Original Research Article

A Five-Year Review of Caesarean Section at the Rivers State University Teaching Hospital, South-South, Nigeria.

ABSTRACT

Background: Caesarean section (CS) is a major obstetric surgery done for pregnant women and is lifesaving.

Aim: The study was aimed at reviewing CS at the Rivers State University Teaching Hospital (RSUTH), to determine the prevalence, trend and indications, for improved management outcomes.

Methods: In this cross-sectional study, we reviewed five thousand, five hundred and ninety-eight (5598) cases of caesarean sections (3699 emergency, 1899 planned) managed at the RSUTH from 1st January,2015 to 31st December,2019. Data collected were analysed using IBM, Statistical Product and Service Solutions (SPSS), version 25.0 Armonk, New York.

Results: There were 13,516 deliveries and 5,598 cases of CS over the review period, giving the prevalence of CS as 41.4 % or 414 per 1000 deliveries. Emergency and planned CS cases accounted for 66.1% and 33.9% respectively. An increasing trend of CS was observed over the review period. The mean age ± SD of the participants was 32.30±1.04 years (95% CI:30.26,34.34). Modal age group was 35-39 years, accounting for 33.2% followed by those aged 30-34 years (26.2%). Majority of the patients were multipara [3396 (60.7%)], married [4890 (87.4%)], Christians [5540 (99%)] and had tertiary level education [2800 (50%)]. The commonest indication for CS in RSUTH was previous caesarean section [1925(34%)], followed by cephalopelvic disproportion [757(13.4%], foetal distress [418(7.4%)], preeclampsia [390(6.9%)] and multiple gestation [252 (4.5%)].

Conclusion: The rate of caesarean section is high in RSUTH with an increasing trend. Although CS is lifesaving, efforts should be made to reduce the rate to the level recommended by WHO, especially in Low-middle-income countries (LMICs), where there is high aversion to CS.

Keywords: Caesarean section; Prevalence; Trend; RSUTH; Port Harcourt; Abdominal delivery.

1. INTRODUCTION

Globally, caesarean section is one of the major obstetric surgeries done for pregnant women. It is lifesaving; and involves a surgical incision made on the anterior abdominal and uterine walls to deliver the foetus and placenta, after the period of foetal viability [1, 2].

Although caesarean section may be the only option to save the lives of the parturient and/or foetuses in certain conditions, there is a high aversion to it, especially in sub-Saharan Africa.

The rate of caesarean section varies across regions and countries of the world [3-5]. The CS rates in Latin America and the Caribbeans are known to be higher compared to the rates in African. A rate of 40.5% has been reported in Latin America and the Caribbeans, followed by 32.3%, 31.1%,25.5%,19.2% and 7.3% in Northern America, Oceania, Europe, Asia and Africa respectively [3]. In most countries in West African, the rate of caesarean section ranges from 15-20%. In Nigeria, the rate of CS is between 20 – 30% in most tertiary hospitals [2]. Generally, the incidence of caesarean section is on the increase, mainly due to increasing number of women with previous caesarean section [6], women's request and preferences, improved surgical techniques [7, 8].This increasing rate of CS worldwide is a major issue of concern in maternity care [6]. Although caesarean section prevents foeto-maternal morbidity and mortality when medically indicated, there is no evidence showing its benefit when not required[9].

In 1985, World Health Organization (WHO) working group expressed concern about increasing rate of CS worldwide and with available evidence as at then, stated that a CS rate of more than 10-15% in any region is of no additional benefit in reducing foeto-maternal morbidity and mortality [9, 10]. Whereas this range was meant for 'population' defined by different geographical boundaries [9], often it has been erroneously used as yardstick for health facility without considering their peculiarities. Despite lack of a consensus on the ideal rate of CS, recent WHO statement following ecological analysis and systematic review also concluded that, caesarean section rates more than 10% were not associated with reduced foeto-maternal morbidity and mortality [9, 11].

Increasing rate of CS has been linked to some of the following factors amongst others: previous caesarean section, cephalopelvic disproportion, use of foetal scalp sampling , electronic foetal monitoring, breech presentation, extremes of age, nulliparity and grand multiparity, height < 150cm, foetal macrosomia [2, 7]. This study was aimed at reviewing cases of caesarean sections managed in Rivers State University Teaching Hospital, over a five-year period, to determine its prevalence, trend and indications, for improved management outcomes.

