■ **Original Research Article**

Robson classification of Caesarean sections at the Federal Medical Centre, Makurdi

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Abstract

Objective: The Robson classification system is a global standard for assessing, monitoring and comparing Caesarean Section rates (CSR). The objective of the study was to classify CS according Robson classification with the view to reducing the rising CS rate in Nigeria. **Methodology**: A cross sectional study of Robson classification of CS at the FMC Makurdi, from 1st January 2018 to 31st October 2019 using the 10 Robson's groups based on six obstetric characteristics that are routinely documented: parity, previous CS, onset of labour, gestational age, fetal lie/presentation, and number of fetuses using routine labour ward and theatre registers. **Results:** Out of the 4,075 women studied, 989 were CS giving a CSR of 24.3%. Seven of these CS could not be classified into a Robson group because of uncertainty of gestational age. The groups with the greatest impact on CS rate Groups 5, 1 and 3. Group 5 accounted for 30.1% of the CSs. The second group that contributed most to the CSR in the study was Group 1 which accounted for 28.1% of all C/Ss. Group 3 contributed 12.8% of the CSs. **Conclusion:** The caesarean section rate in this study is higher than the recommended global average. This calls for efforts to reduce the CSR. Vaginal birth after Caesarean section and induction of labour for primigravida for selected cases, are recommended interventions to reduce the rising caesarean section rate in Nigeria.

Keywords: Robson classification of Caesarean sections

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INTRODUCTION

In 2015, the WHO stated that CSRs higher than 10 % are not associated with reductions in maternal and newborn mortality rates and CS should ideally only be undertaken when medically necessary [1]. Nevertheless, CS rates have continued to rise worldwide and there is some concern with this trend because of the potential maternal and perinatal risks associated with CS [2–5]. Recently, the WHO adopted the Robson classification system as a global standard for assessing, monitoring, and comparing CS rates [1]. Robson's system classifies women into 10 groups based on five obstetric characteristics that are routinely documented: parity (nulliparous, multiparous with and without previous CS), onset of labor (spontaneous, induced or prelabor CS), gestational age (preterm or term), fetal presentation (cephalic, breech or transverse), and number of fetuses [1, 6]. Compared with other CS classifications, Robson's system offers many advantages [7]. Its categories are mutually exclusive, totally inclusive and can be applied prospectively [6, 7]. In recent years, the Robson classification has been used to analyze trends and determinants of CS rates in high- and low-income countries, such as data analysis of 21 countries included in the WHO surveys [8]. The objective of this study is on reducing the CSR using Robson's classification, at the Federal Medical Centre, Makurdi.

METHODS

Source of data and subjects
A cross sectional study of caesarean section deliveries at the FMC Makurdi using from 1/1/2018 to 30/10/2019 using the delivery and operation registers.

Robson groups and covariables
The variables necessary for applying the Robson classification are: number of fetuses (single or multiple); fetal presentation (cephalic, breech or transverse); previous obstetric record (nulliparous or multiparous, with or without uterine scar); onset of labor and delivery (spontaneous, induced or prelabor CS); and gestational age at the time of delivery. We classified women into the 10 groups described by Robson [6] and into 12 groups using the subdivision of groups 2 and 4 to discriminate the women with induced labor from those with prelabor CS, and eventually combined the non-cephalic groups (6, 7 and 9) to provide the analysis. We considered that women had gone into labor if they achieved at least 4 cm of cervical dilatation. Induction of labor was defined as the use of any pharmacological (oxytocin or prostaglandins) or mechanical (Foley balloon) agent in women < 4 cm dilated. The prelabor CS group included all women who had a CS and hadn't gone into labor neither submitted to labour induction. We reported separately as group X an additional category of women not classified in a Robson group (0.2 % of all women).

The socioeconomic, demographic, and obstetric characteristics investigated were: "age" (12–19, 20–34 or $\geq$ 35 years); "parity" (0, 1 or $\geq$ 2); "number of previous CS" (0, 1, 2, or more); "type of pregnancy" (single, multiple); "induction of labour" (yes/no); "labor (induced or spontaneous)" (yes/no).

Statistical analysis
The statistical program used for analysis was SPSS, version 20.0 (SPSS Inc., Chicago, IL, USA).
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Outcome measures
The primary outcome measure was delivery through CS and the Robson's classification of Caesarean section.

RESULTS

Out of the 4,075 women included in this study, 989 were CS giving an overall CS rate of 24.3%. Seven of these CS could not be classified into a Robson group; all of them due to uncertainty of gestational age. The incidence of multiple pregnancies and abnormal lies were the same (1.2%). Groups 1, 2, 3, 4 and 5 accounted for 82.8 % of the CS, while groups 6, 7, 8, 9 and 10 accounted for 16.4% of deliveries. The previous C/S group (Group 5 alone accounted for 30.1% of the caesarean sections. Group 3 was the single

largest group in the study, comprising 46.9 % of the whole population with a CS rate of 6.6% and a relative contribution of 12.8% to the CS. Groups 1 and 5 accounted for 58.2 % of all CSs performed.

