

An Analysis of Caesarean Sections in a Community Cottage Hospital in Nigeria's Niger Delta Using The Robson Classification

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Abstract

Background: The Robson ten group classification is recommended for classifying and comparing Caesarean Sections. This study aimed to review and classify all CS done at Obio Cottage hospital in 2018 using the Robson classification and to also identify areas of possible interventions in reducing the CS rates.

Methodology: A retrospective review of all caesarean sections at Obio Cottage hospital from January to December 2018 using the Robson classification.

Results: The CS rate was 32.4%. Three groups - Groups 1 (27.%) , 2 (11.2%) and 5 (30.1%) contributed 68.5% to the overall CS rate. Group 8 had the least contribution to CS with 3.4%. Women in Robson group 3 had the lowest group CS rate of 6.86%, while the group CS rate for group 1, and 5.1 were 26.34% and 70.49% respectively.

Conclusion: The CS rate of 32.4% is comparatively high. This analysis of the CS using the Robson classification system has revealed areas for further scrutiny and intervention. There is need to review the package of care provided to women in labour and increase the number of women offered a trial of labour after a Caesarean birth.

Keywords: Caesarean Section; Robson Classification; Obio Cottage Hospital; Nigeria.

Introduction

Caesarean section CS is one of the commonest obstetric surgical procedures. It is an intervention performed to prevent fetal or maternal morbidity and in some cases mortality.¹ Over the decades there has been concerns about the increasing rates of CS in most parts of the world.^{2,3} On the other hand there are worries that some women needing CS do not have access to this life saving procedure.³⁻⁵ CS rates are influenced by population characteristics and the practice in a health facility and so may justifiably vary from facility to facility and from population to population.^{6,7} However, the World Health Organization did recommended a CS rate of between 10-15 % at the population level.^{1,8}

Evaluation and comparisons of CS rates within facilities over time and between facilities and populations have been challenging due to the different classifications of CS used when auditing.⁸ CS can be classified according to the timing of the procedure, the indications for the procedure and the characteristics of the women undergoing the procedure.⁹ In a systematic review of the different classifications of CS, Torloni recommended that women based classification of CS is the best

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classification method.⁹ Furthermore, the Ten Group Classification System (TGCS) otherwise known as Robson classification was suggested as the best form of classification using patient characteristics.⁹

The Robson classification for CS utilises five easily identifiable maternal and obstetric parameters to classify patients.¹⁰ The parameters are, parity (nulliparous or multiparous), onset of labour (spontaneous, induced or pre-labour caesarean section), gestational age (preterm or term), fetal presentation (cephalic, breech or transverse), and number of fetuses (single or multiple). Women are classified into 10 mutually exclusive groups (groups 1-10). Groups 2, 4 and 5 are further subdivided into 2 subgroups.

WHO analysed the performance of Robson classification in two systematic reviews.^{9,11} The value, benefits and potential drawbacks were reviewed and thereafter WHO concluded that, 'the Robson classification is the most appropriate system to fulfil current international and local needs'.⁹ Furthermore, WHO described the Robson classification as, 'simple, robust, reproducible, clinically relevant and prospective'.⁹ FIGO has also endorsed the use of Robson classification for CS.¹²

Since the adoption of the Robson classification, many subsequent studies on CS have utilised this classification in reporting CS at the facilities and population levels.¹³⁻¹⁶ However recent reports on CS from Nigeria have not utilised the Robson classification^{14,17} although a multicountry study which included data from Nigeria applied the classification.¹⁸

This study was a retrospective analysis of CS done in a busy community secondary health care facility in South-south Nigeria. To the best of our knowledge, this is the first report of CS in a health facility in Nigeria using Robson's classification. The objective is to document the pattern of CS in the health facility using the internationally recommended Robson classification. This would provide a basis for international comparison of CS rates and also a comparison for trend over time in subsequent future reviews. It would also provide data to audit CS and inform strategies that would reduce the CS rate in the facility.

Materials and Methods

This was a retrospective analysis of all deliveries conducted at the Obio Cottage Hospital over a 12 month period between January and December 2018.

