5C, 6A, 6B, 6C, 7C, 8C, 9A, 9B, 9C, 10C

Results

Table 1: Distribution of Study Subjects According to Demographic Profile.

Variable	No of Study Subjects N=1001	Percentage (%)
Age		
<19	78	7.79
20-34	879	87.81
>34	44	4.40

Table 2: Distribution of deliveries according to Modified Robson's criteria (N=1001)

Robson's Group	Total Delivery	Vaginal Delivery no (%)	LSCS no (%)	Contribution to Total CSR(%)
1	254	193 (75.98)	61(24.02)	16.22
2a	99	79 (79.79)	20 (20.21)	5.32
2b	79	05 (6.33)	74(93.76)	19.68
3	260	239(90.87)	24 (9.31)	6.38

4a	34	31(91.18)	03(8.82)	0.80
4b	14	0 (00)	14 (100)	3.72
5a	33	05(15.15)	28(84.85)	7.45
5b	00	00(00)	00	0.00
5c	68	00(00)	68 (100)	18.09
6a	05	04 (80)	01(20)	0.27
6b	00	00(00)	00	0.00
6c	11	00(00)	11(100)	2.93
7a	01	01(100)	00	0.00
7b	00	00(00)	00	0.00
7c	06	01(16.67)	05(93.33)	1.33
8a	08	01(12.5)	07(87.5)	1.86
8b	00	00(00)	00	0.00
8c	04	00	04(100)	1.06
9a	00	00(00)	00	0.00
9b	00	00(00)	00	0.00
9c	09	0(00)	06(66.67)	1.60
10a	52	52(100)	00	0.00
10b	27	14(51.85)	13(48.15)	3.46
10c	37	00	37(100)	9.84

In my study, Group 2B followed by group 5C contributes maximum to overall caesarean section rate.

Table 3: Distribution of deliveries according to possibility of vaginal delivery (N=1001)

More Possibility of Vaginal Delivery (N=756)								**Less Possibility of Vaginal Delivery (N=245)**			
Low Risk (N=642)				**High Risk (N=114)**				**Vaginal**		**LSCS**	
Vaginal		**LSCS**		**Vaginal**		**LSCS**					
No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
535	70.76	107	14.14	75	9.95	39	5.15	15	6.12	230	93.87

Table 4: Association between Booking Status and Mode of Delivery

Booking Status	**More Possibility of Vaginal Delivery (N=756)**								**Less Possibility of Vaginal Delivery (N=245)**				**Total (N=1001)**	
	Low Risk (N=642)				**High Risk(N=114)**				**Vaginal**		**LSCS**			
	Vaginal		**LSCS**		**Vaginal**		**LSCS**							
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**

Adequate Antenatal Care	148	19.60	39	5.15	19	2.51	07	0.92	02	0.81	71	28.97	286	28.57
Inadequate Antenatal Care	387	51.19	68	9.0	56	7.40	32	4.23	13	1.82	159	64.89	715	71.43
Total	535	70.79	107	14.15	75	9.91	39	5.15	15	2.63	230	93.86	1001	100

Table 5: Association between gravid status and Mode of Delivery

Gravida Status	**More Possibility of Vaginal Delivery (N=756)**								**Less Possibility of Vaginal Delivery (N=245)**				**Total**	
	Low Risk (N=642)				**High Risk (N=114)**				**Vaginal**		**LSCS**			
	Vaginal		**LSCS**		**Vaginal**		**LSCS**							
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
Primigravida	225	29.76	64	8.46	31	4.10	09	1.19	07	2.85	98	40.0	434	43.36
Multigravida	310	41.0	43	5.68	44	5.82	30	3.96	08	3.26	132	53.87	567	56.64
Total	535	70.76	107	14.14	75	9.92	39	5.15	15	6.11	230	93.87	1001	100

Table 6: Multigravida with high risk factors increases LSCS rate.