Table 1: Robson classification of Caesarean sections at the FMC Makurdi

Robson Group	Description of obstetric populations	Number of cesarean deliveries	Number of deliveries	Relative (%) size of group	CS rate (%) in each group	Absolute contribution (%) on the overall CS rate2	Relative (%) contribution on the overall CS rate 3
1	Nulliparous women, single cephalic, > = 37 weeks, in spontaneous labour	278	1506	37.0	18.5	6.8	28.1
2	Nulliparous women, single cephalic, > = 37 weeks, induced or CS before labor	58				1.4	5.9
2a	Nulliparous women, single cephalic, > = 37 weeks, induced labor	14				0.3	
2b	Nulliparous women, single cephalic, > = 37 weeks, CS before labor	44	44	1.1	100	1.1	
3	Multiparous women (excluding prev. CS), single cephalic, > = 37 weeks, in spontaneous labor	127	1910	46.9	6.6	3.1	12.8
4	Multiparous women without a previous uterine scar, with single cephalic pregnancy, > = 37 weeks, induced or CS before labor	58				1.4	5.9
4a	Multiparous women without a previous uterine scar, with single cephalic pregnancy, > = 37 weeks, induced labor	4				0.1	
4b	Multiparous women without a previous uterine scar, with single cephalic pregnancy, > = 37 weeks, CS before labor	54	54	1.3	100	1.3	
5	Previous CS, single cephalic, > = 37 weeks	298				7.3	30.1
6	All nullipara breeches	27				0.7	2.7
7	All multipara breeches (including prev. CS)	20	31	0.8	64.5	0.5	2.0
8	All multiple pregnancies (including prev. CS)	50	103	2.5	48.5	1.2	5.0
9	All abnormal lies (including prev. CS)	47	47	1.2	100	1.2	4.8
10	All single cephalic, <=36 weeks (including prev. CS)	19	30	0.7	63.3	0.5	1.9
X	Unable to classify	7	7	0.2	100	0.2	0.7
	Total	989	4075	91.7		24.3	

1. Group size (%) = n of women in the group / total N women delivered in the hospital x 100
2. Group CS rate (%) = n of CS in the group / total N of women in the group x 100
3. Absolute contribution (%) = n of CS in the group / total N of women delivered in the hospital x 100
4. Relative contribution (%) = n of CS in the group / total N of CS in the hospital x 100

DISCUSSION

The Caesarean Section rate (CSR) **was 24**.3 %. In all, **30**.**1% (298)** of women who had Caesarean sections **(989)** had a previous CS. The top three Robson groups contributing to the overall CS rate were: Previous CS (Group 5) **30**.**1**%, Nulliparous women, single cephalic, spontaneous labour at term (Group 1) 28.1% (278), and Multiparous women (excluding prev. CS), single cephalic, spontaneous labor at term (Group 3) 12.8% (127). Group 3 was the single largest group in the study, comprising 46.9 % of the whole population with a CS rate of 6.6%.

Comparison with other findings

The CSR of 24.3 % from this study is higher than the 10% - 15% recommended by the WHO (9,10). It is higher than the 2.1% reported from a population based national study in Nigeria. (11). A comparison of the CSR (24.3 %) from this study with previous studies shows that it is higher than 11.3% in the North-Western and 18.8% in the South-Eastern Nigeria (12,13). It is less than the 40.1% reported from South-Western Nigeria (14) and 10%, 15% (15,16) reported from this same facility which is in North Central Nigeria. These health facility-based studies do not give a true reflection of the prevalence of CS at the population level in Nigeria. Tertiary health facilities in Nigeria, receive a greater proportion of high-risk patients and would more likely perform a greater number of caesarean deliveries. The increase in the use of CS worldwide involves multiple factors and interactions, including women and families' preferences, health professional's views and beliefs, convenience, remuneration, healthcare organisation and financing structures (17-27). CSRs continue to increase around the world without a clear understanding of the main drivers and consequences. The CSR has been rising steadily in Nigeria without corresponding evidence

for a better maternal and neonatal outcome. Robson classification of CS from our study shows that previous CS is the main driver of the rising CSR in our health facility. The second group that contributed to the CSR in the study was nulliparous women, single cephalic, spontaneous labour at term which accounted for 28.1% of all CSs. These high CSR is worrisome because the current low threshold for CS may bring unnecessary harm to women`s and baby`s health.

Strength and limitations

This study is very important for planning interventions to address Caesarean section related issues. This is the first study using the Robson's classification to assess C/S rates at the facility using primary data. The use of all essential information in Robson's classification minimized the problem of using routine data. Because of the study design, this study can only be extrapolated to women who give birth in tertiary hospitals in Nigeria. A limitation of the study is the potential miscalculation of some women who belonged to groups 1 and 3 who were erroneously classified as groups 2 and 4 because of definitions used for labour induction. This will not however affect the main findings of the study. Other possible limitation of the study was inadequate data for further classification of women in groups 2 and 4.

CONCLUSION

The caesarean section rate in this study is higher than the recommended global average. This calls for efforts to reduce the CSR. Vaginal birth after Caesarean section and induction of labour for primigravida for selected cases, are recommended interventions to reduce the rising caesarean section rate in Nigeria.

Conflict of interest
There is no conflict of interest.

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