Study Setting

Obio Cottage Hospital is a secondary health facility in Port-Harcourt, Rivers State, South-south Nigeria. The facility began as a primary health centre in 1978, but was upgraded to a secondary care facility in 2010 with the support of The Shell Petroleum Development Company of Nigeria Limited and its joint venture partners (SPDC JV). It operates a successful community health insurance scheme, through a public, private, people partnership (PPP) approach, where Shell, the Rivers state government and a cluster of 4 communities have catalysed an innovative service delivery that provides accessible, affordable and quality assured health care to the population served in the surrounding communities.¹⁹ It is a major contributor to the healthcare delivery system in the Obio-akpor local government and its environs. It has an average monthly antenatal booking visits of 400, total monthly antenatal visits of 2500, and a delivery rate of about 300 babies per month.

The total number of deliveries and their hospital numbers were collected from the labour ward register. The cases notes were retrieved from the medical records and reviewed using a data proforma to extract relevant data. Robson classification was done using the Robson classification calculator version 2.0 developed by Leonardo Torres Branco. Data analysis was done using EpiInfo Statistical software. Descriptive statistics was used in the analysis and results are presented in percentages and proportions.

Ethical approval for the study was obtained from the Health Research Ethics Committee of the Delta State University Teaching Hospital.

Result

During the 12 months study period there were a total of 3318 deliveries consisting of 1083 CS and 2235 vaginal deliveries. The CS rate was 32.64%. Three thousand and seventy-nine case notes (92.80%) were successfully retrieved from the medical records and formed the sample size for the analysis.

Obstetric population

The mean age of all the women who delivered in the health facility was 30.38 ± 4.40 years with the youngest 15 years and the oldest 47 years. Table I shows the other characteristics of the women. Majority had tertiary education and almost all were booked for antenatal care. Robson group 1 (Nulliparous women with single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour) and 3 (Multiparous women without a previous uterine scar, with single cephalic pregnancy, ≥ 37 weeks gestation in spontaneous labour) had the largest number of women representing 28.48% and 37.93% respectively of the total population size. The least group size was 2B (Nulliparous, singleton, cephalic, ≥ 37 weeks' gestation, caesarean section before labour) and 4B (Multiparous without a previous uterine scar, with singleton, cephalic pregnancy, ≥ 37 weeks' gestation, caesarean section before labour) representing 0.58% and 0.55% respectively of the total population.

The sum of the size of groups 1 and 2 was 36.56% with a group 1: group 2 ratio of 3.5. The sum of size of groups 3 and 4 was 42.90% with a group 3: group 4 ratio of 7.63. The size of group 8 (multiple gestation) was 1.62% while the size of group 10 was 3.48%.

CS rate and contribution of groups

The CS rate for the 3079 retrieved casenotes was 29.13%. Three groups - Groups 1 (27.%) , 2 (11.2%) and 5 (30.1%) contributed 68.5% to the overall CS rate (Table II column 7). Group 8 had the least contribution to CS with 3.4%. Groups 4, 6, 7, 9 and 10 each contributed less than 5% to the overall CS rates.

Group CS rates

Women in Robson group 3 (multipara without any previous scar in spontaneous onset of labour) had the lowest group CS rate of 6.86%, although this may be considered higher than average (Table II column 5). The group CS rate for group 1, and 5.1 are comparatively high at 26.34% and 70.49% respectively. Women in groups 2B, 4B and 6 all had CS.

Table II presents the Robson report table as recommended by WHO.²⁰

Indications for CS

The indications for CS was classified using the Anderson and Lomas hierarchical classification for the major indications.²¹ Dystocia (36.19%) and Previous CS (32.96%) were the major indications for CS. Breech, fetal distress and other indications accounted for 7.79%, 6.12% and 16.94% respectively.

Table 1: Characteristics of Women who delivered at the health facility

Characteristics		Number of women	Percentage
Age	15-19	11	0.36
	20-24	233	7.57
	25-29	1111	36.08
	30-34	1185	38.49
	35-39	450	14.62
	40-44	88	2.86
	45 and above	1	0.03
Education	Nil	4	0.13
	Primary	19	0.62
	Secondary	788	25.59
	Tertiary	2268	73.66
Booking status	Booked	3072	99.77
	Unbooked	7	0.23
Parity	0	1231	39.98
	1	954	30.98
	2	606	19.68
	3	208	6.76
	4	56	1.82
	5	19	0.62
	6	5	0.16
Previous CS	None	2680	87.04
	1	324	10.52
	2 or more	75	2.44
Number of fetus	Singleton	3025	98.25
	Multiple	54	1.75
Fetal lie & Presentation	Cephalic	2948	95.75
	Breech	93	3.02
	Transverse/oblique	38	1.23
Gestational age	Term	2963	96.23
	Preterm	116	3.77
Onset of labour	Spontaneous	2419	78.56
	Induction of labour	378	12.28
	Pre labour CS	282	9.16