2. MATERIAL AND METHODS

This cross-sectional study was carried out at the Rivers State University Teaching Hospital (RSUTH) in Port Harcourt, Nigeria's South-South region. RSUTH is the Teaching Hospital of the College of Health Sciences, Rivers State University. The hospital is owned and funded by the Rivers State Government of Nigeria [12]. It is situated in the heart of Port Harcourt, the capital of Rivers State, which has a population of 5,198,716 from the last national census conducted in 2006, making it the 6th most populous state in Nigeria [13]. RSUTH is a tertiary health facility, and receives referrals from both private and public hospitals within and outside the State [14].

Records of all cases of caesarean sections carried out in our hospital from 1st January, 2015 to 31st December 2019 were retrieved and reviewed. A study proforma was personally designed for data collection. The variables considered were patient's sociodemographic characteristics such as age, parity, religion, educational status, and marital status; types of caesarean section; indications for caesarean section and management outcome.

Data were coded and analysed using International Business Machine, Statistical Product and Service Solutions (SPSS), version 25.0 Armonk, New York. Categorical variables were summarized in frequencies and percentages while continuous variables were summarized using mean and standard deviations with 95% confidence intervals around the point

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estimates. Results were presented in Figures and Tables as appropriate to the data. Ethical clearance for the study was obtained from Research Committee.

3. RESULTS

Over the review period, there were one hundred and thirteen thousand, five hundred and sixteen (13,516) deliveries and five thousand, five hundred and ninety-eight (5598) cases of caesarean sections, giving the prevalence of caesarean section in RSUTH as 41.4% or 414 per 1000 deliveries. The rate of caesarean section decreased from 47.3% in 2015 to 32.4% in 2016, and increased from 38.4 in 2017 to 53.0% in 2019 (Table 1).

Table 1. Yearly distribution of caesarean section in RSUTH)

Year	Number of Caesarean sections	Total number of deliveries	CS Rate (%)
2015	1156	3020	47.3
2016	1136	3495	32.4
2017	1054	2747	38.4
2018	1192	2294	52.0
2019	1060	1960	53.0
Total	**5598**	**13,516**	**41.4**

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Table 2, shows the sociodemographic and obstetrics characteristics of the study participants. The mean age of study participants was 32.30 SD 1.04, 95% CI:30.26,34.34; range 15 -48 years. The modal age group was 35-39 years, accounting for 31.2 % followed by those aged 30-34 years (25%) and those aged 45 and above were the least (2.7%). Majority of the participants were multipara [3,450 (61.6%)], married [4890 (87.4%)], Christians [5581 (99.7%)] and had tertiary level education [2830 (50.6%)].

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Table 2. Sociodemographic and obstetric characteristics of participants

Variable	Number (N=5598)	Percentage
Age		
15-19	350	6.3
20-24	725	13.0
25-29	878	15.7
30-34	1400	25.0
35-39	1750	31.2
40-44	345	6.1
45-49	150	2.7
Mean age	SD*	95% CI#
32.30	1.04	30.26,34.34
Parity		
0	793	14.2
1	1025	18.3
2	1950	34.8
3	450	8.0
4	1050	18.8
≥5	330	5.9
Educational status		
Non formal	18	0.3
Primary	650	11.6

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Secondary	2100	37.5
Tertiary	2830	50.6
Marital Status		
Married	4890	87.4
Single	708	12.6
Religion		
Christianity	5581	99.7
Moslems	10	0.2
Others	7	0.1

**Standard deviation # CI 95% Confidence interval*

One thousand eight hundred and ninety-two (34%) of the participants were business women while civil servants and house wives accounted for [1550 (28%)] and [910 (16%)] respectively (Figure 1).
Four thousand, three hundred and thirty -six (77.5%) women were booked while one thousand two hundred and sixty-two (22.5%) were unbooked (Figure 2).
Figure 3, shows the distribution of emergency and elective caesarean sections. Cases of emergency caesarean section were more than those of elective caesarean section.

