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■ Original Research Article

A Five-Year Review of Caesarean Sections at the Central Hospital Agbor, Delta State, South South Nigeria.

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ABSTRACT

Background: Caesarean section (CS) is the most commonly performed Obstetric surgery. The rate has been observed to vary from centre to centre. **Aim:** The aim of the study was to reviewed the CS done at the Central Hospital Agbor (CHA) to document the rate, type (emergency or elective) and indications. **Subjects and methods:** This was a retrospective study involving the reviewed of Two thousand six hundred and seven (2,607) cases of CS (1229 emergency, 1378 elective) managed at the CHA, Delta state from 1st January, 2019 to 31st December, 2023. Data collected were analysed using statistical package for social sciences (SPSS) computer software version 25.0 for windows. **Results:** The total delivery within the period was 5951 with 2607 delivered through CS giving a CS rate of 43.8%. Elective CS was done for 1378 (52.9%) while Emergency CS was done for 1229 (47.1%). The commonest indications were Repeat CS (17.0%), 2 Previous CS (13.7), Fetal distress (9.4%) and Breech (8.0%). The average age of parturient was 30.38 ± 5.34 years while the minimum and maximum ages were 16 and 50 years respectively. The modal age was 30 years. Among the patients that had CS, 37 (1.42%) were teenagers. **Conclusion:** The CS rate at CHA is high, with repeat CS being the most prevalent indication. Efforts should be directed towards optimizing the CS rate while maintaining the utmost priority on maternal safety and fetal well-being, leveraging evidence-based practices to minimize unnecessary CS procedures.

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INTRODUCTION

When vaginal delivery is not a viable option, CS is a lifesaving intervention that prevents fetal and maternal morbidities and mortality. CS is defined as the surgical delivery of one or more fetuses, placenta, and membranes through an abdominal and uterine incision after the age of viability.[1] The indications for CS can be categorized into maternal or fetal reasons, and the procedure can be performed as an emergency or elective surgery, depending on the underlying indication and clinical scenario.

The global rate of CS is steadily increasing due to various factors, including advancements in anesthesia, availability of blood transfusions and antibiotics, which have improved the safety of the procedure.[2] Additionally, the decline in operative vaginal deliveries and vaginal

breech deliveries, fear of litigation in obstetric practice, identification of high-risk mothers, and the growing trend of repeat CS in women with previous CS deliveries have all contributed to the rising incidence of CS as a preferred option for delivery.[2]

World Health Organization (WHO) considers CS rate of 5-15% to be optimal range.[3] Lower rate could suggest unmet needs of the patients while higher rate indicates improper selection at times.[4,5] The CS prevalence vary from one country to another with 32% reported in USA, 25% reported in UK, 16-36.4% in China, 25.4% in India, and 35.4% in Latin America.[3,6,7,8,9.] On the other hand, the incidence is about 20 to 30% in most teaching hospitals in Nigeria.[10] Ugwu et al[11] at Enugu reported CS rate of 27.6% while Ismail et al[12] and Wekere et al[13] in Ibadan and Port Harcourt respectively reported 20.4% and 41.4% CS rates. The commonest indications for CS in these institutional studies were two previous CS, repeat CS, cephalopelvic disproportion (CPD), fetal distress, hypertension in pregnancy and obstructed labour.

At the CHA where this review was conducted, Antenatal care (ANC) and delivery including CS is free. The high cost of CS has been documented as a reason for women rejecting CS especially in settings without functional health insurance schemes.[14-17] This is expected in a country like Nigeria where the absolute poverty headcount ratio stands at 40.1%.[18]

With the cost of delivery and CS mitigated, it is anticipated that the acceptance of CS as an option of delivery will be high among the study population, hence the need to document the rate and common indications for CS in this region. We hope that the findings from this review will assist in strengthening planning and formulation of health policy to ensure that the free health program is sustained.

SUBJECTS AND METHODS

This was a retrospective study of all CS carried out at the CHA, Delta State Nigeria from January 2019 to December 2023. The hospital was established in the year 1906. It is a 250-bedded hospital located in the South–South region of Nigeria. It provides general medical care and specialist services to indigenes of Delta State and neighboring parts of Edo State. The Obstetrics and Gynaecology department has two consultants who are fellows of the National Postgraduate Medical College of Nigeria and the West African College of Surgeons. Training of medical officers and interns' forms part of the activities of the hospital. The hospital attracts a monthly antenatal booking of over two hundred women, and the delivery rate in the past 5 years has been approximately 1100/year. The postnatal clinic attends to about fifty women per week. Agbor is a kingdom in Delta State, Nigeria, occupying a part which has boundary with Edo State. The people of Agbor town are Ika and they speak the Ika dialect of the Igbo language. Agbor has a population of about 67,000 people who are predominantly Christians of different denominations. Some of the indigenes practice African traditional religion, and there are a few migrant Hausa/Fulani Muslims. The main occupational activities of the indigenes of Agbor town are farming and trading