Table 2: Robson Report Table for Deliveries at Obio Cottage Hospital

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Robson group	No of CS in group	Total no in group	Group size %	Group CS rate %	Absolute contribution to CS rate	Relative group contribution to CS rate
1	231	877	28.48	26.34	7.5	27.2
2	102	249	8.08	40.96	3.3	11.2
2A	84	231	7.50	36.36	2.7	9.2
2B	18	18	0.58	100	0.6	2.0
3	80	1168	37.93	6.86	2.6	8.8
4	33	153	4.97	21.57	1.1	3.5
4A	16	136	4.42	11.76	0.5	1.7
4B	17	17	0.55	100	0.6	1.8
5	275	360	11.72	76.39	8.9	30.1
5.1	203	288	9.35	70.49	6.6	22.1
5.2	72	72	2.37	100	2.3	8.0
6	37	37	1.20	100	1.2	4.1
7	36	39	1.27	92.31	1.2	4.0
8	31	50	1.62	62.00	1.0	3.4
9	34	37	1.20	91.89	1.1	3.5
10	38	107	3.48	35.51	1.2	4.2
TOTAL	897	3079	100	29.13	29.1	100

Table 3: Comparisons of group CS rates at OCH with other studies

Robson group	Obio Cottage Hospital	Low HDI Countries ¹⁸		Robson <i>et al.</i> ²⁶	Hehir <i>et al.</i> ²⁷	Scarella <i>et al.</i> ³³	Recommended group CS rates (Robson <i>et al.</i> ²⁶)
		WHOGS (2004-2005)	WHOMCS (2010-2011)				
1	26.34	11.4	14.8	7.3	12.3	21.6	-
2	40.96	46.4	57.8	34.7	44.6		
2A	36.36	28.3	30.3		25.5	41.5	25-30
2B	100	100	100		100	100	
3	6.86	5.2	6.8	1.1	4.4	5.8	3
4	21.57	29.6	44.7	12.5	35.4		
4A	11.76	12.3	18.2		8.1	12.5	4-6
4B	100	100	100		100	100	
5	76.39	63.2	72.1	61.0	87.8		50-60
5.1	70.49					68.9	
5.2	100					96.3	
6	100			93.2	96.7	100	
7	92.31			85.0	92.4	92.3	
8	62.00			63.2	69.1	90	
9	91.89			100	67.4	100	100
10	35.51			37.8	37.9	52.2	

Discussion

The overall CS rate during the study period was 32.4% which can be considered high compared to the 14.5% CS rate obtained from the WHO Global survey and 20.4% from the WHO Multi-Country survey for Nigeria.¹⁸ However, ours is a facility based CS rate while the WHO Global survey and the WHO Multi-country survey reported population based CS rates. Furthermore there has been a time lapse of 8 years between our study and the WHO multi-country survey. While a CS rate of 10-15% has been suggested at the population level, there is no consensus as to what should be an appropriate CS rate for facilities since this would be determined by the obstetric population served by the facility, the

capacity and resources of the facility and the clinical management protocol used by the facility.⁸

Compared with other facility CS rates in Nigeria published in the last 5 years, the CS rate of 32.4% obtained in our study is high. In a tertiary health institution in the Northern part of Nigeria a CS rate of 11.3% was recorded²², while in another tertiary health facility in North west Nigeria the CS rate was 17.69%.²³ In South East Nigeria, a CS rate of 23.3% was recorded in the last year of a 10 year review.²⁴ On the other hand, in a study from a tertiary hospital in South West Nigeria, 712 out of 1370 parturients had caesarean delivery giving a high CS rate of 52%.²⁵ Our facility offers secondary health care level maternity services and a CS rate of 32.4% appears high.

Using the - Robson 10 group classification system to classify CS offers a starting point for the indepth evaluation of CS rates. Our obstetric population at Obio Cottage hospital is not a typical high risk obstetric population. Robson group 1 and 3 constitute about 66% of our obstetric population. These are nullipara and multipara without any previous CS and with singleton, term, cephalic presenting fetus who came in spontaneous labour. These women should ordinarily have a low CS rate, however our study obtained a CS rate of 26.32% for group 1 and 6.86% for group 3. A CS rate of not more than 10% for group 1 and not more than 3% for group 3 has been recommended as appropriate.²⁶ It therefore suggests that an indepth review of the labour course and management in this group of women would yield actionable strategies to reduce CS rates in this groups. However, it is to be noted that with the increased safety of CS and the implementation of the community health insurance scheme in the hospital which has removed the financial barrier to CS some women in labour do request for CS rather than complete the process of labour. None-the-less, the community health insurance scheme operational at the hospital has greatly improved access to urgently needed interventions during pregnancy and labour in the hospital and has contributed to uptake of maternity services by the community.¹⁹