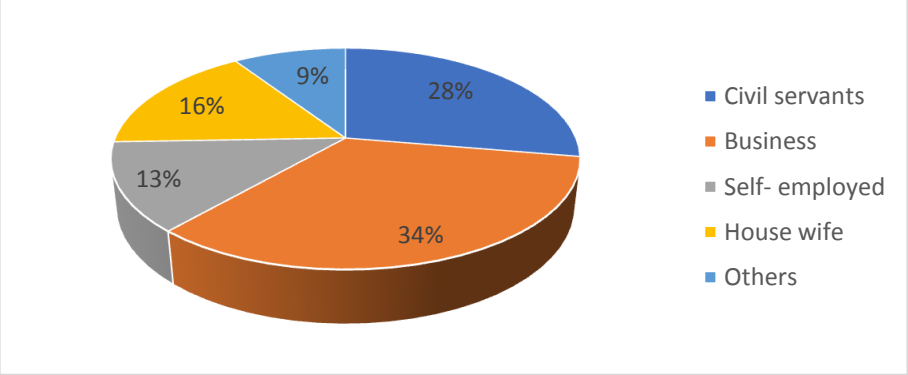


Figure 1. Participants' Occupation

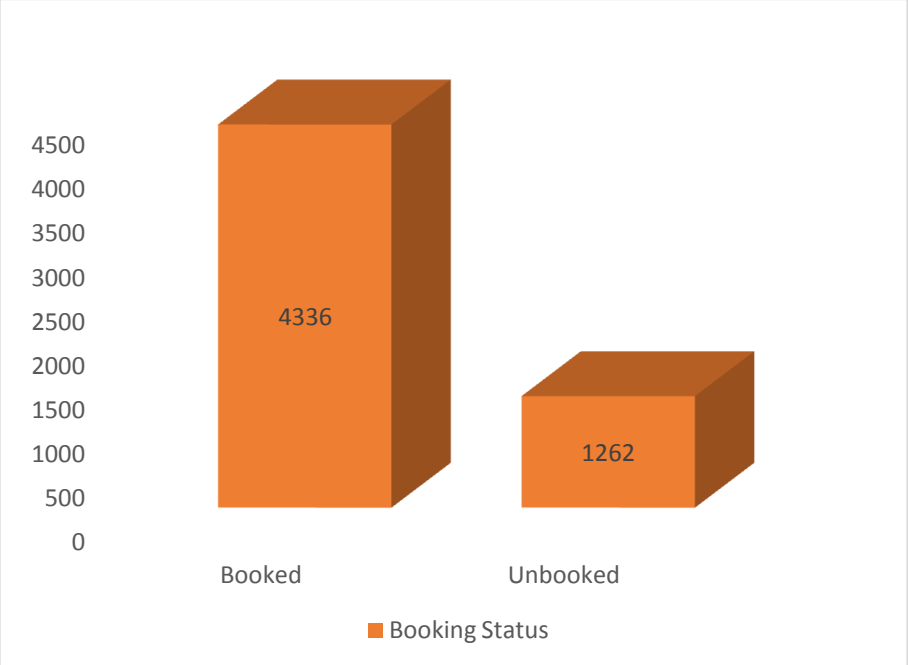
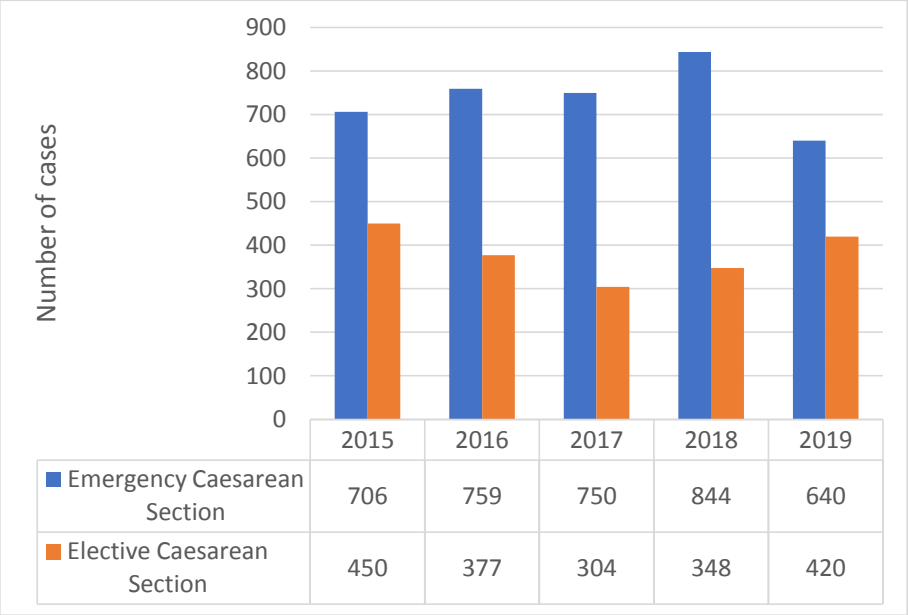