More Possibility of Vaginal Delivery	**Primigravida**		**Multigravida**	
	Vaginal	**LSCS**	**Vaginal**	**LSCS**
Low Risk	**225**	**64**	**310**	**43**
High Risk	**31**	**09**	**44**	**30**
χ^2-vaule	**0.0026**		**34.71**	
p-value	**0.9596 Not Sig.**		**0.000 Sig.**	

Table 7: Distribution of Study Subjects According to Birth Weight (N=1012)

Birth Weight		**Mode of Delivery**		**Total**	**χ2 -Value**	**p-value**
		Vaginal Delivery	**LSCS**			
Low (<2.5kg)	**No**	146	104	250	2.0976	0.1475 p>0.05 Not Significant
	%	58.4%	41.6%	100.0%		
Adequate (2.5-4kg)	**No**	484	278	762		
	%	63.5%	36.5%	100.0%		
Total	**No**	630	382	1012		
	%	62.3%	37.7%	100.0%		

Low birth weight is associated with other antenatal factors. Birth weight > 4kg not seen in this randomised study.

Table 8: Distribution of Study Subjects According to Neonatal Outcomes (N=1012)

Neonatal Outcomes		Mode of Delivery		Total	
		Vaginal Delivery	LSCS		
				No	%
Favourable	**No**	563	303	866	85.57%
	%	65.01%	34.99%		
Unfavourable	**No**	67	79	146	14.43 %
	%	45.9%	54.1%		
Total	**No**	630	382	1012	100%
	%	62.25%	37.75%		

Antenatal maternal complications leads to increase incidence of operative delivery.

Table 9 - Complications in various mode of delivery

Complications in vaginal delivery	Number	Percentage
Uneventful	548	87.68%
Birth canal injuries	63	10.08%
PPH	10	1.60%
ICU	04	0.64%
Total	**625**	**100 %**

Table 10 : Statistics of various indications of LSCS

Indications	Number	Percentage
Fetal Distress	81	21.54 %
Severe oligohydramnios	61	16.23 %
Previous LSCS not willing for TOLAC	53	14.09 %
CPD	52	13.8 %
Not willing for vaginal trial	26	6.91 %
Failure of induction	25	6.64 %
Primigravida with breech presentation	12	3.19 %
Impending scar dehiscence	09	2.39 %
Previous 2 LSCS	06	1.59 %
Previous LSCS with short interconceptional period	06	1.59 %
Previous LSCS with	05	1.32 %

preeclampsia with FGR		
Abruptio placenta	05	1.32 %
Prolonged PROM with unfavourable cervix	05	1.32 %
Deep transverse arrest	04	1.06 %
Previous LSCS with prolonged PROM	04	1.06 %
Oblique lie	03	0.79 %
Previous LSCS with breech	03	0.79 %
Previous LSCS with transverse lie	02	0.53 %
2nd baby transverse lie	02	0.53 %
Impending eclampsia	02	0.53 %
Placenta Accreta	01	0.26 %
Previous LSCS with twins	01	0.26 %
Previous 3 LSCS	01	0.26 %
Other unusual indications		
Didelphyus Uterus	02	0.53 %
Heart Disease	02	0.53 %
MCDA	02	0.53 %
Fibroid uterus	01	0.26 %
Total	**376**	**100 %**

In my study, the most common cause of caesarean section is foetal distress followed by severe oligohydramnios.