Groups 1, 2 and 5 were the major contributors to the overall CS cases, contributing 68.5% of all CS

cases. Group 2 are Nulliparous women with a single cephalic presenting fetus at term who were either induced or had pre-labour CS. We had a CS rate of 40.9% in group 2 and this compared favourably with that of 44.6 % by Hehir *et al*²⁷, 46.4% and 57.8% by Vogel *et al*¹⁸ but higher than the 34.7% obtained by Robson *et al*²⁶ (see table III). A subanalysis of group 2 into 2A and 2B showed that our CS rate in 36.36% for 2A is much higher than that obtained in other centres. Group 2A represents nulliparous women with a singleton cephalic presenting fetus at term who had induction of labour. A CS rate of between 25% - 30% has been recommended for this group.²⁶ This suggest that a possible area for further review would be our induction protocol and how well the guidelines for induction are implemented.

Group 5 was the highest contributor to CS in our series (30.1%). This group consists of women with a previous one CS or two CS and the group size was 11.72% in our study. It has been suggested that this group size should not be more than 10%.²⁶ A subanalysis into group 5A and 5B revealed that our CS rate for women with one previous CS was comparatively high at 70.49%. This is not unexpected, in our centre we follow a policy of not inducing labour or augmenting labour for women with one previous CS. This policy was introduced as a safety response to past incidences of ruptured uterus that occurred in women with one previous CS with oxytocin use for either induction or augmentation. Nonetheless this group represents a possible area for intervention to reduce the CS rate. More women should be offered trial of labour after CS (TOLAC) and perhaps a cautious introduction of low dose oxytocin for women with one previous CS under very close supervision.

Dystocia (36.19%) and previous CS (32.96%) were the top two main indications for CS in our study. In our classification of indications, dystocia represented a broad indication that encompassed indications such as obstructed labour, prolonged labour, slow progress, cephalopelvic disproportion and cervical dystocia. Some of these conditions could be overcome by judicious use of oxytocin.²⁸ A Cochrane review of the package of care for active management of labour in low-risk women concluded that active management of labour resulted in a reduced CS rate and shortened duration

of labour compared to routine care.²⁹ The package of care in active management of labour proposed by O'driscoll included, one-to-one support in labour, routine amniotomy, the use of the intravenous drug oxytocin, strict criteria for the diagnosis of labour, strict monitoring of progress in labour by plotting on a partogram and strict criteria for identifying slow progress and fetal compromise.³⁰ In a busy health facility like ours with a high patient to skilled birth attendant ratio, this package of care may not be guaranteed. It is also possible that some decisions for CS may have been taken solely based on the duration labour despite the absence of any features suggestive of maternal or fetal compromise. WHO has recommended that it may be permissible to allow women who are not moving at a cervical dilatation rate of one cm per hour to stay longer in labour as long as the maternal and fetal conditions are stable.³¹ Some would eventually achieve vaginal delivery and therefore reduce the CS rate.

This analysis of the CS rates in our facility using Robson ten group classification system has enabled detailed comparisons with reports from other centres and revealed areas for further scrutiny and possible intervention. It has also established a baseline on which subsequent audits of the CS from the centre can be compared. It has been demonstrated that regular auditing of CS using the Robson classification and making the audit available to medical staff managing pregnant women has resulted in a reduction of CS rates.³² To the best of our knowledge this is the first report of facility CS using Robson Ten group classification system in Nigeria. It is hoped that this would encourage other researchers from Nigeria to report their CS using the Robson classification.

Conclusion

The CS rate was 32.4% with Robson groups 1,2 and 5 being the major contributors (68.5%) to the overall CS cases. Dystocia was the commonest indication for CS. The analysis of CS using the Robson classification identified obstetric groups for targeted intervention. Furthermore women with one previous CS are to be encouraged to have a trial of labour after Caesarean. Already, some interventions in the package of care provided to women in labour have been initiated in 2019 and hopefully this would produce a demonstrable reduction in CS to be

reported in subsequent reviews.

Conflict of interest statement

The authors have no conflict of interest to declare.

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