Figure 2. Booking status of women that had CS in RSUTH.



	2015	2016	2017	2018	2019
Emergency Caesarean Section	706	759	750	844	640
Elective Caesarean Section	450	377	304	348	420

Figure 3. Types of Caesarean section

Table 3, shows the indications for caesarean section in RSUTH. The commonest indication for CS was previous caesarean section [1925 (34.1%)], followed by cephalopelvic disproportion [757 (13.4%)], foetal distress [418 (7.4%)], preeclampsia [390 (6.9 %)] and multiple pregnancy (twins with abnormal presentation of leading twin and higher order pregnancies) [252 (4.5%)]. Others are as presented in Table 3.

Table 3: Indications for caesarean section in RSUTH.

Indications	**Number (N=5649)** [#]	**Percentage**
Abnormal lie	240	4.25
Cephalopelvic disproportion	757	13.40
Foetal distress	418	7.40
Foetal macrosomia (birth weight ≥4.0kg)	162	2.87
Hand /cord prolapse	45	0.80
Retained second twin	15	0.27
Previous caesarean section	1925	34.08
Failed induction of labour	156	2.76
Obstructed labour	212	3.75
Prolonged pregnancy	118	2.09
Preeclampsia	390	6.90
Eclampsia	98	1.73
Antepartum haemorrhage	173	3.06
Previous myomectomy	114	2.02
Multiple pregnancy	252	4.46
Assisted Reproductive Technology (ART)	9	0.16
Mother's request	10	0.18
PROM*/severe oligohydramnios	94	1.66
Sickle cell disease	7	0.12
Teenage pregnancy	5	0.10
Prolonged labour	62	1.10
Co-existing uterine fibroid	129	2.28
Bad obstetric history	14	0.25
Ruptured uterus	43	0.76
PMTCT HIV**	99	1.75
Gestational/ diabetes mellitus	47	0.83
Poor progress of labour	39	0.69
Cervical dystocia/stasis	16	0.28

*# Multiple indications *Premature rupture of foetal membranes*
***Prevention of Mother to Child Transmission of Human immunodeficiency Virus*

4. DISCUSSION

Over all, the prevalence of caesarean section in RSUTH was 41.4% or 414 per 1000 deliveries. This CS rate is higher than reported rates of 30.3% [15], 28.6% [16] in Nigeria, 38.3% in Ethiopia [17], 26.9% in Ghana [18] and 21.4% in Pakistan [6], but same as 41.4% reported by Gao et al in China [19]. However, the total number of cases of CS and deliveries in our study was quite higher compared to previous studies. The high rate of caesarean section in this study may be due to increased number of cases of previous caesarean sections and cephalopelvic disproportion managed during the period of review. Additionally, our hospital as a tertiary health facility in the state, receives referrals from other categories of health facilities as well as private hospitals (in particular, patients that cannot pay 'out of pocket') within and from neighbouring states. This could account for the

increased rate of CS observed in present study. The number of referral cases from other peripheral health facilities to the tertiary hospitals especially in low-medium- income countries is known to increase their CS rates [2, 7, 20].