In November 2007, the Delta State Government launched a comprehensive free maternal and child health program, which has been continuously sustained by successive governments to date. This initiative encompasses the full spectrum of maternal care, including antenatal care, delivery (including CS), postpartum, and postnatal care up to six weeks after delivery, as well as provision of essential drugs, supplies, laboratory investigations, and surgical management of ruptured ectopic pregnancy and blood transfusion. This program has been a vital component of the state's healthcare strategy, ensuring that pregnant women and new mothers have access to quality care, regardless of their financial situation.

The Obstetric theatre register and labour ward delivery records were reviewed to identify patients who underwent CS during the study period. In our centre, parameters recorded in the labour ward delivery register includes patients' demographic data, date, parity, gestational age, indications for CS, type of CS, Apgar scores, single or multiple gestation, birth weight, state of baby and mother following the CS up to time of discharge. While the labour ward theatre register documents age, parity, indication for CS, type of CS, time and duration of surgery, anaesthetic technique, cadre of Anaesthetist, Surgeon and Assistant and major intraoperative complications. Where data was found to be incomplete in one record, the other record was used to complement. This approach helped to reduce missing information. The above information was retrieved from the records using a "data extraction" form developed for this purpose and subsequently keyed into the statistical package for social sciences (SPSS) computer software version 25.0 for windows. The results were analysed using descriptive statistical methods. Ethical clearance was granted by the Ethical and Research Committee of CHA. Confidentiality of patients' records was maintained as collected data were entered and kept in a password-protected computer.

RESULTS

Over the five-year review period, the total number of deliveries was 5,951 with 2607 delivered through CS giving overall CS rate of 43.8%. Emergency CS was 47.1% while Elective CS was 52.9%. The average age of

parturient was 30.38 ± 5.34 years while the minimum and maximum ages were 16 and 50 years respectively. The modal age was 30 years. Among the patients that had CS, 37 (1.42%) were teenagers. Multiparaous women were the majority comprising 1735 (66.5%) of the total population. Nulliparous women and Grand multiparous women comprised 808 (31.0%) and 64 (2.46%) respectively (Table I).

Table I: Age and Parity Distribution of the Parturients.

Age	Nö (2606)	%
< 20	37	1.42
20 - 29	1083	41.56
30-39	1376	52.76
≥40	111	4.26
Parity		
Nullipara	808	31.00
Multipara	1735	66.53
Grandmultipara	64	2.46

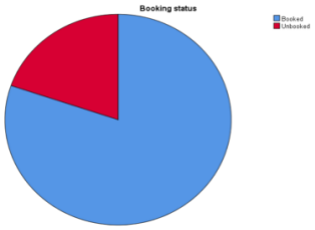

Figure I: Pie chart of the booking status of the paturients

Majority of the patients (80.9%) who had CS under the period were booked in our facility. Fig I. Table II shows the yearly delivery and the corresponding number of CS done during the period.

Table II: Yearly Caesarean Section rates

Year	No of CS	Total No of Deliveries	CS rate
2019	432	1234	35.0%
2020	537	1090	49.3%
2021	560	1225	45.7%
2022	547	1208	45.3 %
2023	531	1194	44.5%
Total	2607	5951	43.8%

The lowest CS rate was in the year 2019 (35.0%) with a surge in 2020 (49.2%). In the preceding three years, the rate remained steady with very mild decrease (Table II). Elective CS was done for 1380 (52.9%) of the participant while 1227(47.1%) had emergency CS (Fig II).

Fig II: Bar chart of the type of CS

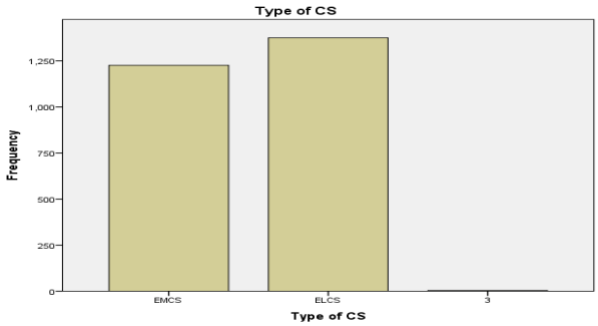

Fig II: Bar chart of the type of CS

The commonest indication for CS was repeat CS (with other morbidities) (17.0%) while two previous CS, fetal distress, Breech, CPD and hypertensive disease in pregnancy made up 13.7%, 9.4%, 8.0%, 7.5% and 6.7% respectively of the indications for CS. Table III.