Discussion

In our study, caesarean section rate in my study 37.56 %, women who underwent induction of labor for a variety of indications were included in the study group. Maximum numbers of patients were in the age group between 20-34 years (87.81%) and minimum group of age of patient was <19 years (7.70%) and <34 years (4.40%). Similar study of Londero AP et al global aging of population with an increasing prevalence of women aged between 35 and 45 years. [13]

In our study, according to Robson criteria, women in group 1 who went into spontaneous labour had a CS rate of 16.22% as opposed to similar women whose labour was induced (group 2a) who had a CS rate of 5.32 %. Number of women whose labour is being induced is growing [14]. However, within this group the commonest indication for induction is postdates. Recently a study reviewed all births in the state of Queensland in Australia where it is standard policy to induce labour for postdates after 41 completed weeks. [15]

In our study, Group 1 being the second largest contributor with 16.22% to the overall CS rate. The CS rate in group 1 can be considered as an indicator of the quality of obstetric care in a maternity ward. Improving provider's capacities and people's access in and to emergency obstetric and neonatal care could help to effectively reduce hospital CS. So, if women have better access to health care, unnecessary referrals could be reduced and those women who need a CS could benefit from a referral. A study carried out in Senegal revealed similar findings regarding the group contribution, but with Group 1 being the second largest contributor with 34.2%. [16]

As shown in this study, when analyzing CS rates, another contributing groups to the overall CS rate was Group 2 i.e, giving the contribution rate of 5.32% and 19.68 %, 2a and 2b respectively which is not similar to other studies. In groups 3, fetal distress was the dominant indication with rates of 6.38%. This could be explained by the fact that it was about women belonging to groups with low-risk of CS, most often referred from peripheral health facilities after having made a long stay and received in an obstetric emergency context. [17]

Group 5 (previous CS, singleton cephalic, ≥37 weeks) was the second largest contributor to the overall CS rate mostly due to women having CS prior to labour (group 5c- 18.09 %). It is a common practice to recommend an elective repeat CS to women with more than one previous CS. According to another study, even though vaginal birth after one CS has been advocated as a safe option, the number of women who attempt VBAC has declined over recent years due to fear of uterine rupture. [18]

In our study "Groups 6 and 7" are generally expected to be below 4%, while in our study it was found as expected, below 4%. However, the high rate of preterm pregnancies (13%) found within the study sample did not coincide with findings from other studies. [19] High rate of preterm LSCS rate "Group 10" was mainly attributed to inadequate antenatal care received being referred for tertiary care to our institute with complications. [20]

The two other obstetric groups, "Robson 8"- multiparous breech and multiple pregnancies—also represent high group-specific CS rates although the relative size of these groups was comparatively small. Having multiple pregnancies, and especially twins, increased the likelihood of delivery by CS by four times. Similarly, non-cephalic presentation (the majority of which were breech presentation) was 1.34 times more likely to be delivered by CS. [21]

In our study, multigravida (56.64%) were more than primigravida (43.36%). When compared statistically LSCS rate in multigravida was significant. Our results showing that increases in multigravida and grand multigravida patients group are similar to the results. Despite the fact that multigravida women have had a previous pregnancy experience, the current study findings suggest that multigravida women may face more challenges than their primigravida counterparts as they adjust to becoming a mother of a second child. [22]

In my study, LSCS rate was more in preterm patients (42.2%) than in term patients (34.52%) which was statistically significant. Similar, study also supported by Unger H et al about gestational age group. [23] Gestational age in India is almost invariably confirmed by using early–first-trimester ultrasound scanning, high survival rates are unlikely to reflect an inappropriate attribution of a more mature gestational age. Additionally, our data consistently reveal that early-term birth is associated with poorer survival, health, educational, and social outcomes. [24]

CONCLUSION

The caesarean section (CS) rate in this study of for a health facilities in our hosptial is high. The Robson TGCS was found to be a feasible and useful tool for identifying the obstetric groups of women contributing to elevated CS rates, limitation being not able to consider indication for LSCS in this classification. The obstetric sub-groups of women having highest CS rate were elective groups comprising Robson five (previous CS), Robson 10 (preterm) and "Robson one and two" (elective term). However, none of these three groups are recommended candidates for CS according to international clinical guidelines. Of additional concern are high CS rates reported in nulliparous women. This increases the risk of repeat CS in the subsequent pregnancy since vaginal birth after previous CS is not a regular practice in this study population.

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