In recent times, management outcomes of high risk pregnancies and caesarean sections have been safe due to availability of blood transfusion services [21], antibiotics, improved specialized obstetric and anaesthetic practice amongst other factors [2, 22]. The safety of the procedure could influence patient's choice of delivery mode. Fear of litigation in obstetric practice, declining skills for assisted vaginal delivery and maternal request for CS has been attributed to the increasing rate of CS [1, 2]. Though in present study only 0.2% of the study population had CS based on their request in the absence of any obstetric indication.

The rate of CS in present study is quite higher than 10% recommended by WHO as the limit above which, there is no associated reduction in foeto-maternal morbidity and mortality [9]. The initial reference range of 10-15% given by WHO working group was reported for 'population' defined by different geographical boundaries [9]; often, it has been erroneously used as a measure for health facility. As such, should be interpreted with caution in a health facility-based study. More so, the authors (WHO working group) reported that data on association between CS rate and still birth, maternal, perinatal outcomes could not be determined due to lack of data [3, 11]. Nevertheless, measures targeted at reducing the rate of caesarean section would be helpful for improved obstetric care since CS has a higher risk of maternal morbidity and mortality compared to vaginal delivery.

Although the rate of caesarean section decreased from 47.3% in 2015 to 32.4% in 2016, an increasing trend was observed such that the rate increased from 38.4% in 2017 to 53% in 2019 (14.6% increase). This finding is consistent with the findings of other previous studies [22-24]; and has been attributed to improved technology, innovation, safe surgical and anaesthetic techniques as well as women's preferences [7]. Also, our finding is in keeping with that of Betran and colleagues who reported an increasing trend in all regions of the world [5]. Overall, the yearly rates of emergency CS outnumbered planned caesarean sections, in keeping with previous studies [7, 20, 25].

The mean age of the women was 32.30 SD 1.04 years with modal age group being 35-39 years. This is comparable to finding of previous studies in Nigeria [7] and in Ghana [18]. More than half of the women in our study were multi-paras and aged 35 years and above. Women in this age group are likely to be multiparas, with co-existing medical complications in pregnancy; as such at risk for operative delivery. Majority (99.7%) of the study population were Christians. This is not surprising since the most common religion in the study area is Christianity. Majority of the study participants had tertiary level education, in keeping with previous study [17].

Over 75% of the women in this study, were booked patients. Our finding is in keeping with those of other studies in Tertiary Health Centre [16, 26] but contrary to the finding of higher rates of CS among unbooked mothers in other similar studies in Nigeria [22, 27]. The higher rate found among booked patients is not surprising because majority of the participants had previous history of caesarean section, and had to register their pregnancies in the hospital for better care. Also, cases of CS referred from private, primary and secondary health facilities were classified as booked patients. This could account for increased number of booked patients compared to unbooked in our study.

In present study, previous caesarean section was the commonest indication for caesarean section, accounting for 34% of the total cases of CS carried out over the review period. This finding corroborates those of previous studies [6, 18, 26-28], but contrary to the finding of

other studies in Nigeria, where cephalopelvic disproportion was reported as the commonest indication for caesarean section [16, 22, 29]. From our study, the second most common indication for CS was cephalopelvic disproportion (CPD). Mothers with small pelvises as a result of childhood malnutrition, and carrying big babies are at risk for cephalopelvic or foeto-pelvic disproportion leading to abdominal delivery. This has been one of the major explanations to the predominance of CPD as an indication for CS in low-medium -income countries. The study also revealed that the first ten most common indications for CS in decreasing order of occurrence were previous caesarean sections, cephalopelvic disproportion, foetal distress, preeclampsia, multiple pregnancy, abnormal lie, obstructed labour, antepartum haemorrhage, foetal macrosomia, and failed induction of labour.

5. CONCLUSION

The rate of caesarean section is high with an increasing trend in RSUTH. The common indications for CS are previous CS, cephalopelvic disproportion, fetal distress, preeclampsia/eclampsia and multiple pregnancy with associated obstetrics complication. Measures targeted at reducing primary caesarean section in our population would be helpful in reducing the high rate of caesarean sections. Thus, efforts should be made to reduce CS rate to the level recommended by WHO for 'population' especially in low-middle-income countries (LMICs), where there is high aversion to CS.

CONSENT

Not applicable

ETHICAL APPROVAL

As per international or institutional standard ethical approval has been collected and preserved by the authors

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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