Table III: Indications for CS

Indication	Frequency	Percentage
Repeat CS	443	17.0
2 previous CS	357	13.7
Fetal distress	245	9.4
Breech	209	8.0
CPD	195	7.5
PIH	175	6.7
Macrosomia	161	6.2
Obstructed Labour	117	4.5
Placenta praevia	117	4.5
Twin gestation	103	4.0
Abnormal lie	60	2.3
Oligohydramnios	60	2.3
Failed induction	55	2.1
3 previous CS	54	2.1
Fibroid in pregnancy	52	2.0
Abruptio placentae	26	1.0
Maternal request	22	0.8
Others	156	5.9

During the review period, there were 5739 singleton deliveries, with 2607 delivered via CS. Additionally, there were 207 twin deliveries, with 128 delivered via CS, and 5 triplet deliveries. The twin gestation rate was 3.5%. A total of 24 maternal deaths were recorded during the study period with 15 of the death occurring following CS giving a case fatality rate of 0.58%. There were 338 perinatal deaths with 73 of them occurring among the CS group.

DISCUSSION

The overall CS rate in the study was 43.8% which was higher that the WHO recommendation of 5-15% but it is similar to the 41.4% rate recorded at River State University Teaching Hospital by Wekere et al.[13] Slightly lower rates of 34.8%, 35.3%, 34.6%, and 34.7% were reported by Momah et al in Abakiliki[19], Adekule in Oshogbo[20] Akinwutan in Ibadan[21] and Ezechi et al [22] in lagos respectively. Lower rates of 19.3%, 21.4%, 10.1%, 11.8 % and 17.7% have been reported in Markudi[23], Abuja[2] Kano[24], Maiduguri[25], and Jigawa[26] respectively. The high rate of CS reported in our facility is not surprising considering the fact that the centre operates a free antenatal care and delivery program that caters for pregnant women from conception to six weeks after delivery with CS inclusive. A previous review of acceptance of CS in the centre by Maduka et al[27] showed that 91.1% of participants were willing to accept CS if suggested by the Doctor. The cost of CS has been documented as a militating factor in women's decision of choice of mode of delivery with rate of rejection of up to 23.5% due to financial constraint documented in some studies.[15-17]

This review reveals that repeat CS was the predominant indication, frequently resulting from rapid repeat pregnancy following previous CS, thereby rendering vaginal delivery contraindicated due to increased risk of uterine rupture and maternal-fetal complications. The high incidence of primary and repeat CS contributes to a substantial number of women presenting with two previous CS, which perpetuates the contraindication for vaginal delivery. The underlying etiology of the high fertility rate may be attributable to the unmet need for effective contraception in this population, underscoring the necessity for enhanced access to family planning services and contraceptive counseling to mitigate the risks associated with repeat CS and promote safer reproductive outcomes.

The hospital serves as a major referral centre to many government and private facilities including traditional birth attendants and faith-based facilities. Obstructed labour and other obstetric emergencies were the common cases sent in from these centres and usually after mismanagement. Suspected fetal macrosomia was the indication for CS in 6.2% while CPD and obstructed labour were the indications for CS in 7.5% and 4.5% respectively. This could be attributed to inadequate pelvic development from malnutrition which is common in rural Nigeria[28] and a relatively high incidence of teenage pregnancy which accounted for 1.42% of the women population that had CS.

Foetal distress was the indication for CS in 245 (9.4%) of the patients which is similar to the findings in some previous reviews[13,19,29]. The finding is lower than 19.2% and 23.6% reported by Isa et al[2] and Ugwu et al.[11] The facility uses sonicaid for fetal monitoring and employs the use of cardiotocogram (CTG) in high-risk cases. The diagnosis of fetal distress is susceptible to interobserver variability, contingent upon the healthcare provider's level of expertise and training. False positive result indicating fetal distress when none exists, leading to unnecessary interventions like forceps or cesarean deliveries has been associated with use of CTG in labour monitoring.[30] This underscores the imperative for standardized diagnostic criteria, objective assessment metrics, and rigorous adherence to evidence-based guidelines to ensure the accurate identification and management of true fetal distress cases, thereby mitigating the risk of iatrogenic interventions and optimizing maternal-foetal outcomes. To minimize the likelihood of false positive interpretations of the CTG machine and other labor ward equipment, we recommend providing comprehensive training for new labour ward staff members and refresher training for existing staff. This education should focus on enhancing their understanding of CTG trace interpretation, proper usage of labor ward gadgets, and adherence to established protocols. It is expected that this will improve the accuracy of fetal monitoring and reduce the risk of unnecessary interventions.

In the context of free antenatal care and delivery, advanced maternal age at first childbirth, and high rates of infertility, maternal request is becoming a significant reason for CS. Although only 0.8% of CS procedures were performed due to maternal request, a previous study by Maduka et al[27] found that 1.7% of pregnant women at the same center expressed a preference for CS as their mode of delivery, indicating a growing trend towards maternal request as an indication for CS.

Despite the increasing trend in CS, implementing measures to reduce the rate of CS is crucial for enhancing obstetric care, as CS carries a higher risk of maternal morbidity and mortality compared to vaginal delivery.[31] Reducing unnecessary CS can lead to better health outcomes for mothers and babies. Primary CS is a harbinger for more CS in the future with repeat CS and two previous CS being the two leading indications for CS as reflected in this review. Therefore, every effort should be made to reduce the rate of primary CS. Training of healthcare professionals in appropriate labor management, labor monitoring, and recognition of abnormal labor progress using simple tools like the partograph can help in identifying abnormal labour and the early institution of interventions like oxytocin augmentation, artificial rupture of membrane and appropriate referral for better intervention in higher centres.

Proficiency in assisted breech delivery and instrumental vaginal deliveries should be considered an

essential competency for labor ward midwives and medical officers, as it is a fundamental skill necessary to ensure safe and effective management of labor and delivery. Careful patient selection for a trial of vaginal delivery is critical in reducing the CS rate while maintaining a safe intrapartum environment, as it allows healthcare providers to identify women with a low risk of complications and favorable reproductive and fetal characteristics, thereby optimizing the likelihood of a successful vaginal delivery and minimizing the risks of maternal and fetal morbidity and mortality associated with unnecessary CS.

Majority of patients in our review had Elective CS. This is in contrast to some other previous studies.[2,4,11,12,13,19,29] Repeat CS and 2 previous CS which are usually done as elective CS were the two leading indications in our review. The provision of free antenatal care and delivery has led to a significant increase in antenatal booking, facility-based deliveries, and uptake of CS. By alleviating the financial burden, this initiative has improved access to obstetric care, resulting in a higher acceptance of CS as a mode of delivery, particularly among women from lower socioeconomic backgrounds, who previously may have faced barriers in accessing this life-saving intervention.

The mean age was 30 SD 5.34 years with a modal age of 30 years. This is similar to other previous studies.[13,19,29] More than half of the patients were in the multiparous group. Many of them would have had one or more CS in the past and other coexisting morbidities like hypertension and diabetes contraindicating vaginal delivery.

The average birth weight was 3.05 SD 0.56kg. Singleton, twins and triplet deliveries were 2458, 128 and 5 respectively. There were 24 maternal deaths with 15 occurring following CS with a case fatality rate of 0.58%.

Strength and limitations: The study is the first CS review coming from this centre. It serves as a clinical audit and has also laid the foundation for further reviews in the near future. The free antenatal care program in the centre made the study unique as it enables all strata in the socioeconomic class to deliver in the facility hence enriching the findings from the study. However, despite the fact that ANC program was free, the study remains a facility study and hence the findings cannot be generalized. Record keeping was poor. The authors had to compliment data from multiple sources to ameliorate the problem of missing values. Therefore, the possibility of not capturing some few cases cannot be ruled out.

CONCLUSION

The current rate of caesarean section in the hospital is high and if unchecked, the rate might escalate to an unacceptable level. In an effort to curb the rising trend of repeat cesarean deliveries, carefully selected patients should be offered the option of vaginal birth after CS (VBAC), promoting a more personalized and informed approach to childbirth. Training of labour ward nurses and midwives and the medical officers on the conduct of assisted breech delivery and instrumental delivery will help ameliorate high CS rate in the centre. There is need to complement clinical diagnosis of macrosomia with ultrasound finding to decrease the rate of false diagnosis and subsequent unnecessary CS. However, while trying to minimize the CS rate, it should be undertaken when medically necessary. Rather than striving to achieve a specific rate, efforts should focus on providing caesarean section to all women in need. How to define the woman 'in need' can only be ascertained by the health care providers caring for the woman on a case-by-case basis.

We anticipate that the results of this review will inform policy decisions in the Delta State health sector, specifically regarding the free health program, enabling policymakers to develop evidence-based policies that enhance the program's effectiveness, sustainability, and resource allocation. By leveraging the findings of this review, policymakers can optimize the program's impact, address existing gaps, and maximize the utilization of available resources, ultimately leading to improved health outcomes for the population.

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